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Occupational Health and Rehabilitation

New Approaches for Maintaining Work Ability in the Workplace

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Message of Greeting

Work is important to people's well-being as it gives them a sense of structure and identity. Rehabilitation International's overwhelming priority is to safeguard the well-being of our members, their families and the wider communities in which we operate and serve. In today's volatile work market, we are aware that each day is bringing significant challenges and pressures to the members of our global family. Social and economic disruptions are impacting communities and families in all corners of the globe while disproportionately impacting the disability community and people with special health challenges as these are the most vulnerable groups worldwide.

This publication focuses on new and innovative approaches on how to maintain work ability in the workplace from the perspectives of occupational health and rehabilitation. The two institutions, namely, the Norwegian National Advisory Unit on Occupational Rehabilitation (Norway) and the FOM University of Applied Sciences (Germany), were instrumental in initiating this research output.

This publication contains both theoretical and practical guidance from quantitative and qualitative research experts in the fields of occupational health and rehabilitation from Austria, Germany, Iceland, Norway, the United Kingdom and the United States. This publication will respond to the needs of clinicians, workplace managers, organizational psychologists, researchers, and those teaching or studying within the fields of occupational health and rehabilitation, including those taking a special interest in work, health and disability management.

The publication is characterized by its multidisciplinary focus and its international contributions addressing both an academic and a non-academic audience.

I would like to thank all contributing authors for the achievement of this collaborating project, hoping this publication will be an inspiration to further our knowledge and to create sustainable workplaces for all.

September 2020

Teuta Rexhepi
Secretary General
Rehabilitation International
New York USA

Preface

This book addresses new approaches in occupational health and rehabilitation for maintaining work ability in the workplace. The contributions in this book constitute further developments of presentations held by researchers and clinicians from Europe and the USA during a series of international research seminars on "Mental health, occupational rehabilitation and behavioral economics", organized by the Norwegian National Advisory Unit on Occupational Rehabilitation, Rauland, Norway and the Competence Center of Interdisciplinary Economic Research and Behavioral Economics (KCI), at the FOM University of Applied Sciences, Essen, Germany. The presentations were held at the FOM in 2015 and 2016 in Frankfurt am Main and Munich, Germany, respectively. The series continued in 2019 at the Rehaklinik Bellikon (Switzerland). The major findings of the seminar series are reported and further discussed in this book.

The book is divided into four sections evaluating and providing quantitative, qualitative and theoretical findings within work ability and work disability, return to work, work and health and work and innovation. The authors have applied methodologies and approaches from health and human sciences as well as economics and business. It offers new perspectives by combining knowledge from different fields, which traditionally have been separated in research and practice. Therefore, this book covers on the one hand essential themes in occupational and vocational rehabilitation and, on the other hand, a different view and perspective on occupational health and rehabilitation research. The new challenges of the twenty-first century need new approaches for learning throughout the health sector. Knowledge translation has become a crucial focus point of each country's efforts to strengthen and improve its health and rehabilitation systems. The rationale for this book is based on the belief that learning and sharing knowledge across countries and from different populations seems essential. This will pave the way for new ideas and approaches for maintaining work ability in the workplace and enhance return to work and occupational health after sickness absence, or where individuals face challenges entering or remaining in the labor market. The book concludes by encouraging future

research to build alliances across countries, research fields and methodologies to gain further knowledge and opportunities that improve sustainable labor market participation.

Today, research on occupational health, rehabilitation and labor market participation is closely intertwined within the social security systems, that is, incentives in the system seem to play a major role regarding whether individuals remain in work, for example on a part time basis or where sickness absentees return to work. Labor market participation and return to work are often influenced by factors, not only at the social security level, but also at the environmental level in workplaces and home settings as well as at the personal and subjective levels. Therefore, adapting a broader stakeholder approach appears sensible, and this book contributes with new knowledge and offers new solutions to this field. The areas covered in this book elucidate both from a clinical and research perspective, the impact a multi stakeholder approach will have on the efforts to contribute to sustainable labor market participation. The book therefore highlights solutions and theoretical knowledge related to work and health, work functioning, healthy workplaces, labor market participation for vulnerable groups and knowledge transfer between research and practice, all being closely associated with work ability in the workplace.

This book is targeted at clinicians and practitioners in the fields of occupational health and rehabilitation, academic researchers including teaching institutions and students in the areas of work and health. Also, it will be of interest to workplace managers and civil servants responsible for legislation. The way forward is to collaborate within and across stakeholders, even across countries, to increase our knowledge on how to keep an active labor force and to include and return individuals who fall out of the labor market. This requires the creation of healthy communities and healthy workplaces to boost work ability; an effort which depends on continuous multi stakeholder involvement focusing on individuals' needs and evidence-based interventions.

We, the editors, would like to take the opportunity to express our gratitude to all authors who shared their expertise by contributing their chapters to this book and all the people who have supported the seminar series and this project. We also want to thank the Norwegian National Advisory Unit on Occupational Rehabilitation and the FOM University of Applied Sciences for supporting the international research collaboration on occupational health and rehabilitation and behavioral economics. Financial support of the seminar series by the Norwegian National Advisory Unit on Occupational Rehabilitation (Norway), the FOM University of Applied Sciences (Germany), and the Rehaklinik Bellikon (Switzerland) as well as continuous support and innovative practice by Dr. Christoph Reimertz (Head of the Service- and Rehabilitation Center at the Berufsgenossenschaftliche Unfallklinik Frankfurt am Main, Germany) and Dr. Ingmar Schenk (Psychiatrie-Dienste Süd, Psychiatrie-Zentrum Linthgebiet, Switzerland) is gratefully acknowledged. Special thanks go to Prof. Dr. Udo Kischka and Prof. Dr. Helen Dawes for providing inspiring discussions and research opportunities at the Oxford Centre for Enablement (OCE) on the Nuffield Orthopaedic Centre (NOC) site

(Oxford University Hospitals) in Oxford, where—for the editors—this line of applied research started many years ago. For the publishing of this book we would like to thank the FOM's publishing department, Angela Meffert, Nirmal Iyer and the Springer Publishing house for their excellent service and cooperation.

Rauland
and Frankfurt am Main
February 2021

Dr. Thomas Johansen
Prof. Dr. Winand H. Dittrich

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Editors and Contributors

About the Editors

Thomas Johansen is a doctor of psychology and a senior researcher at the Norwegian National Advisory Unit on Occupational Rehabilitation, Rauland, Norway. His research includes cognitive psychology and occupational rehabilitation focusing on cognitive and emotional functioning, work ability, work functioning, return to work self-efficacy and return to work measures. Other research interests include the brain-behavioral relationship in anxiety and depression, the integration between cognition and emotion, work-focused cognitive behavioral therapy and the application of knowledge transfer and exchange principles in the research process. His work has been published in internationally peer-reviewed journals such as *Frontiers in Psychology, Scandinavian Journal of Psychology, Journal of Occupational Rehabilitation* and *Scandinavian Journal of Occupational Therapy*. In addition, he writes popular articles and gives lectures on occupational rehabilitation and work and health. He is the local representative of the Norwegian Association of Researchers at the Norwegian National Advisory Unit on Occupational Rehabilitation. Thomas Johansen is a review editor of the journal *Frontiers in Psychology* in the section *Cognition.* He completed his Ph.D. in Psychology at the University of Hertfordshire in the UK.

Winand H. Dittrich is a professor of international management, especially behavioral economics, and director of the Competence Center of Interdisciplinary Economic Research and Behavioral Economics (KCI) at FOM University of Applied Sciences, Frankfurt am Main, Germany. His research interests include applied social cognition, executive assessment and development, comparative cultural studies and behavioral economics in international management. He has a long track record of working in different fields such as comparative psychology, cognitive neurosciences, social cognition and behavioral economics where his publications are internationally recognized. His work has been published in these different areas in internationally recognized journals. His multidisciplinary expertise as well as his theoretical and innovative contributions

in different settings have been appreciated. Winand H. Dittrich is visiting professor at the Wroclaw University of Economics and Business, Poland, and associate editor of the journal *Disability, Rehabilitation, and Inclusion* (specialty section of *Frontiers in Rehabilitation Sciences*).

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Introduction

1

Thomas Johansen and Winand H. Dittrich

Abstract

This book offers unique insights into occupational health and rehabilitation by employing both empirical as well as theoretical approaches. It focuses on how to sustain a healthy and productive work environment and on how to keep individuals in work with optimal work ability. Its multidisciplinary focus and its international contributions are of interest both to an academic and non-academic readership. The book opens new possibilities for policymakers, employers, employees, experts and clinicians as well as for researchers and students in the health care and employment sectors. This introduction gives an overview of content and scope of this publication as well as of its structure.

The longer a person is absent from work the more complicated the return to work will be. To increase the chances of return to work among individuals who are unable to work due to health and work issues or disabilities, a careful assessment of their health and workplace conditions, emphasizing physical as well as cognitive and emotional health issues, together with multi- and interdisciplinary rehabilitation and multilevel alliances,

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are understood as essential elements in modern approaches in the health sciences and rehabilitation research and practice—the scope of this book.

The European Commission's target that 75% of people aged 20–64 should be in work by 2020 and beyond, demands increasing efforts to ensure that employees enjoy a workplace that promotes sustainable, healthy and productive working conditions. Sustaining a healthy and productive workplace that promotes optimal work ability in employees with health problems, disabilities or those returning to work after sick leave, is key to meet the EU target. Knowledge about different approaches to increase the likelihood of sustainable labor market participation, and to increase the productivity of employees who are struggling at work, has not been addressed sufficiently. This seems even more important to be addressed from an occupational health and rehabilitation perspective, considering the Covid-19 situation and the added effects on unemployment and participation in working life.

This book emphasizes unique aspects of occupational health and rehabilitation and offers new empirical (quantitative and qualitative) as well as theoretical approaches across a variety of settings. The book opens new possibilities for experts and clinicians as well as for researchers and students in the health care and employment sectors. The multidisciplinary perspectives of leading experts in their fields present key principles of a more holistic occupational health and rehabilitation approach, helping practitioners stay on track and stimulate to innovative approaches through complex terrains.

This book highlights new approaches to examine and evaluate occupational health and rehabilitation approaches enabling health care professionals, policymakers, health and labor economists, HR managers, employers, employees and other stakeholders to support a more productive and sustainable working life. An outline of different approaches across European countries is not available, but needed by national and EU policymakers and other stakeholders. This book will provide valuable knowledge and possibly lead to a common ground, suggesting approaches that seem feasible to embrace in different European countries. This should include personal, environmental and social security system factors related to occupational health and rehabilitation promoting work ability in the workplace.

The knowledge created from the combination of new approaches should be applied as preventive measures in the workplace and during occupational health and rehabilitation interventions aimed at sick-listed patients and individuals struggling to stay in the labor market due to work disability. For example, multidisciplinary occupational and vocational rehabilitation—a key intervention both in Norway, Iceland, Germany, Austria and the USA, and where improvement in work ability and functioning has a strong focus—may benefit from a collaboration across countries in the light of a limited number of studies directly evaluating and documenting the quality and effect of various interventions on work ability in the workplace and return to work.

The book is unique in that it introduces and reviews studies from major disciplines in which rehabilitation is conducted—cognitive neuropsychology, occupational medicine, occupational rehabilitation, social medicine, national labor agencies in different

countries and different international perspectives in the health sciences. It is based on the international collaboration between the Norwegian National Advisory Unit on Occupational Rehabilitation, Norway and the Competence Center of Interdisciplinary Economic Research and Behavioral Economics (KCI), FOM University of Applied Sciences, Germany. The aim of the collaboration is to distribute and transfer knowledge about occupational health and rehabilitation from a cognitive perspective and present new approaches for maintaining work ability in the workplace from various disciplines, as well as focusing on the topic of knowledge transfer and exchange.

This book is divided into four parts covering work ability and work disability, return to work, work and health, and work and innovation. The five chapters in the first part outline how the International Classification of Functioning, Disability and Health (ICF) can be applied as a standardized language in vocational rehabilitation, used in clinical assessments and being part of a broader strategic planning effort in the health care and employment sectors. We are given practical examples from the USA, Iceland and Germany. In an effort to make the ICF tools more clinician and research friendly, we are given an example of a study in which the authors have conducted cross cultural adaptation and validation of the Work Rehabilitation Questionnaire (WORQ) to be used in vocational rehabilitation. In this first part we are also given the theoretical rationale behind the concept of work ability, its usage in assessments and an overview of the rehabilitation system in Austria. In the second part, on return to work, we are provided with two empirical investigations of which the first elucidates facilitators and barriers for return to work in people with disabilities following vocational rehabilitation in Germany, while the second investigation shows that graded return to work after rehabilitation supports sustainable labor participation for individuals on long-term sick leave having chronic conditions. In part three, covering work and health, the authors of the first chapter have conducted a survey looking into factors constituting pathogenic organizations and how to implement best-practice to avoid unhealthy workplaces. In Chap. 10, a non-systematic review of the empirical literature on cognitive functioning and work-related rehabilitation is given to elucidate which cognitive domains are most affected in sick-listed patients in order to inform and improve work-related rehabilitation interventions. The theme of Chap. 11 is implicit motivation and decision-making and the authors direct the reader to interesting and often overlooked factors, namely, the implicit motives of experts, patients and systems that affect individual decision-making and rehabilitation outcomes. The authors of Chap. 12 focus on Germany, and direct the reader to the aspect of introducing high-tech innovations in the workplaces, while at the same time maintaining healthy workers who are already under pressure to perform and be productive. In the final part, work and innovation, the authors of Chap. 13 provide insight into ambulatory assessments, and how they are applied to elucidate real-time assessment of participants' psychological health from an occupational rehabilitation perspective. In the final Chap. 14, the role of innovation and knowledge transfer is highlighted, and forms of knowledge transfer and its role in the health sector are discussed. A traditional model of knowledge transfer is described and adapted to the health sector. Barriers as well as

support systems of knowledge transfer are considered and linked to behavioral economics and rehabilitation.

The integration of cross-national knowledge on occupational health and rehabilitation should provide a more comprehensive understanding of different approaches and how they contribute to maintain work ability in the workplace. This book should inspire further cross-national collaborations aiming to provide a sound basis for knowledge and exchange between research and practice. This new knowledge will make a thorough contribution to a better understanding of factors enhancing occupational health and rehabilitation, and facilitate the development of future interventions. Also facilitated through the development of new research approaches, the demand for evidence-based practice can be achieved by evaluating and assessing the quality and effects of occupational health and rehabilitation interventions, consequently, informing both policies and clinical practices in different countries.

With 14 chapters, written by 23 researchers and clinicians from six countries, this book maintains and carries further the long-standing international research collaboration in the field of Occupational Health and Rehabilitation. The idea behind the book originated during a series of seminars, which took place at the FOM university in Frankfurt, Germany, in 2015 and Munich, Germany, in 2016, and continued 2019 in Bellikon, Switzerland. The chapters in this book represent a further expansion and update of the presentations held during these series of seminars and, furthermore, addresses topical issues and methodological approaches in various research areas of the applied health sciences.

This book will provide a stimulating first base for generating key messages and common indicators in the light of the bio-psycho-social perspective in the health and employment sciences. Workplace, physical, cognitive and emotional interactions need to be considered when enhancing and sustaining work ability in the workplace by allocating a continuous phasing of direct treatment as well as health-related and work-related interventions. Such a comprehensive approach requires that all the relevant medical, therapeutical, social, employment and insurance agencies, either public or non-public, work together and engage in a common approach to occupational health, rehabilitation and return to work. Such a comprehensive approach is highlighted from various, mainly non-medical, perspectives in this book.

Part I

Work Ability and Work Disability

Understanding Functioning and Work Disability Is Essential to Disability Evaluation

2

Reuben Escorpizo, Neil MacKenzie and Christine Richards

Abstract

Work disability is the inability or decreased ability of an individual to work due to illness or injury. It may be associated with personal suffering, decreased functioning, loss of income, increased medical costs, and strained relationships. In order to mitigate and resolve work disability, we must be able to better recognize and define the factors surrounding work. The International Classification of Functioning, Disability and Health (ICF) is a comprehensive classification system that utilizes a bio-psycho-social perspective to identify factors that affect human functioning and health. Integration of the ICF into vocational rehabilitation assessment and intervention will provide a conceptual framework to describe and quantify the impact of disease or injury on an individual. By implementing a standardized language and framework for researchers and clinicians, we can reduce variability of care currently pervasive in vocational rehabilitation practice. Integrating the ICF into vocational rehabilitation assessment and intervention will improve patient outcomes.

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2.1 Introduction

Work disability is the inability or decreased ability of an individual to work due to illness or injury. It has been proposed that work disability may be associated with personal suffering, decreased functioning, loss of income, increased medical costs, and strained personal and social relationships (Escorpizo et al., 2015). Due to these factors, injuries that result in work disability have dire physical, economic, social, and psychological consequences (Baker et al., 2005). In the US, workers earn 15% less (average $31.000) in the ten years post-injury, and the burden of the injured workforce is approximately $74 billion in worker's compensation alone (OSHA, 2015; Seabury et al., 2014; Boden et al., 2005; CDC, 2009).

Work disability is multifactorial in nature. Current research indicates that a multidisciplinary approach is necessary to address a variety of bio-psycho-social factors inhibiting return to work. Li-Tsang et al. (2008) indicated the importance of addressing psycho-social aspects such as coping with stress when working with individuals with musculoskeletal injuries. Similar findings have been observed in patients with the following neurological conditions: traumatic brain injury, stroke, and multiple sclerosis (Escorpizo et al., 2015). Additionally, valid and reliable screening tools are currently lacking in vocational rehabilitation assessment.

In order to mitigate the negative consequences of work disability, we must recognize and define the contributing factors. The International Classification of Functioning, Disability and Health (ICF) is a comprehensive classification system that utilizes a bio-psycho-social perspective to identify factors that can impact human functioning and health. Integration of the ICF in vocational rehabilitation assessment and intervention will provide a conceptual framework to describe and quantify the impact of disease or injury ("vocational rehabilitation" is often used interchangeably with "work rehabilitation" and "occupational rehabilitation"). By implementing a standardized language for researchers and clinicians, we can serve our clients by reducing heterogeneity and variability in practice that is commonly observed in work rehabilitation settings.

2.2 Integrative Bio-Psycho-Social Framework

The ICF is a conceptual framework and classification system developed by the World Health Organization (WHO). The classification system aims to provide a common language for researchers and policy makers in describing and discussing health and disability worldwide (Fayed et al., 2011). The system encompasses many different health-related domains that together present a complete bio-psycho-social picture of health and functioning. The domains of the ICF can be descriptive of both capacity and performance. Capacity is what a person with a certain health condition is capable of doing in a standard environment, and performance is what that person actually does in his or her typical environment (WHO, 2002).

The domains of the ICF are divided into two major groups: those pertaining to body structure and function, and those pertaining to activity and participation. These main components are supported by contextual factors, or variables pertaining to the

environment (environmental factors), or one's person (personal factors) that may affect a health condition or outcome (WHO, 2001).

Within each of the components listed above is a hierarchy of different domains encompassing chapters and second-, third-, and fourth-level categories, each with its own specific alphanumeric code. The component of body functions contains eight chapters (b1–b8), body structure contains eight chapters (s1–s8), activity and participation contains nine chapters (d1–d9), and the environmental factors component contains five chapters (e1–e5) which can be seen in Table 2.1 (WHO, 2001). Each of these chapters can be further broken down into many second-level categories, which in turn are composed of third- and fourth-level categories. In its entirety, the ICF contains more than 1.400 categories that help to describe various components of human functioning and health.

Table 2.1 Components and Chapters of the ICF. (*Source* WHO, 2001)

Body Functions (Chapters b1–b8)	
Chap. 1: Mental functions	Chap. 5: Functions of the digestive, metabolic, and endocrine systems
Chap. 2: Sensory functions and pain	Chap. 6: Genitourinary and reproductive systems
Chap. 3: Voice and speech functions	Chap. 7: Neuromusculoskeletal and movement-related functions
Chap. 4: Functions of the cardiovascular, haematological, immunological, and respiratory systems	Chap. 8: Functions of the skin and related structures
Body Structures (Chapters s1–s8)	
Chap. 1: Structures of the nervous system	Chap. 5: Structures related to the digestive, metabolic, and endocrine systems
Chap. 2: The eye, ear, and related structures	Chap. 6: Structures related to genitourinary and reproductive systems
Chap. 3: Structures involved in voice and speech	Chap. 7: Structures related to movement
Chap. 4: Structures of the cardiovascular, immunological, and respiratory systems	Chap. 8: Skin and related structures
Activities and Participation (Chapters d1–d9)	
Chap. 1: Learning and applying knowledge	Chap. 6: Domestic life
Chap. 2: General tasks and demands	Chap. 7: Interpersonal interactions and relationships
Chap. 3: Communication	Chap. 8: Major life areas
Chap. 4: Mobility	Chap. 9: Community, social, and civic life
Chap. 5: Self-care	
Environmental Factors (Chapters e1–e5)	
Chap. 1: Products and technology	Chap. 4: Attitudes
Chap. 2: Natural environment and human-made changes to environment	Chap. 5: Services, systems, and policies
Chap. 3: Support and relationships	

The ICF is not the only classification system of its kind. In fact, it is complementary to the more known *International Statistical Classification of Diseases and Related Health Problems, 10th Revision,* or ICD-10 (WHO, 2002). Whereas the ICD-10 presents a common "language" and coding for medical diagnoses, the ICF offers the same structure to describe the functioning of people with health conditions. Where the ICD-10 defines the disease or disorder, the ICF describes the ability or disability of a person with that diagnosis (WHO, 2002). Thus, the two classification systems can and should be used together to create a full picture not only of a person's diagnosis, but also of the health and functioning of the person with that diagnosis.

2.3 ICF in Vocational Rehabilitation

In the context of vocational rehabilitation, the ICF can play an important role in providing a common language to aid communication between employers, payers, and healthcare professionals (Finger et al., 2013). In an attempt to standardize work rehabilitation practices for researchers and clinicians, Escorpizo et al. (2011) proposed a conceptual definition based on the ICF: "Vocational rehabilitation is a multi-professional evidence-based approach that is provided in different settings, services, and activities to working age individuals with health-related impairments, limitations, or restrictions with work functioning, and whose primary aim is to optimize work participation." This definition highlights the complexity of vocational rehabilitation, and encompasses the ICF components of body functions and structure, as well as activity and participation.

The breadth of the ICF makes it challenging to practically administer in a research or clinical setting. In order to make the ICF more applicable, the need to create Core Sets became apparent. A Core Set is a short list of ICF categories relevant to a specific health condition or health-related event (including disease) (Stucki et al., 2002). In 2010, Escorpizo et al. developed an ICF-based Core Set to describe the level of functioning and health of participants in vocational rehabilitation programs (Escorpizo et al., 2010). The development of this Core Set gave clinicians the tools necessary to implement the ICF in patient care in a practical and consistent manner.

Both a Comprehensive and a Brief ICF Core Set have been established for work rehabilitation. A Comprehensive ICF Core Set is a condition specific list of ICF categories that is short enough to be practical, but comprehensive enough to be inclusive of typical problems regarding an individual's functioning and health that could potentially be encountered during a multidisciplinary assessment. A Brief ICF Core Set is a list of categories with as few categories as possible to be practical, but enough categories sufficiently comprehensive to describe problems in functioning associated with a specific condition (Cieza et al., 2004). The Comprehensive Core Set for Vocational Rehabilitation contains 90 categories while the Brief Core Set for Vocational Rehabilitation contains 13 categories (ICF). The comprehensive Core Set can be found in Table 2.2 (Escorpizo et al., 2010) (adapted from www.icf-research-branch.org). The Brief Core Set can be seen in Table 2.3 (Escorpizo et al., 2010) (adapted from www.icf-research-branch.org).

Table 2.2 Comprehensive Core Set for Vocational Rehabilitation. (*Source* Escorpizo et al., 2010; adapted from www.icf-research-branch.org)

ICF Code	ICF Category Title	ICF Code	ICF Category Title
Activities and Participation (40)			
d155	Acquiring skills	d445	Hand and arm use
d160	Focusing attention	d450	Walking
d163	Thinking	d455	Moving around
d166	Reading	d465	Moving around using equipment
d170	Writing	d470	Using transportation
d172	Calculating	d475	Driving
d175	Solving problems	d530	Toileting
d177	Making decisions	d540	Dressing
d210	Undertaking a single task	d570	Looking after one's health
d220	Undertaking multiple tasks	d710	Basic interpersonal interactions
d230	Carrying out daily routine	d720	Complex interpersonal interactions
d240	Handling stress and other psychological demands	d740	Formal relationships
d310	Communicating with - receiving - spoken messages	d820	School education
d315	Communicating with - receiving - nonverbal messages	d825	Vocational training
d350	Conversation	d830	Higher education
d360	Using communication devices and techniques	d840	Apprenticeship (work preparation)
d410	Changing basic body position	d845	Acquiring, keeping and terminating a job
d415	Maintaining a body position	d850	Remunerative employment
d430	Lifting and carrying objects	d855	Non-remunerative employment
d440	Fine hand use	d870	Economic self-sufficiency
Environmental Factors (33)			
e11001	Drugs	e340	Personal care providers and personal assistants
e115	Products and technology for personal use in daily living	e355	Health professionals
e120	Products and technology for personal indoor and outdoor mobility and transportation	e360	Other professionals
e125	Products and technology for communication	e430	Individual attitudes of people in positions of authority

(continued)

Table 2.2 (continued)

ICF Code	ICF Category Title	ICF Code	ICF Category Title
e130	Products and technology for education	e450	Individual attitudes of health professionals
e135	Products and technology for employment	e460	Societal attitudes
e150	Design, construction and building products and technology of buildings for public use	e465	Social norms, practices and ideologies
e155	Design, construction and building products and technology of buildings for private use	e525	Housing services, systems and policies
e225	Climate	e535	Communication services, systems and policies
e240	Light	e540	Transportation services, systems and policies
e250	Sound	e550	Legal services, systems and policies
e260	Air quality	e555	Associations and organizational services, systems and policies
e310	Immediate family	e565	Economic services, systems and policies
e320	Friends	e570	Social security services, systems and policies
e325	Acquaintances, peers, colleagues, neighbors and community members	e580	Health services, systems and policies
e330	People in positions of authority	e585	Education and training services, systems and policies
		e590	Labor and employment services, systems and policies
Body Functions (17)			
b117	Intellectual functions	b164	Higher-level cognitive functions
b126	Temperament and personality functions	b210	Seeing functions
b130	Energy and drive functions	b230	Hearing functions
b134	Sleep functions	b235	Vestibular functions
b140	Attention functions	b280	Sensation of pain
b144	Memory functions	b455	Exercise tolerance functions
b152	Emotional functions	b730	Muscle power functions
b160	Thought functions	b740	Muscle endurance functions
		b810	Protective functions of the skin

Table 2.3 Brief Core Set for Vocational Rehabilitation. (*Source* Escorpizo et al., 2010; adapted from www.icf-research-branch.org)

ICF Code	ICF Category Title
Activities and Participation (6)	
d155	Acquiring skills
d240	Handling stress and other psychological demands
d720	Complex interpersonal interactions
d845	Acquiring, keeping and terminating a job
d850	Remunerative employment
d855	Non-remunerative employment
Environmental Factors (4)	
e310	Immediate family
e330	People in positions of authority
e580	Health services, systems and policies
e590	Labor and employment services, systems and policies
Body Functions (3)	
b130	Energy and drive functions
b164	Higher-level cognitive functions
b455	Exercise tolerance functions

2.4 WORQ

A prime example of how the ICF has been put to use in the field of vocational rehabilitation is the Work Rehabilitation Questionnaire (WORQ) (Finger et al., 2013). Citing discrepancies in the implementation of the ICF due to lack of a standardized measurement tool, Finger et al. developed an instrument that would address the complex nature and multi-aspects of vocational rehabilitation by utilizing the bio-psycho-social model of the ICF.

WORQ was developed based on the ICF Core Set for vocational rehabilitation (Finger et al., 2013). Questions were either drawn from other, previously validated questionnaires such as the WHO Disability Assessment Schedule 2.0 (WHODAS 2.0) and World Health Survey (WHS), or derived based on technical definitions of ICF categories from the ICF handbook (Finger et al., 2013; WHO, 2001). WORQ contains all 13 categories from the Brief Core Set for Vocational Rehabilitation, as well as 31 additional categories from the Comprehensive Core Set for Vocational Rehabilitation (Finger et al., 2013).

WORQ consists of two sections and is designed to be self-reported. The first section consists of 17 items, including sociodemographics, work-related questions, and environmental support and service. The second section consists of 36 items that specifically address work-related functioning. For each of these items, the respondent is asked to rate

their difficulty over the past week on a scale of 0–10, with 0 being "no problem" and 10 being "complete problem".

The initial English questionnaire was first translated into German for psychometric testing at a vocational rehabilitation centre in Switzerland (Finger et al., 2013). In addition to English and German, WORQ is now available in French, Russian, Mandarin Chinese (Taiwan), Turkish, Icelandic, Danish, Japanese, Portuguese-Brazil, and Flemish (www.myworq.org). Self-reported and interviewer-administered versions of the survey are free and can be downloaded at www.myworq.org. A study is currently underway to validate a short form of WORQ for use in the United States. This short form would have a second section with 13 items instead of the current 36.

Implementing WORQ in the vocational rehabilitation setting will help provide a clear picture of the worker's functional performance and capacity, aiding in a common understanding between health professionals involved in interdisciplinary care. It will provide uniformity in reporting in the clinic, at the work site, and in research. Furthermore, this uniformity in reporting will extend across systems and countries that utilize WORQ, which may contribute to the cross-national understanding of vocational rehabilitation outcomes.

2.5 Clinical Practice Appraisal for Work Rehabilitation

The Occupational Health Special Interest Group (OHSIG) of the American Physical Therapy Association is set to release a Clinical Practice Guideline (CPG) on vocational (work) rehabilitation assessment and intervention. This CPG is comprised of guidance statements that will provide stakeholders with valuable information regarding best evidence and best practice in vocational rehabilitation. Guidance statements were developed that encompass a variety of work-related and bio-psycho-social factors. Many of the developed guidance statements follow the bio-psycho-social model set forth by the ICF, and showcase that numerous factors must be taken into account when helping individuals return to work. Along with the bio-psycho-social perspective considered by the CPG is the emphasis on multidisciplinary approach to facilitate early and sustained return to work.

2.6 Moving Forward: The Next Steps

Implementing WORQ and findings from the CPG into clinical care will be the important next steps to enhance communication between employers, payers, and healthcare professionals so return to work can be facilitated for individuals with work disability. The ICF-based CPG will provide clinicians with best-evidence vocational rehabilitation assessment and intervention that examines the multifactorial nature of return to work by way of a holistic and comprehensive perspective.

The 11th revision of the ICD (ICD-11) was released on 18 June 2018 (WHO, 2016). ICD-11 will integrate the ICF in the form of "functioning properties" in order to capture the impact of disease or health on functioning (Escorpizo et al., 2013). The linking of the ICD and ICF will provide a standard language that will aid communication between clinicians, payers, employers, and other stakeholders. This could also provide a common language for a standardized electronic health record system that is consistent with ICF (Escorpizo et al., 2013).

Moving forward, it will be of utmost importance to develop tools for clinicians and researchers alike. Utilizing the ICF framework to create an implementation toolkit or process-oriented algorithm for decision-making for occupational health in general is necessary. This toolkit will provide clinicians with a list of best practices in terms of vocational rehabilitation, encompassing intervention techniques and appropriate outcome measures utilized in an attempt to standardize work rehabilitation practices. The implementation of such a toolkit will address the heterogeneity in vocational rehabilitation process, thereby improving quality of care and the worker experience.

2.7 Conclusion

The ability to achieve and maintain meaningful employment is of the utmost importance for working-age adults due to the severe social, economic, and psychological consequences of work disability. Work disability is complex in nature, and a comprehensive framework like the ICF is ideal to highlight the factors affecting return to work with consideration to the workplace and environment in which the worker operates and the relevant individual personal factors. Integrating the ICF into vocational rehabilitation assessment and intervention will thereby improve worker outcomes by providing a standardized language for healthcare professionals, employers, employees, and payers.

References

Baker, P., Goodman, G., Ekelman, B., & Bonder, B. (2005). The effectiveness of a comprehensive work hardening program as measured by lifting capacity, pain scales, and depression scores. *Work: Journal of Prevention, Assessment & Rehabilitation, 24*(1), 21–31.

Boden, L. I., Reville, R. T., & Biddle, J. (2005). The adequacy of workers' compensation cash benefits. In J. Burton, K. Roberts, & M. Bodah (Eds.), *Workplace injuries and diseases: Prevention and compensation* (pp. 37–68)., Essays in Honor of Terry Thomason Kalamazoo: W.E. Upjohn.

Centers for Disease Control and Prevention. (2009). Workplace Safety and Health Topics. Traumatic occupational injuries. www.cdc.gov/niosh/injury/.

Cieza, A., Ewert, T., Üstün, T. B., Chatterji, S., Kostanjsek, N., & Stucki, G. (2004). Development of ICF Core Sets for patients with chronic conditions. *Journal of Rehabilitation Medicine, 36*(44 Suppl), 9–11.

Escorpizo, R., Ekholm, J., Gmünder, H.-P., Cieza, A., Kostanjsek, N., & Stucki, G. (2010). Developing a Core Set to describe functioning in vocational rehabilitation using the international classification of functioning, disability, and health (ICF). *Journal of Occupational Rehabilitation, 20*(4), 502–511.

Escorpizo, R., Reneman, M. F., Ekholm, J., Fritz, J., Krupa, T., Marnetoft, S. U., et al. (2011). A conceptual definition of vocational rehabilitation based on the ICF: Building a shared global model. *Journal of Occupational Rehabilitation, 21*(2), 126–133.

Escorpizo, R., Kostanjsek, N., Kennedy, C., Nicol, M. M., Stucki, G., Üstün, T. B., et al. (2013). Harmonizing WHO's International Classification of Diseases (ICD) and International Classification of Functioning, Disability and Health (ICF): Importance and methods to link disease and functioning. *BMC Public Health, 13,* 742.

Escorpizo, R., Brage, S., Homa, D., & Stucki, G. (2015). *Handbook of vocational rehabilitation and disability evaluation: Application and implementation of the ICF.* Springer.

Fayed, N., Cieza, A., & Bickenbach, J. (2011). Linking health and health-related information to the ICF: a systematic review of the literature from 2001 to 2008. *Disability and Rehabilitation, 33*(21–22), 1941–1951.

Finger, M. E., Escorpizo, R., Bostan, C., & Bie, R. D. (2013). Work rehabilitation questionnaire (WORQ): development and preliminary psychometric evidence of an ICF-based questionnaire for vocational rehabilitation. *Journal of Occupational Rehabilitation, 24*(3), 498–510.

Li-Tsang, C. W. P., Li, E. J. Q., Lam, C. S., Hui, K. Y. L., & Chan, C. C. H. (2008). The effect of a job placement and support program for workers with musculoskeletal injuries: a randomized control trial (RCT) study. *Journal of Occupational Rehabilitation, 18*(3), 299–306.

Occupational Safety and Health Administration. (2015). Adding inequality to injury: the costs of failing to protect workers on the job. https://www.dol.gov/osha/report/20150304-inequality.pdf.

Seabury, S. A., Scherer, E., O'Leary, P., Ozonoff, A., & Boden, L. (2014). Using linked federal and state data to study the adequacy of workers' compensation benefits. *American Journal of Industrial Medicine, 57,* 1165–1173.

Stucki, G., Ewert, T., & Cieza, A. (2002). Value and application of the ICF in rehabilitation medicine. *Disability and Rehabilitation, 24*(17), 932–938.

World Health Organization. (2001). *International classification of functioning, disability and health*. Geneva: World Health Organization.

World Health Organization. (2002). Towards a common language for functioning, disability and health: ICF. http://www.who.int/classifications/icf/icfbeginnersguide.pdf.

World Health Organization. (2016). The International Classification of Diseases 11th Revision is due by 2018. http://www.who.int/classifications/icd/revision/en/.

3 Work Ability Assessment: A Description and Evaluation of a New Tool in Vocational Rehabilitation and Disability Claims

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Abstract

Iceland is experiencing a growth in disability benefits similar to other European countries. As a consequence, assessment procedures and partial disability benefits have come under scrutiny. The work ability assessment procedure was initiated based on a report from the Prime Ministry in 2007 investigating whether the new work ability assessment is a useful tool in vocational rehabilitation and disability claims. The work ability assessment is a comprehensive assessment of the individual's ability to participate actively in the labor market from a physical, mental and social perspective. In the developmental phase, established work ability assessment methods from other countries were tested as well as consensus meetings and developmental projects with clinical experts nationally and internationally. Based on the current developmental project the work ability assessment is deemed a useful instrument in vocational rehabilitation and disability claims. It serves the purpose both as an instrument and as a method and is in accordance with the most modern definitions and understanding of work ability. The work ability assessment procedure is a systematic evaluation which emphasizes the individual's resources and opportunities and increases adaption with early intervention and vocational rehabilitation. The method is an continuous assessment process of information gathering in a structured way in which the overall aim is to increase the individual's work ability. Based on the assessment, vocational rehabilitation or other types of work-related interventions are chosen, or, if work is not an option, a decision on eligibility of disability benefit is considered.

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3.1 Introduction

The increasing number of people on disability benefit is a matter of concern in the OECD countries. This increase has also been apparent in Iceland during the last decade. This increase has put a lot of financial strain on the state and on the pension funds (Herbertsson, 2005). It is not only the cost concerning the disability that is of concern. Part of the problem is that too many workers leave the labor market permanently due to health problems and at the same time many people with health-related work-capacity deficits are denied the opportunity to work (OECD, 2008). The welfare states in European countries are under pressure, which is why work-related assessment methods and partial disability benefits have come under scrutiny (OECD, 2007). To ensure that individuals with partial work capacity remain in or enter the labor market, it has been shown that reforming assessment methods is an important element. Activating measures and increased focus on what the individual can do has been shown to be effective in getting people back to work (OECD, 2010).

The Prime Ministry in Iceland (2007) put together a working group of clinical specialists to review the assessment methods of eligibility for disability benefits. In their report they state the need for different assessment methods focusing on individuals' resources and not barriers for entering the labor market. When the current work ability assessment was developed, other European countries had gone through similar structural reforms of their assessment procedures, focusing more on empirical knowledge and experience. Empirical research and reports in the field of rehabilitation and vocational rehabilitation were consulted to evaluate the effectiveness of work-related assessments.

In 2010, OECD published a report in which the experiences of the member states were evaluated (OECD, 2010). It stated that most of the OECD countries use medically driven models to determine disability benefit entitlement, however these are often unreliable. This led to a significant number of people with partial work capacity being deemed unable to work. Recent trends, however, indicate that focusing on the resources of individuals with partial work capacity may prove a more fruitful avenue to pursue. A number of countries are successfully using mainstream employment policy, including activation measures to support individuals with partial work capacity to take up work. At the same time some countries have managed to bring down inflow to disability benefit by using early work-related interventions (OECD, 2010).

3.2 International Classification of Functioning, Disability and Health (ICF)

The International Classification of Functioning, Disability and Health (ICF) is used as a theoretical framework for the work ability assessment. The ICF, developed by the World Health Organization (WHO) is a framework for measuring health and disability at individual levels and it encompasses all aspects of human health and functioning. At the

same time, it excludes circumstances that are not health-related such as socio-economic factors, race, gender and religion. The domains in ICF are classified from body, individual and societal perspectives by means of two broad components: body functions and structure, and activity and participation (WHO, 2010). Health and functioning are the key words in ICF as it looks at the function of the individual in the environment and context in which he/she lives, regardless of what caused the impairment (Gunnarsdóttir, 2003). It deals with functioning as a positive category and disability as a negative category. Since an individual's functioning and disability occurs in a context, the ICF also includes the component environmental factors (WHO, 2010).

This classification and coding system enables clinicians to standardize information and assessment of health-related function and functional impairment. At the same time it describes functions from different perspectives (Gunnarsdóttir, 2003). As a result of this structure, ICF provides a multi-perspective approach to the classification of functioning and disability as an interactive and evolutionary process. If a holistic approach is to be preferred, all components in the ICF framework should be taken into account (Nordenfelt, 2008).

3.3 ICF Core Set

To facilitate a systematic and comprehensive description of functioning and the use of the ICF in clinical practice and research, ICF Core Sets have been developed (WHO, 2010). A formal decision-making process is applied in the making of the Core Set. First there is a national meeting that comes up with suggestions of ICF categories that should be included in the Core Set. Thereafter, a formal voting procedure is applied to reach consensus for a final Core Set (Brage et al., 2008).

The background of an ICF Core Set is to provide a list of selected categories from the entire classification that can serve as minimum standards for an assessment, including documentation of functioning and health in clinical studies, clinical consultations and multi-professional comprehensive assessment. Therefore, ICF Core Sets are consensus based lists of ICF categories relevant for specific health conditions (Cieza et al., 2004). For practice and research, an ICF Core Set contains categories which should be measured while it has to be kept in mind, however, that it provides no information about how to measure them (Swiss Paraplegic Research, 2006).

3.4 Development of ICF Core Set for Disability Evaluation in Social Security

European Union of Medicine in Assurance and Social Security (EUMASS) represents social insurance doctors in Europe. Its aim is to help maintaining and improving standards in social insurance medicine (EUMASS, 2010). Within EUMASS there is an

ICF-working group that developed and successfully reached consensus on a Core Set for functional assessments in disability benefit claims. This Core Set is generic, and is intended to be used by medical doctors in the evaluation of rights for long term benefits (Brage et al., 2008). This Core Set is part of the Icelandic work ability assessment.

3.5 Influence From Other Countries

The Scandinavian countries have reformed their disability system in recent years. Iceland has been lagging behind—a situation which could be explained by the fact that a rise in disability pensions occured later compared to the other Nordic countries. The experience and assessment methods in Norway, Sweden and Denmark had a major influence on the development of the work ability assessment in Iceland (Solli, 2007). In particular, a change in the assessment methods from focusing on barriers individuals have in terms of staying at work or returing to work to assessing individuals' coping abilities and personal factors that promote work abilty.

3.6 Main Features of the Work Ability Assessment

The work ability assessment is defined as a comprehensive assessment of the individual's ability to participate actively in the labor market from a physical, mental and societal perspective. It describes resources and opportunities as well as it detects barriers with regard to participation in the labor market. The work ability assessment is a continuous process of assessment and evaluation on the one hand and activation measures in vocational rehabilitation and treatment on the other hand.

The aim of the assessment process is to increase the individual's work ability by selecting appropriate work-related interventions tailored to the individuals' needs. This means that not only are physical and mental health factors assessed but also the home environment and work context of the individual, thereby adhering to the ICF framework. As a consequence, less than optimal health in one area does not mean that an individual is not capable of working. Capacity and strength in other areas may outweigh weaknesses and enable the individual to work taking into account appropriate adaptations. At the same time, this assessment is intended to enhance available opportunities so that it enables and motivates the individual to be a proactive participant in the labor market. The interaction of many different factors is therefore relevant in this context.

The Icelandic work ability assessment can be divided into three phases:

1. Basic assessment
2. Special assessment
3. Re-assessment

Basic assessment is defined as a systematic gathering of information and advice, supervision and encouragement by the vocational rehabilitation consultant. It takes place when the individual can no longer work due to health problems. The individual can be referred to a consultant by the employer, general practitioner or unions. The purpose is to promote health, improve social conditions and motivate early return to work. In the basic assessment, detailed information about the overall situation of the individual is gathered and the emphasis is placed on early intervention, activation and to remove barriers for work. The vocational rehabilitation consultant empowers, motivates and activates the individual based on contextual factors related to work and social environments. The basic assessment is necessary to elucidate the degree to which special assessment is needed.

Special assessment is defined as a detailed analysis and evaluation of options and possibilities of vocational rehabilitation and is conducted by one or several external clinical experts, such as general practitioners, physical therapists, occupational therapists, psychologists, and social workers. In the special assessment the individual's options are explored and evaluated further compared to the basic assessment, with a particular emphasis on all work-related options. The result of the special assessment should indicate the individual‘s potential in vocational rehabilitation and answer the question how work ability could be enhanced. A comprehensive vocational rehabilitation plan should be appended. Special assessment should be conducted if the individual has complicated health and work circumstances and requires detailed assessment according to the ICF framework leading to a comprehensive rehabilitation plan, or if more than six months have passed since the basic assessment without obtaining part or full time work or if the return to work plan is not meeting the expectations.

Re-assessment is defined as a re-evaluation that occurs when the vocational rehabilitation plan of the special assessment is completed or has not been followed or completed. The result of the re-assessment may indicate that vocational rehabilitation should be repeated because optimal work ability has not been achieved. A vocational rehabilitation consultant carries out the re-assessment and should always consider whether further external expert opinion is required.

Further details about the development of the work ability assessment and the research investigation (Konráðsdóttir, 2011) can be downloaded from the research repository in Iceland.

3.7 Discussion

Iceland is experiencing a growth in disability benefits similar to other European countries. Effective trends in lowering disability rate have shown that reforming work ability assessment methods is an important element where the focus should be on individuals' resources to support return to work and promote early intervention (OECD, 2010). It has also been suggested that disability needs to be assessed on an individual level

(Nordenfelt, 2008) as the degree of impairment that is related to diseases or injuries cannot determine the overall disability of the individual (Solli, 2007). The work ability assessment procedure was initiated based on a report from the Prime Ministry in 2007 (Prime Ministry, 2007) investigating whether the new work ability assessment is a useful tool in vocational rehabilitation and disability claims.

The work ability assessment is a comprehensive assessment of the individual's ability to participate actively in the labor market from a physical, mental and social perspective. It is a continuous process of assessment and evaluation on the one hand and activation measures such as vocational rehabilitation and clinical and physical treatment on the other hand. The aim of the assessment process is to increase the individual's work ability by exploring and intervening in work-related rehabilitation according to the ICF model. Early intervention is based on the basic assessment carried out by a vocational rehabilitation consultant where a systematic gathering of information and advice, supervision and encouragement is emphasized. In complex cases, special assessment is conducted and here the EUMASS ICF Core Set is used by clinical experts. The Core Set is used early in the process to highlight the environmental factors acting as facilitators in the return to work and vocational rehabilitation process as well as factors in activities and participation. Factors related to health and function are therefore highlighted early in the rehabilitation process, thus connecting disability assessment and vocational rehabilitation.

The work ability assessment, its method, instruments and development have been developed based on established methods from Denmark, Sweden and Norway. The strength of the assessment is its consensus among national and international experts about which areas of the ICF model vocational rehabilitation should target. The implementation of the validated ICF Core Set by EUMASS is seen as a strength of this study. Clinical instruments, such as depression, anxiety and functional scales have been used in order to carry out a comprehensive assessment. Qualitative surveys that included medical doctors and sick listed individuals have revealed that the method has face and content validity. Further validation studies should be conducted prior to rolling out the work ability assessment in clinical practice in Iceland.

3.8 Conclusion

The work ability assessment serves the purpose of both, an instrument and a method, and is in accordance with the most modern definitions and understanding of work ability. The assessment is systematic and comprehensive, focusing on resources and motivations inherent in the individual, minimizing functional loss through early intervention of vocational rehabilitation. The method itself is a continuous process of information gathering in a structured way in which the aim of the whole comprehensive assessment process is to increase the individual's work ability. The work ability assessment enables clinicians to make reliable recommendations whether vocational rehabilitation or disability benefit, part or full, should be offered to individuals who have fallen out of the labor market.

References

Brage, S., Donceel, P., & Falez, F. (2008). Development of ICF core set for disability evaluation in social security. *Disability and Rehabilitation, 30,* 1392–1396.

Cieza, A., Ewert, T., Üstün, T. B., Chatterji, S., Kostanjsek, N., & Stucki, G. (2004). Development of ICF Core Sets for patients with chronic conditions. *Journal of Rehabilitation Medicine, 36*(44 Suppl), 9–11.

EUMASS. (2010). EUMASS - UEMASS European Union of Medicine in Assurance and Social Security.http://eumass.com/images/.eumass/organisation/info%20and%20history.pdf.

Gunnarsdóttir, V. (2003). *ICF flokkunarkerfirð og notagildi þess á Íslandi.* Author.

Herbertsson, T.Þ. (2005). *Fjölgun öryrkja á Íslandi. Orsakir og afleiðingar.* Reykjavík: Ministry of Health and Social Security.

Konráðsdóttir, A.D. (2011). *Work ability assessment - description and evaluation of a new tool in vocational rehabilitation and in disability claims*. Master thesis in health services management at the University of Bifröst, Iceland. http://hdl.handle.net/1946/7912.

Nordenfelt, L. (2008). *The concept of work ability.* P.I.E. Peter Lang.

OECD. (2007). New ways of addressing partial work capacity. OECD thematic review on sickness, disability and work. Issues paper and progress report. http://www.oecd.org/dataoecd/6/6/38509814.pdf.

OECD. (2008). Modernising sickness and disability policy. OECD thematic review on sickness, disability and work issues paper and progress report. http://www.oecd.org/dataoecd/5/62/40495992.pdf.

OECD (2010). *Sickness, disability and work: Breaking the barriers. A synthesis of findings across OECD countries.* Author.

Solli, H.M. (2007). *Rettferdighet og objektivitet i trygdemedisinske uförhetsvurderinger: En etisk og vitenskapsfilosofisk analyse av tre uförhetsmodeller i et historisk perspektiv.* Insititutt for allmenn- og samfunnsmedisin.

Swiss Paraplegic Research. (2006). Introduction into the International Classification of Functioning, Disability and Health (ICF). http://www.icfcasestudies.org/index.php?id=103.

The Prime Ministry. (2007). Skýrsla nefndar um endurskoðun örorkumats og eflingu starfsendurhæfingar. http://www.ll.is/files/bbhdcgdfgf/Lokaskyrsla_orokubotanefndar_forsatisradherra.pdf.

World Health Organization. (2010). International Classification of Functioning, Disability and Health (ICF). http://www.who.int/classifications/icf/en/.

Work Ability Management in Rehabilitation and Return to Work: A Perspective from Austria

4

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Abstract

The concept of work ability encompasses issues of individual workers' abilities in light of their present job tasks taking into account the demands and resources that might be important in the future. Due to a rise in life expectancy in the EU, there has been an increase in the proportion of elderly workers. Aging workers put forth new challenges as aging is usually accompanied by chronic health issues and early exits from the labor market, which puts pressure on the social security systems. One of the ways to support social security systems is through reintegration of workers into the labor force (concept of "return to work"). Austria has been one of the EU member states recognised as having an inclusive return to work system with a strong emphasis on prevention. However, issues remain in lack of cross-policy communication and legislative framework. The following chapter provides an insight into the most common ways work ability is conceptualized, followed by a short analysis of the Austrian social insurance system with emphasis on issues of rehabilitation and return to work.

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4.1 Introduction

Giving a clear definition of work ability is not easy. The basic conceptualization of work ability lies upon the following questions: "How able is the worker to perform the work tasks at present and how able will he/she be in the future, especially in the light of his/hers personal resources on one the hand and job demands on the other?" (Ilmarinen, 1993). This type of conceptualization is praised for putting the individual in focus, however it does not explicitly show the multidimensionality of factors that influence work ability (Gould, 2008; Sturesson et al., 2013). Demands put upon the workers up to the mid-20th century were fairly alike and demands were primarily physical with most work related illnesses being a result of physical exertion. With the technological advancement there have been changes in demands that have shifted to the more cognitive and emotional with the connections between morbidity and work not being as clear. In this sense, the concept of work ability has changed from purely medical and developed into a more holistic way, aimed at the individual and the balance between personal resources and work demands (Ilmarinen, 2009). Since work ability does not fall into one exclusive branch of science, the definition and concepts of work ability therefore seem to depend on the professional point of view: an occupational health view (issues of balance between personal resources and work demands), public health (protecting and improving existing personal resources of workers) or rehabilitation (developing new resources or rehabilitating the existing ones).

Several models of work ability have been proposed, however, one of the generally more accepted ones in Austria (and overall) that emphasizes the multimodality of factors that influence work ability is the "House of Work Ability" model (Gould, 2008). This model depicts work ability as a four floor house with its surroundings. The main floors include:

1. (Basic level): Health and functional ability (a certain level of physical and mental health is a prerequisite of work ability) (Ilmarinen et al., 2015);
2. Competencies (education, knowledge and skills to perform certain tasks are important parts of the ability to work) (Gould, 2008; Ilmarinen et al., 2015);
3. Personal opinions and motivation (personal views and motivation to work are crucial parts of work ability and are put in the middle of the model) (Sturesson et al., 2013);
4. (Top level): Organisation (job task design, organisation of work and management are important as they influence all the other, "lower" floors) (Gould, 2008; Ilmarinen et al., 2015; Tengland, 2011).

When observing the model it is possible to see that the first three floors "Health and Functional Ability", "Competencies" and "Personal Opinions and Motivation" constitute personal resources of the workers themselves, while the fourth floor "Organisation" is the so called "work dimension" that covers the work environment and community as well as actual context and organisation of work.

Outside the main house, the model depicts the fifth factor, the so called "life context". This includes family and social relationships as well as the cultural context, social security and leisure activities. These factors have been shown to have an effect on the ability to work, as work ability is strongly influenced by environmental factors (Gould, 2008; Ilmarinen, 2009, 2011; Nordenfelt, 2003; Tengland, 2007, 2011).

4.1.1 Determining Work Ability

Difficulties in finding an appropriate definition of a complex issue like work ability are similar when it comes to finding a uniform way of determining work ability. Basing work ability determination on expert opinions and objective measures is problematic. An individual approach with subjective estimations has been shown to be a good predictor of work ability and work disability (Tuomi et al., 1997). Therefore, when determining work ability, an individual approach is necessary as work ability is often connected to personal attitudes and perceptions of workers towards the organization. In a study of 26 small businesses in Austria, 241 workers were surveyed and the results indicated that individual perceptions of the organization's health and stress management were connected to subjective work ability (Grabovac et al., 2017). The end decision on work ability needs to be based on the current findings but also be influenced by the point of view or the reason for determining work ability: rehabilitation and social security benefits of specific occupations (Gould, 2008). Ideally, work ability needs to be assessed by an inter- and multidisciplinary team consisting of a variety of medical and health specialists but also health allied professionals and rehabilitators (occupational and physical therapists, psychologists, speech pathologists) (Ilmarinen et al., 2015). The results of a work ability assessment need to be taken into account only for the present moment, as with rehabilitation, treatment and workplace ergonomic interventions, the work ability may be improved over time. From a public health perspective, determining work ability means a chance to gather data in order to monitor the health of the workforce, evaluate the possible positive effects of health promotion strategies as well as underlining the importance of work ability in the population.

4.1.2 Measuring Work Ability

Measuring work ability may not be controversial when it is evaluated towards a specific work task, however most jobs today require flexibility, versatility, and a wide area of activities making the evaluation of work ability a challenge. Even though most evaluations themselves are more or less constant, the fact that work ability measurements are always aimed at a specific reason makes the task more complex. For example, social security institutions might only be interested in the functional capacity and physical health, while the management of a company might want a more practical evaluation

taking organisational aspects into account. Work ability might be measured for entire work communities where assessments of organisational culture are more important than the individual worker.

When speaking about individual workers and evaluation of individual work ability, physical, psychological, and social measurements and evaluations need to be implemented, and subjective and objective methods applied. The extent of each measurement/evaluation needs to be predetermined in the light of the vocational group and the reason for determining work ability (Kim et al., 2015; Sluiter, 2006; Tengland, 2011).

Measuring work ability can include different physiological tests (cardiac exercise stress testing, 24 h blood pressure and ECG monitoring, tilt-test, tests of pulmonary function), psychological batteries (different psychometric tests as well as neuropsychological measurements of reaction time, memory, decision-making), and subjective evaluations (for instance using the Work Ability Index) (Grabovac et al., 2016; Kim et al., 2015; Sluiter, 2006).

4.2 Rehabilitation

Rehabilitation is the process of recovering optimal physical, sensory, intellectual, psychological and social functional levels and is therefore instrumental in enabling people with disabilities to remain in or return to their home or community, live independently, and participate in education, the labor market and civic life (World Health Organization, 2017). As such, there is a clear distinction between rehabilitation and acute care, whereby acute care aims to eliminate illness, which in turn may prolong the need for additional health care as a result of an illness. Rehabilitation consists of many facets and uses a wide variety of therapeutic modalities usually consisting of three different aspects: medical rehabilitation (aims to restore functional abilities and capacity), occupational rehabilitation (focuses on enabling people to maintain a degree of functional independence or return to employment and/or meaningful occupation) and social rehabilitation (aims to help with reintegration into social life). As such, rehabilitation is a part of universal health coverage and needs to be implemented with other essential health services such as prevention, health promotion, treatment and palliation (Krug & Cieza, 2017; World Health Organization, 2017). All aspects of rehabilitation are equally important and together provide a holistic process for the individual. However, in the following, we focus more on occupational rehabilitation.

Importance of Rehabilitation for the Health Care Systems

Life expectancy in the EU has increased by 3.2 years (aged between 77.7 and 80.9 years) from 2002 to 2014 (Eurostat, 2016). The aging population, together with the raising of the retirement age, brings changes in the demographic picture of the working population leading to a rise in “older” workers. In 2015, the proportion of gainfully employed people aged between 55 and 64 was 20% with an expectancy to reach 21% by 2020

(Fotakis & Peschner, 2015). With the rise in the proportion of aging workers, issues of occupational health and safety as well as productivity in older workers come to light, as aging is associated with higher risks of various chronic illnesses. It has been reported that 36% of workers aged between 55 and 64 years suffer from various chronic health issues, which is more than double of the 16% that workers aged between 16 and 44 report (Eurostat, 2017). Chronic illnesses may be aggravated by exposure to workplace hazards and may present an additional risk in terms of work injuries or development of occupational illnesses. These may lead to more sickness absence, disability pension, early retirement, or unemployment. And staying away from work, on the other hand, is a risk factor for developing a number of health issues, including physical and mental diseases, and social exclusion (Aranki & Macchiarelli, 2013). Thus, early retirement and disability pension present an additional financial burden on the social and health insurance systems.

Rehabilitation in Austria

In Austria, two basic rehabilitation services are available; inpatient rehabilitation (provides accommodation and rehabilitation in specialised rehabilitation centres) and ambulatory rehabilitation (no accommodation, based in rehabilitation centres or acute hospitals outpatients clinics, or free standing and independently practicing physicians and therapists). In 2016, there were 79 rehabilitation centres in Austria with an overall capacity of 10.783 beds, this is more than double the capacity in 1999, which was around 5.000 beds (Bundesministerium Für Gesundheit und Frauen, 2016). Ambulatory rehabilitation is still limited but has been scaled up recently. Rehabilitation expenditures are on the rise and are around one third of total expenditures for all insurance institutions which amounted to 335 million euros in 2011 which is also a 45% increase in comparison to 2005 (Hofmarcher & Quentin, 2013).

Rehabilitation as a whole is available for patients and based on the following:

1. Need for rehabilitation (existence of a long lasting reduction in capacity, which limits normal activities);
2. Suitability for rehabilitation (patients require a level of physical and psychological ability to participate in rehabilitation);
3. Rehabilitation prognosis (set of goals to be achieved in a certain time frame) (Hofmarcher & Quentin, 2013).

Rehabilitation measures are in principle paid for by the social insurance institution if the application for rehabilitation has been completed by the patient in advance. Additional explanations by the general practitioner or medical specialist that underline the need for rehabilitation and goalsetting are also required. Mandatory social insurance in Austria consist of three different branches: health insurance, retirement insurance, and accident insurance. People in Austria cannot choose their social insurance, they are assigned to an insurance depending on their profession and residency. All three different types of insurance institutions are involved in rehabilitation, but focus on different aspects of rehabilitation:

- Health insurance agencies: there are a total of 5 health insurance funds in Austria providing comprehensive health care coverage to 99.9% of the population. In terms of rehabilitation, these institutions aim to provide a comprehensive medical rehabilitation with aspects of social and vocational rehabilitation (i.e. rehabilitation that focuses on returning lost skills, or developing new ones, that are connected to a specific job) in order to achieve reintegration. The services covered by the public health insurance agencies are mainly offered to retired people, children or spouses.
- Retirement insurance agencies are a part of the compulsory benefits package and offer rehabilitation programs that aim to prevent early retirement due to impairment or illness. As such, they aim to provide occupational and social rehabilitation in order to reintegrate people to the labor market. Therefore, this type of rehabilitation is offered to currently gainfully employed people.
- Accident Insurance Institution pays for rehabilitation services in case of proven workplace related injury or occupational illness, or injuries that occurred on the way to or from work. The largest (AUVA) provides cover to over 4 million workers, pupils and students as well as self-employed people and provides rehabilitation and treatment in 11 different institutions (4 rehabilitation centres and 7 acute hospitals) it operates. The goal is reintegration into the workplace by providing various types of occupational rehabilitation (such as ergonomic adaptation of the workplace, workplace consultations, on-site advocacy, increasing work independence and function, energy saving techniques, cognitive rehabilitation, reducing postural strain) (Allgemeine Unfallversicherungsanstalt, 2016).

Despite the existing rehabilitation facilities, there is lack of occupational rehabilitation programs in Austria and these are still largely in development by various insurance companies with support from academic institutions that are involved in empirically evaluating and developing programs.

4.3 Return to Work

Given the rapid rise in health care costs, there is a need for a concept to sustain the social insurance systems and to reduce the economic burden of sickness absence and unemployment. This might be found in the "return to work" concept that surrounds all measures and incentives to ensure and speed up the process of reintegration to the workplace of people who had a reduction in their work ability. In a recent report published by the European Agency for Safety and Health at Work (EU-OSHA) 32 European countries have been analysed and grouped by their approaches and obligations to return to work and rehabilitation systems (Belin et al., 2016). The report has found similarities between Austria, Denmark, Finland, Germany, the Netherlands, Norway, and Sweden stating that these countries have an "all inclusive" system (as all workers are entitled to rehabilitation), as well as for their focus on prevention, early intervention and

broad responsibilities of the employers. Other groups (Belgium, France, Iceland, Italy, Luxembourg, Switzerland and the UK) show a well-developed framework for rehabilitation but the somewhat dis-jointed systems make it difficult for people to navigate through; the third group are countries (Bulgaria, Estonia, Hungary, Ireland, Lithuania, Portugal, Romania, Spain) that do not have coordinated approaches and limited institutional support, while Croatia, Cyprus, the Czech Republic, Greece, Latvia, Malta, Poland, Slovakia and Slovenia have very limited frameworks and narrow inclusiveness of return to work programs mainly aimed at people with all types of disabilities described in national guidelines (Belin et al., 2016).

The system analysis does indicate that Austria has laid good groundwork, which is a necessary prerequisite for an inclusive return to work concept. However, there is still a number of issues that need to be taken into consideration. The myriad of stakeholders (5 public social insurance funds followed but many more "specialist" insurance institutions) make certain aspects of rehabilitation and return to work coverage problematic. This is usually the result of a lack of cross-policy coordination and communication. On a lower level there is a problem with enabled professionals. Austria exports a large number of medical students as there are issues of post-graduation retention. This impacts the medical specialities involved with rehabilitation and return to work issues (occupational medicine, public health, physical medicine) and is largely due to the lack of employment and training possibilities. For instance, there are only about 344 specialists for physical medicine, 111 for occupational medicine (out of which only 50 work full time) and seven public health specialists in Austria (Statistik Austria, 2015). Lack of specialists but also places to provide specialist training (only one for public health and 13 for occupational medicine) in Austria create an even larger deficit in specialist staff. Additionally, a large proportion of the rehabilitation services are offered through general practitioners who receive little financial incentives for these services. Moreover, there is a lack of programmes that deal with the issues of work ability and promoting return to work among health care professionals. This further influences the level of communication between medical and allied medical professionals (social workers, occupational and physiotherapists, psychotherapists) that would be included in the reintegration process. This unnecessarily prolongs the return to work process that is usually a complex, medium to long process that requires a number of steps to be followed that require combined actions of different professionals.

Based on the system analysis, EU-OSHA identified several factors that are common to the most successful return to work practices.

These include:

- a coherent legal framework (a legal framework covering all aspects of the return to work process);
- an integrated policy framework (an all-encompassing framework base that provides a foundation for coordination);
- effective coordination mechanisms (coordination that is needed across public health, employment, occupational health and safety and social security issues);

- a scope of the system (an inclusive system open to all workers is necessary);
- early intervention (earlier interventions increase the chance of quicker reintegration);
- tailored intervention (interventions need to be tailored to the needs of the individual worker and require active participation by the worker);
- case management (a case management approach eases communication and coordination and facilitates the process);
- incentives (either increasing the employers' responsibilities or providing help to the employers, and for workers aligning benefits with rehabilitation process and encouraging part time work during the process);
- support activities (technical or financial but also aimed towards different intermediary organisations to allow for better information flow) (Belin et al. 2016).

Austrian Strengths and the "Fit-2-Work" Project

Given the apparent limitations, Austria has several strengths that provide a good basis for further development; a large network of rehabilitation centres throughout the country, as well as an established network of medical universities and other higher education institutions that cooperate well and present hubs for project evaluation and innovation.

In terms of legislative support, there have been recent strives to provide a framework for enabling rehabilitation for workers who have, for different reasons, been out of the labor market for extended time periods. This framework was conceptualised within the "Statute on Work and Health" (Arbeits- und Gesundheits-Gesetz) under the name "Fit-2-Work" (Fit-2-Work, 2018; Nationalrat der Republik Österreich, 2017). The project has a central objective of maintaining and sustainably improving the employability of workers but also provide preventive measures of premature withdrawal from the labor market. The project is envisioned as a tertiary prevention measure with centres opened in all Austrian states that provide counselling on an individual case base and then direct the users to other facilities when necessary (occupational health specialist, rehabilitation centres, psychologists). The project is financed partly by different ministries and organisations involved with labor, health and social issues (unemployment service, pension insurance, accident insurance, health insurance institutions and the Ministry of Labor and Social Affairs).

4.4 Conclusion

The complexity of work ability, rehabilitation and return to work presents researchers and those working in practical implementation with a great challenge. In times of raising entrepreneurship and many workers employed by small and micro companies, issues of return to work may be especially challenging, as such companies usually do not employ human resources or occupational health and safety experts. These types of companies require external support, which should be offered by intermediary stakeholders such as insurance institutions.

For those involved in developing return to work strategies based on empirical evidence, raising awareness on the importance of return to work and rehabilitation is paramount. Public health measures in the field of occupational health are of great importance in order to facilitate the necessary changes. In order to effectively reintegrate a worker to a workplace, certain elements of the company´s organisational culture need to be changed. This is a very important but rarely recognised need. Additionally, we call for more research in the field, especially regarding psychosocial influences on work ability, effectiveness of return to work programs and their impact on organizational culture.

References

Allgemeine Unfallversicherungsanstalt (AUVA). (2016). *Jahresbericht 2015*. Vienna.

Aranki, T., & Macchiarelli, C. (2013). *Employment Duration and Shifts into Retirement in the EU*. Working Paper Series. European Central Bank.

Belin, A., Dupont, C., Oules, L., Kuipers, Y., & Dries-Tersch, E. (2016). *Rehabilitation and return to work: Analysis report on EU policies, strategies and programmes*. European Agency for Safety and Health at Work.

Bundesministerium für Gesundheit und Frauen. (2016). Betten in Krankenanstalten. http://www.kaz.bmgf.gv.at/ressourcen-inanspruchnahme/betten.html.

Eurostat. (2016). Mortality and life expectancy statistics. http://ec.europa.eu/eurostat/statistics-explained/index.php/Mortality_and_life_expectancy_statistics.

Eurostat. (2017). People having a long-standing illness or health problem, by sex, age and labour status. http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do.

FIT-2-WORK. (2018). Was ist Fit-2-Work? http://fit2work.at/artikel/was-ist-fit2work.

Fotakis, C., & Peschner, J. (2015). *Demographic change, human resources constraints and economic growth. The EU challenge compared to other global players*. Publications Office of the European Union.

Gould, R., Ilmarinen J., Järvisalo J., & Koskinen S. (2008). *Dimensions of Work Ability - Results of the Health 2000 Survey*. Finnish Institute of Occupational Health.

Grabovac, I., Jordakieva, G., Stefanac, S., & Godnic-Cvar, J. (2016). Utvrdivanje i povratak radne sposobnosti nakon transplantacije srca. Workability Management. Following Cardiac Transplantation. *Medicus, 25,* 243–248.

Grabovac, I., Luger, E., Haider, S., Migschitz, M., Schnitter, C., & Dorner, T.E. (2017). Zusammenhang zwischen Arbeitsumgebung und subjektiver Arbeitsfähigkeit in Kleinunternehmen im Burgenland. In: Dorner, T. E. & Lackinger, C. (eds.) *20. Wissenschaftliche Tagung der Österreichischen Gesellschaft für Public Health.* Eisenstadt, Österreich: Österreichische Gesellschaft für Public Health.

Hofmarcher, M., & Quentin, W. (2013). *Austria: Health System Review*.

Ilmarinen, J. (2009). Work ability - a comprehensive concept for occupational health research and prevention. *Scandinavian Journal of Work, Environment & Health, 35,* 1–5.

Ilmarinen, J. (2011). *Arbeitsfähig in die Zukunft*. VSA Verlag.

Ilmarinen, J., & Toumi, K. (1993). *Aging and Work*. Finnish Institute of Occupational Health.

Ilmarinen, V., Ilmarinen, J., Huuhtanen, P., Louhevaara, V., & Nasman, O. (2015). Examining the factorial structure, measurement invariance and convergent and discriminant validity of a novel self-report measure of work ability: work ability–personal radar. *Ergonomics, 58,* 1445–1460.

Kim, Y., Jung, K., Ryu, J. Y., Kim, D. H., & Lee, S. (2015). A case of fitness to work in a worker with COPD using the exercise stress test. *Annals of Occupational and Environmental Medicine, 27,* 26.

Krug, E., & Cieza, A. (2017). Strengthening health systems to provide rehabilitation services. *European Journal of Physical and Rehabilitation Medicine, 53*(23), 153–154.

Nationalrat der Republik Österreich. (2017). *Arbeits- und Gesundheit- Gesetz BGBl. I Nr. 111/2010*. Rechtsinformationssystem des Bundes.

Nordenfelt, L. (2003). Action theory, disability and ICF. *Disability and Rehabilitation, 25,* 1075–1079.

Sluiter, J. K. (2006). High-demand jobs: Age-related diversity in work ability? *Applied Ergonomics, 37,* 429–440.

Statistik Austria. (2015). Personal in Gesundheitswesen. http://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/gesundheit/gesundheitsversorgung/personal_im_gesundheitswesen/index.html.

Sturesson, M., Edlund, C., Fjellman-Wiklund, A., Falkdal, A. H., & Bernspang, B. (2013). Work ability as obscure, complex and unique: views of Swedish occupational therapists and physicians. *Work: Journal of Prevention. Assessment & Rehabilitation, 45,* 117–128.

Tengland, P. A. (2007). A two-dimensional theory of health. *Theoretical Medicine and Bioethics, 28,* 257–284.

Tengland, P. A. (2011). The concept of work ability. *Journal of Occupational Rehabilitation, 21,* 275–285.

Tuomi, K., Ilmarinen, J., Klockars, M., Nygard, C. H., Seitsamo, J., Huuhtanen, P., et al. (1997). Finnish research project on aging workers in 1981–1992. *Scandinavian Journal of Work, Environment & Health, 23*(Suppl 1), 7–11.

World Health Organization. (2017). Disability and rehabilitation. http://www.who.int/disabilities/en.

Adaptation of an ICF-Based Questionnaire for Vocational Rehabilitation in Germany

5

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Abstract

Due to demographic changes, the welfare state principle and the solidarity principle are under scrutiny. Social security funds must now consider European labor mobility and immigration. The healthcare market is a growth market. Inpatient rehabilitation, however, does not grow proportionally to the market due to the existing legal framework. The introduction of the Social Code (SGB) Ninth Book (IX) and the definition of disability based on the bio-psycho-social model of the International Classification of Functioning, Disability, and Health (ICF) and the expert assessment of the need for rehabilitation lead to the ICF increasingly being implemented. An effective tool in this setting is the standardized Work Rehabilitation Questionnaire (WORQ), based on the ICF, which is freely available in six languages. Motivation plays a pioneering role in rehabilitation, especially for Return to Work (RTW). The aim of this study was to cross-culturally adapt the WORQ to German and to investigate whether the WORQ in combination with the Diagnostic Tool for Work Motivation (DIAMO) can be used to target suitable rehabilitation measures and improve RTW. First, a cross cultural adaptation of the WORQ is needed in a German rehabilitation setting. This adaptation

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requires interdisciplinary collaboration between the developers of the WORQ, independent advisors, patients, and other scientists. This study report on the quantitative results and recommendation for clinical practice is discussed in this chapter.

5.1 Introduction

Health is not everything – but without health everything is nothing.
-- Arthur Schopenhauer (1788–1860), German philosopher

The improvement in prevention, the rehabilitation process in clinics and outpatient facilities, is necessary to enable work and integration. The current public discussions about the cost explosion in health care, the demographic change, the increase in the statutory retirement age after 2030 (Bofinger et al., 2016, p. 38), demography collective agreements (Zumbeck, 2017, p. 16), and workplace design in line with the concept of *'Arbeit 4.0'* (Braun, 2016, pp. 13–16) give rise to further considerations about the targeted and more efficient use of the available funds with regard to treatment success (Belzl, 2006). The desire of the *Techniker Krankenkasse* (TK) to collect and evaluate personal member data by means of fitness bracelets (Becker, 2016, p. 4), shows how up-to-date and important the topic of effective health prevention and rehabilitation by social insurance institutions is. As part of a feasibility study, we evaluated the benefits of the International Classification of Functioning, Disability, and Health (ICF; World Health Organization, 2011) and the holistic bio-psycho-social model for assessing needs and participation in working life for a cross-agency use of each institution for implementation (*Bundesministerium für Arbeit und Soziales,* 2016, S. 27, 28; Schubert et al. 2014, p. 133). The ICF is a language with an internationally recognized vocabulary standard for uniform communication in interdisciplinary communication (Vreeman and Richoz, 2015). This allows for an assessment of individual needs and the required service provision in the context of dynamic process control (Schubert et al., 2014, p. 133).

In 2018, 411 billion euros were spent on health services in Germany (*Statistisches Bundesamt,* 2020), which is 4.944 euros per inhabitant. This is an increase of 96 billion euros or 23% compared to 2013 (*Statistisches Bundesamt,* 2016b; 2020). Figure 5.1 shows the development of health expenditure from 2005 to 2018 in euros.

It should be noted that within health expenditure, according to the *Statistisches Bundesamt*, only expenditure on the final consumption of health goods, services and investments in the health sector is included (excluding intermediate consumption such as the production of medicines and sales to pharmacies). In addition, research and development costs are included, provided they are carried by the issuers. Expenses for care, occupational health insurance and health measures for reintegration into working life are also considered health expenditure (*Statistisches Bundesamt* [Destatis], 2017a). Not included are costs for wellness, fitness, or accommodation in nursing homes.

This chapter deals with the framework conditions set out in the *Sozialgesetzbuch* (SGB), Ninth Book (IX)—Rehabilitation and Participation of Disabled Persons, 2001.

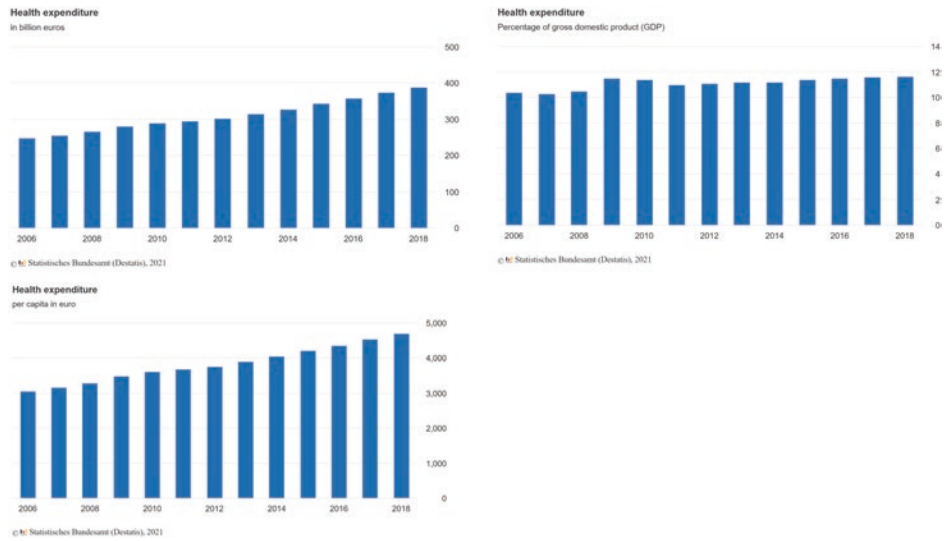

Fig. 5.1 Health Expenditure 2005–2018. (*Source* Statistisches Bundesamt, 2016a; 2020)

Rehabilitation is an interdisciplinary research field of psychology, social psychology, medicine, sociology, ethics, data protection, and law. In 2015, around 7.6 million persons were severely disabled, that is, 9.3% of the total population in Germany, 51% of which were men. Persons who have been granted a degree of disability of 50 % or more by the healthcare authorities and given a valid ID card, are considered to be severely disabled (*Statistisches Bundesamt*, 2016d). The numbers increase with the increasing life expectancy in Germany. More than one billion people in the world live with some form of disability, of whom nearly 200 million experience considerable difficulties in functioning (World Health Organization, 2011, p. xi). Spending on rehabilitation amounted to € 32.6 billion in 2014 (*Reha-Info,* 2016, S. 1). Figure 5.2 shows the percentages of expenditures by each carrier.

The participation services are subdivided into four service groups within the meaning of § 5 SGB IX. These are the services for medical rehabilitation, support and supplementary benefits, benefits for participation in the community life as well as benefits for participation in working life, for example, retraining. The costs of the partial hire services will be allocated to them according to the tasks of the individual carriers. The house of rehabilitation providers within the meaning of § 6 SGB IX illustrates this in Fig. 5.3.

In Germany, the number of inpatient rehabilitation patients decreased by 0.2% in 2015 compared to the previous year. In 2015, 19.2 million rehabilitation patients were hospitalized in hospitals. The 1.153 prevention or rehabilitation facilities differ in ownership or legal form according to public (229), non-profit (300), and private (624) institutions. The 624 private preventive or rehabilitation facilities are dominant in the market (*Statistisches Bundesamt,* 2016c). The participation of the rehabilitation facilities is

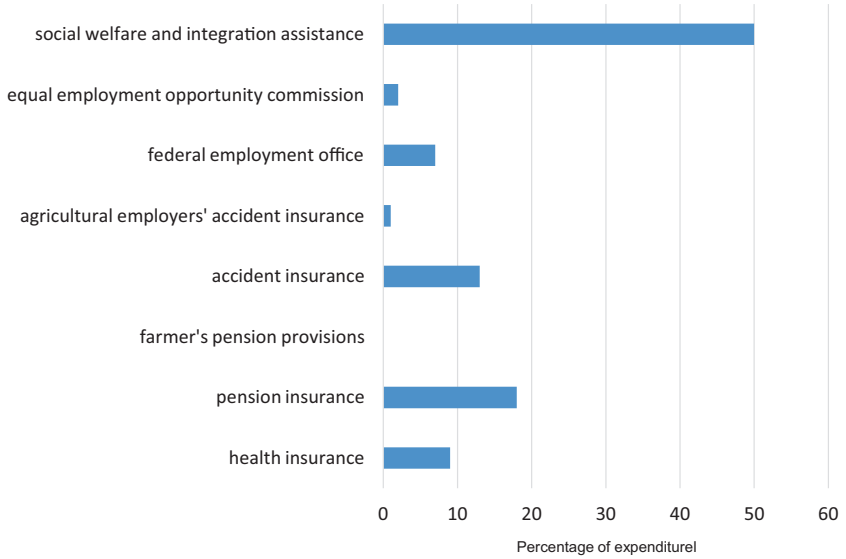

Fig. 5.2 Expenditure Ratio (in Percentage) of € 32.6 Billion in Rehabilitation Spending in Rehabilitation Institutions in 2014

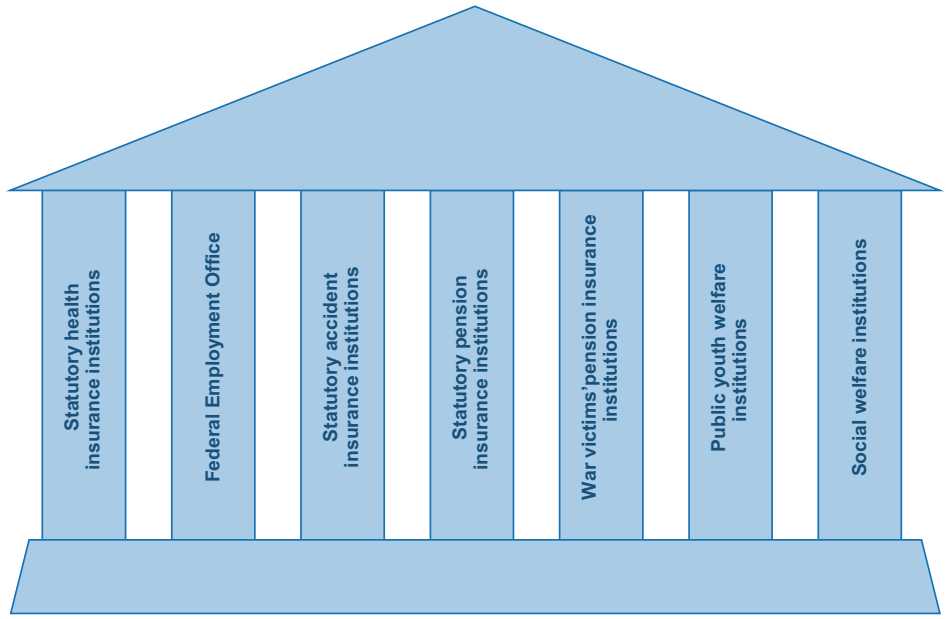

Fig. 5.3 House of Rehabilitation Institutions according to § 6 SGB IX

approved by the German Pension Insurance for inpatient medical rehabilitation either after having gone through inpatient hospital treatment (e.g. after surgery or chemotherapy) (AHB) (*Deutsche Rentenversicherung Bund,* 2006), or following the requirements of the statutory accident insurance at the 'Professional Association's stationary treatment (BGSW)' for injuries of the musculoskeletal system according to § 34 SGB VII (*Deutsche Gesetzliche Unfallversicherung und Sozialversicherung für Landwirtschaft, Forst und Gartenbau,* 2016).

The distribution by facilities, staff and age group in the prevention or rehabilitation facilities is shown in Fig. 5.4. Inpatient treatments include, in the context of accident insurance, the professional association's stationary treatment (BGSW), e.g. after severe injuries of the musculoskeletal system, and the complex inpatient rehabilitation (KSR), e.g. after a cross-sectional injury (Simmel et al., 2014, pp. 524–529). Pensions for reduced work capacity due to mental disorders more than doubled during the period from 1993 to 2010 (Fig. 5.5). In Germany, the legal framework is designed and implemented by the *Sozialgesetzbuch* (SGB) or by regulations and guidelines. The importance of the topic stems from the current discussion on demographic change, skills shortages, legislation, prevention, or cost restraints on public budgets.

The rehabilitation, prevention, and participation are interdisciplinary scientific research fields, which overlap with psychology, law, social sciences, medicine, sports science, and business administration. As a result, a definition of the term in this article is

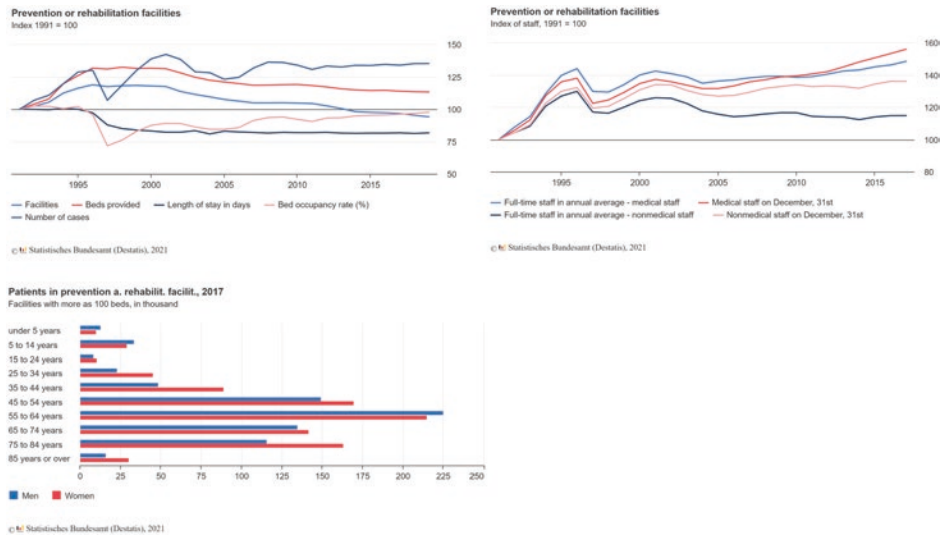

Fig. 5.4 Prevention and Rehabilitation Facilities by Facilitites, Staff and Patients by Age Group 2014. (*Source* Statistisches Bundesamt, 2015, table time series updated in 2021, p. 7)

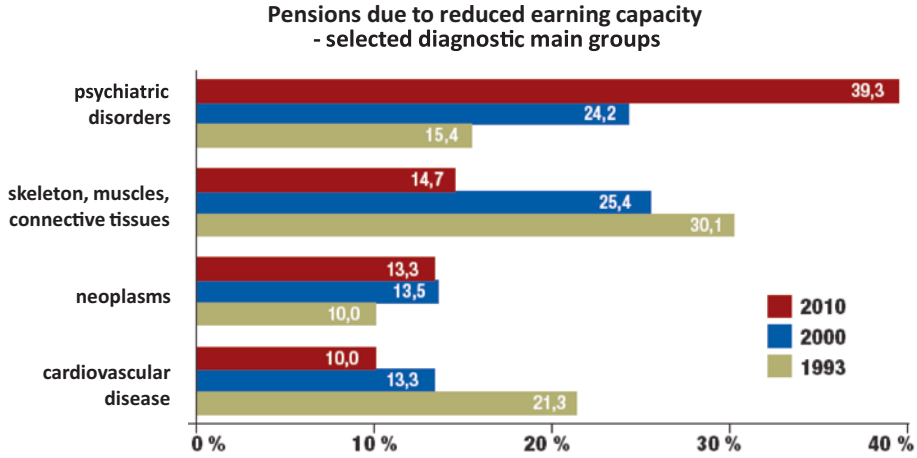

Fig. 5.5 Pensions due to Reduced Earning Capacity. (*Source* Adapted from Bering and Schmidt-Ohlemann, 2013, p. 3)

essential in order to create a common level of understanding. In 1948, the WHO defined health as follows:

> *"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."* (World Health Organization, 2011; Klein, 2015, p. 34).

In the delimitation of the health term, the disability term is defined according to the decision of the European Court of Justice Kaltoft ECJ (12/18/2014, case C-354/13):

An illness of an employee is considered a disability when it constitutes

> *"a limitation which results in particular from physical, mental or psychological impairments which in interaction with various barriers may hinder the full and effective participation of the person concerned in professional life on an equal basis with other workers, and the limitation is a long-term one"* (Albert et al. 2016, p. 397).

In the individual European member states, the goals and definitions for the term disability and thus the disability policy are different (Maschke, 2008, p. 5775). In Germany, the Ninth Book of the Social Code—Rehabilitation and Participation of Disabled Persons—(Neuntes Buch SGB IX) defines disability in § 2 (1):

> *Menschen sind behindert, wenn ihre körperliche Funktion, geistige Fähigkeit oder seelische Gesundheit mit hoher Wahrscheinlichkeit länger als sechs Monate von dem für das Lebensalter typischen Zustand abweichen und daher ihre Teilhabe am Leben in der Gesellschaft beeinträchtigt ist. Sie sind von Behinderung bedroht, wenn die Beeinträchtigung zu erwarten ist. (Neuntes Buch SGB IX, Bundesgesetzblatt i. d. F. of 06/19/2001 BGBl. l, p. 1046, 1047; last changed at 07/26/2016 BGBl. l, pp. 1824, 1837, § 2 (1))*

> *People are disabled if their physical function, mental ability, or mental health is likely to be more than six months away from the typical state of life, and therefore their participation in society is impaired. You are at risk of disability if the impairment is expected. (Own Translation)*

In rehabilitation and prevention practice, these and other framework conditions should be directly integrated into practice-oriented and applicable organizational procedures.

The International Classification of Diseases (ICD) has been in existence for more than 100 years, and its amendment, the International Classification of Functioning, Disability, and Health has existed for more than 16 years (Stucki, 2012, p. 1). In order to understand the ICF concept of functioning, it is necessary to compare the definitions made in the previous section. Disability is seen in relation to functioning. The domain ranges from complete functioning to complete disability on a gradual scale as illustrated in Fig. 5.6 (Bickenbach, 2012 p. 5). The 'functioning' includes the body functions, body structures, and activities and participation. The integrative bio-psycho-social model of functioning, as illustrated in Fig. 5.7, shows the mutual influences of the individual factors and components (Rauch et al., 2012, p. 9). The terms used in the model are described in more detail in Table 5.1.

Fig. 5.6 Illustration of Functioning, e.g. Hearing According to the ICF

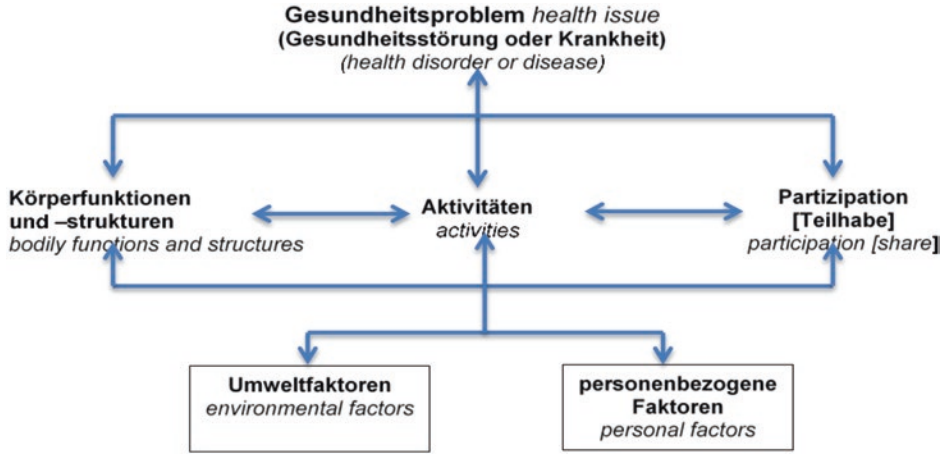

Fig. 5.7 The Integrative Bio-psycho-social Model of Functioning, Disability, and Health

Table 5.1 Definition of the Bio-psycho-social Model of Functioning, Disability, and Health (*Source* Rauch et al., 2012, p. 10)

Positive	Negative
Body functions: physiological and psychological functions	Damage in terms of a reduction in body function or structure
Body structures: anatomical body parts, e.g., the eye, the foot, the heart, and the individual components	
Activity: to be able to perform an action or task e.g. climbing stairs	Impairment: problems with the execution of the activity e.g. climbing stairs with aids.
Participation: participation in life situations, e.g. exercising a profession	Impairment of participation; Impairments of participation in life situations, e.g. toilets for the disabled are not available in every restaurant
Facilitators	Barriers
Environmental factors (social, material and attitude-related) can be conducive or disabling	
Definition of the components of functioning, disability, and health personal factors can be conducive or disabling	

To develop a common understanding of the ICF, a hierarchical coding system has been suggested. The ICF has a hierarchical structure and consists of two parts: "functioning and disability" and "contextual factors".

These two factors again consist of two components each:

- "Functioning and disability"
  - Body functions and structures
  - Activities and participation
- "Contextual factors"
  - Environmental factors
  - Person-related factors (not yet defined)

The categories are subdivided according to the chapter heading (item of the first level) down into the item of the fourth level (Table 5.2) (Rauch et al., 2012, p. 11).

The ICF model and category system aim to make it clear that the interactions between the individual factors and components can lead to imbalances, for example, after an accident, a cancer diagnosis, or a job loss. This can lead to a prolonged absence from work. As a result, professional contacts can be reduced, and the work rhythm that gives structure to everyday life can change or break down considerably, and eventually material losses can occur. Health is thus not only an attribute of a person but affects the entire social and environmental context of the person. The following Fig. 5.8 illustrates a version of the bio-psycho-socio-ecological concept of health following the WHO's definition of health (see above) .

Table 5.2 The Hierarchical Structure of the ICF (*Source* WHO, 2001, cf. Rauch et al., 2012, p. 11)

ICF				
Parts	Functioning and disability		Contextual factors	
Component	Body functions and structures	Activities and participation	Environmental factors	Person-related factors
Chapter First Level	b1–b8	s1–s8	e1–e5	internal influences, impact
Categories Second Level	b110–b899	s110–s899	e110–e999	
Categories Third Level	b1100–b7809	s1100–s8309	e1100–e5959	
Categories Fourth Level	b11420–b54509	s11000–s76009		

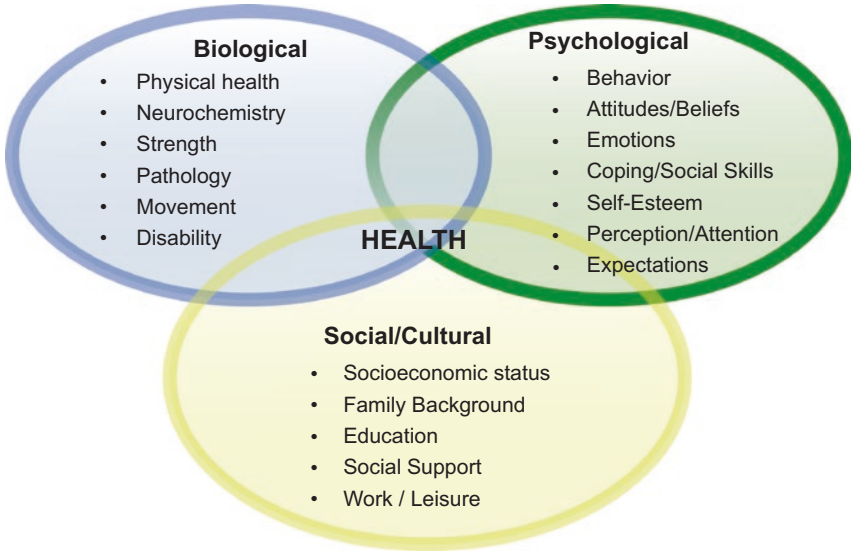

Fig. 5.8 The Bio-psycho-socio-ecological Concept of Health

The basis for this model is to ease 'return to work' (RTW), such as re-entry into working life after a long period of unemployment or sickness absence. This multi-scientific knowledge of psychology, neurobiology, medicine and integrative therapy forms the basis for health coaching (Hartz & Petzold, 2014, p. 61). In doing so, the volitional competencies required to face this challenge are promoted, for example, by restrictions of physical functioning. Education and professional status seem to play a central role in the

perception of the job situation. Obviously, perceived job risks may increase the health risk of workers.

In order to find a suitable individual 'return to work' approach, the German-speaking Work Rehabilitation Questionnaire—WORQ (Finger et al., 2013) was developed for the first time in Germany. The aim of the questionnaire is to standardize information about the person, the professional situation, rehabilitation, and function. With this information, a multifunctional team (e.g. doctors, physiotherapists, osteopaths, psychologists, and nutritionists) should use this questionnaire individually as a communication and documentation basis for rehabilitation and RTW to enable development processes. The advantage of the multimodal concepts in rehabilitation is being guided by the statutory accident insurance controlling the treatment of the injured and referring to a professional accident clinic to protect individuals from disability (Bethge, 2011, p. 145). As part of the rehabilitation documentation, the 'Integration of ICF documentation tools into the rehabilitation cycle' was developed, which with the WORQ can form a documentation basis by means of the ICF (Glassel et al., 2012, p. 467). As part of the rehabilitation, the data on the questionnaires WORQ and Diagnostic Tool for Work Motivation (DIAMO) (Fiedler et al., 2008) have not yet been collected in Germany. The WORQ has been translated in Switzerland to Swiss-German, therefore only for the German-speaking region (Swiss Paraplegic Research/ICF Research Branch).

The adaptation of the WORQ was preceded by a literature search on rehabilitation test procedures used in Germany. The identification of tests measuring rehabilitation motivation and treatment expectation or work motivation is listed in Table 5.3.

The development of the WORQ was based on the ICF core set for vocational rehabilitation consisting of 90 categories, of which 13 are included in the Brief ICF Core Set (Finger et al., 2013). The WORQ has been cross-culturally adapted to several languages, and for German speaking persons, it has been adapted to German-Switzerland and German-Germany (see www.myworq.org; Finger et al., 2013, 2015; Finger and Escorpizo 2016a, b; Veith-Tezeren et al., 2017b, c). The German-Germany adaptation was carried out as part of a research project to improve rehabilitation and RTW, guided by a quality management approach, i.e. SWOT analysis and the Continuous Improvement Cycle (see Figs. 5.9 and 5.10).

The WORQ enables self-assessed patient reports and clinician rated assessments. The results can be used to tailor the rehabilitation process also in relation to other relevant therapies. Combinations with other questionnaires within psychology, pain therapy, physiotherapy, and sociology are also possible. The strength lies in the ICF language and in the WORQ since it has been cross-culturally adapted to the legal and cultural framework in different languages. In Germany, with approximately 646.000 employed persons from different countries (*Statistisches Bundesamt,* 2017b), language barriers are common in the rehabilitation facilities.

Table 5.3 Questionnaires for Rehabilitation Motivation and Work Motivation

Name	Questionnaire	Rehabilitation, Cronbach's Alpha	Items and scales or dimensions
FBTM	Questionnaire for occupational therapy motivation	of the four scales is considered "satisfactorily high" (Zwerenz, 2008, S. 85).	24 items, 4 scales
FEZ	Questionnaire on expectations and goals of rehabilitation	"[…] between .70 and .83 at a satisfactory level" (Faller & Vogel, 2008, S. 89).	75 items, 19 scales
FMP	Questionnaire to measure psychotherapy motivation	"… satisfactory to very good rehabilitation parameters […] of .91 for the total scale, for the subscales between .71 (II) and .86 (III)" (Schneider et al., 2008, S. 91, 92).	47 items, 4 scales
FPTM	Questionnaire for psychotherapy motivation	"… satisfactory to very good values […] .68 (scale WI) and .92 (scale LD)" (Nübling & Scholz, 2008, p. 95)	39 items, 6 scales
FREM-17	Questionnaire to measure rehabilitation-related expectations and motivation	"Except for the 'Health scale', the scales are… satisfactory to good internal consistencies…" Cronbach's Alpha between .50 and .90 (Deck et al., 2008, , p. 99)	17 items, 4 dimensions
RAREMO	Questionnaire for recording rehabilitation motivation	"[…] was between .62 and .93 for the individual samples…" (Nübling et al., 2008, S. 103)	20 items, 6 scales
DIAMO	Diagnostic instrument for work motivation	"[…] good consistency values for the concepts MS and MH (Cronbach's Alpha .77 to .86… content-rationally derived concept MP is the value Cronbach's Alpha… from .59 to .81" (Fiedler et al., 2008, S. 366)	57 items, 10 scales

5.2 Method

The two clinics participating in this study were the Berufsgenossenschaftliche Unfallklinik (BGU), Frankfurt am Main, which is part of the hospital group of statutory accident insurance gGmbH and a private non-profit company, while the HKB-Klinik GmbH & Co., Klinik Rabenstein (KR) is a private clinic (Veith-Tezeren, 2017a). The cross-cultural adaptation of the WORQ German-Germany (GG; self-report long version and brief versions) was carried out with the participation of the authors of the original test following standard procedures of a cultural adaptation regarding questionnaires

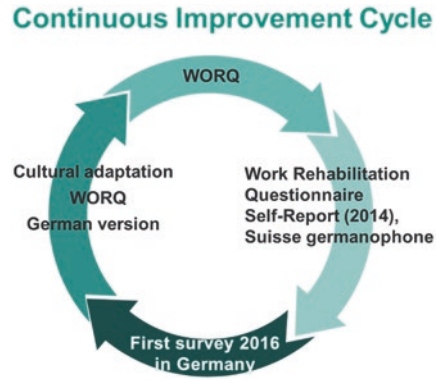

Fig. 5.9 Continuous Improvement Cycle

Word Rehabilitation Questionnaire (WORQ)

- **Strengths**
  - Unified ICF-Code
  - Modular country-specific
    - Social security-, pension system
  - Early indicators of psychic problems
- **Chances**
  - Shared global model
  - Optimisation or rehabilitation and participation
  - Guiding therapies and RTW
- **Weaknesses**
  - Item-scoring response overview
  - Response calculation matrix
- **Risks**
  - Multiple versions (brief, self, interviewer, country-biased)
  - Operationalisation

Fig. 5.10 Strengths and Weaknesses (SWOT Analysis) of WORQ

(e.g. experts, lay participants and patients). The questionnaires used in this study were thus the DIAMO (Fiedler et al., 2008) and WORQ GG. The standardized work motivation questionnaire DIAMO has closed questions and utilizes a so-called item wording effect, a methodological artefact used in empirical social research (Fiedler et al., 2008, p. 481).

Sample

The aim of this study was to cross-culturally adapt the WORQ to German and to investigate the relationship between the WORQ and the DIAMO as well as their association with different rehabilitation measures. The BGU clinic only accepts rehabilitation patients from accident insurance companies or privately insured persons, while the CR is open to all insured persons if the diagnosis is approved for treatment. Power calculations for t-tests with an α-error probability of 0.05 and a power of 0.8 and able to detect an average effect of $d = 0.5$ resulted in a sample size of $N = 128$, or $N = 64$ in each clinic. The power calculations for the correlations was based on an α-error probability of 0.05

and a power of 0.8 capable of revealing a mean effect of | r | = 0.3 resulting in a sample size of N = 82.

Adaptation WORQ–German-Germany

The first pre-test of the WORQ GG in Germany at the KR revealed that the educational system and vocational training, as well as the social welfare system of Switzerland, differ from those in Germany. Language barriers also led to problems of understanding that could only be resolved in a one-to-one interview, which meant that the study had to be based on interviews. Cross-cultural adaptations of the WORQ German Swiss self-report and brief versions to WORQ GG started by recruiting three patients and three neutral persons after the first pre-test survey in the KR by expert groups. The exchange of information on the WORQ GG took place through personal meetings and discussions, through voting on the results via e-mails and via telephone conferences. Particular attention was paid to the differences in school and vocational qualifications between the USA, Switzerland, and Germany. The patient group, two women and one man, concluded at the ratio of two to one, that the WORQ German-Swiss was too long. In addition, the question sequence was criticised. The group of neutral persons, two women and two men, concluded at the ratio of three to one, that the WORQ GG was not too long. The expert group of six people, three women and three men, focused on the cross-cultural adaptation of Part 1 in the WORQ GG. Particularly on understanding the content of the questions and on the length, as the existing WORQ GG should be limited to not more than six pages. The order of the questions in the brief and SR versions of the WORQ GG was changed so that they were compatible with the order within the ICF coding system. In Part 2 of the WORQ GG questionnaire, only linguistic adjustments were made.

Statistical Analysis

Data were analysed using LimeSurvey, G*Power and R Version 3.3.3. Missing values resulting from unanswered questions were supplemented by a mean value imputation. An independent samples t-test was used to analyse group differences. The t-test assumes a normal distribution of the examined variables in both groups. This can be assumed for a sample size greater than N = 30 in both groups (Gravetter & Wallnau, 2009, p. 204). Pearson correlation coefficient was used to analyse the association between two variables. Associations between the work motivation of the rehabilitation patients using DIAMO and ICF impairments using WORQ were explored.

5.3 Results

A total of 163 participants aged between 18 and 65 years took part in the study (mean age 47.9 years), consisting of 117 men and 45 women (one participant did not indicate gender). Table 5.4 shows the martial status of the participants.

Table 5.4 Marital Status in % WORQ HD

Marital Status	%
Married	52
Single	26
Divorced	11
In cohabitation	4
Living separately	4
Widowed	3

WORQ-HD is a short name for WORQ SR GG

Education

40% of the participants had a lower secondary school diploma (*Hauptschule*) forming the largest group, while 33% had a higher secondary school degree (*Realschule*), and 13% had *Abitur* or general university entrance qualification (*Hochschulreife*). The number of other school qualifications were less than 10%. Figure 5.11 shows the distribution of education among the participants.

Vocational Qualifications

The vocational qualifications are illustrated in Fig. 5.12. Most notably is that 63 participants have completed a certificate of apprenticeship, while 28 participants have obtained an academic degree.

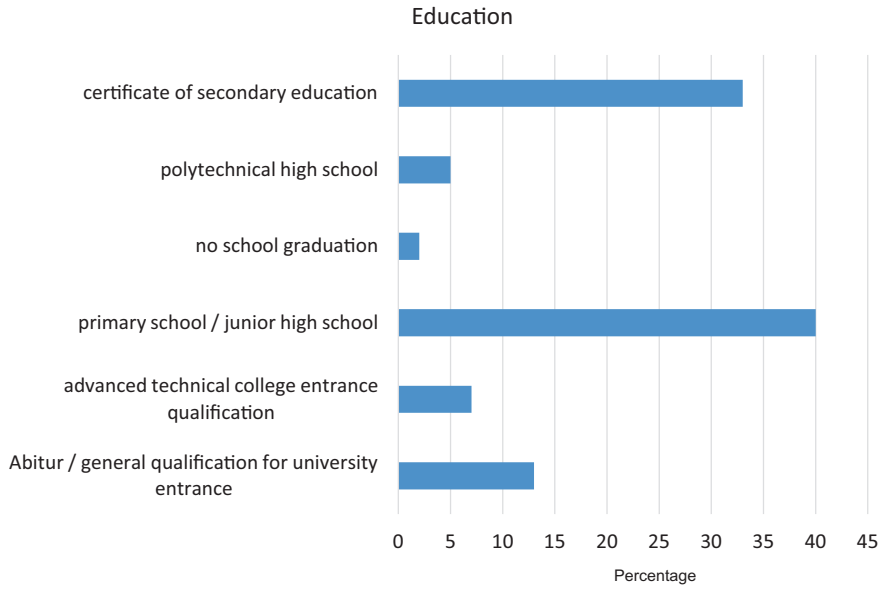

Fig. 5.11 Distribution of Education

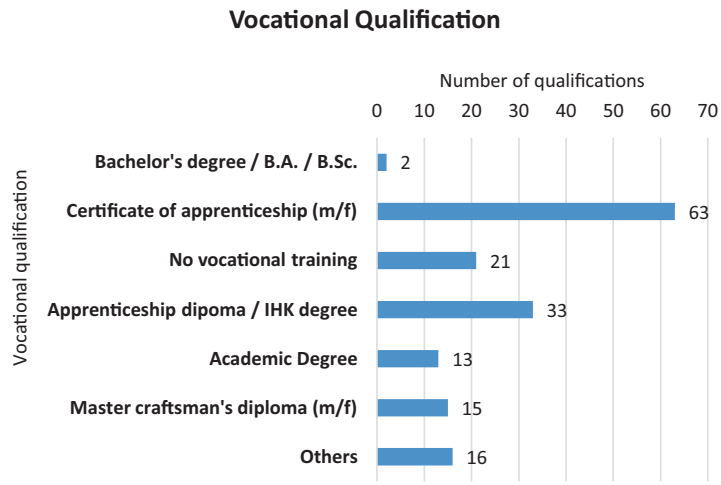

Fig. 5.12 Vocational Qualifications of Respondents

Occupational Relationships in the Main Activity

Most of the participants were employed (87%) as displayed in Fig. 5.13. The BGU exclusively provide treatment for persons undergoing rehabilitation in connection with their occupation, by accident, occupational disease, or an impending occupational disease.

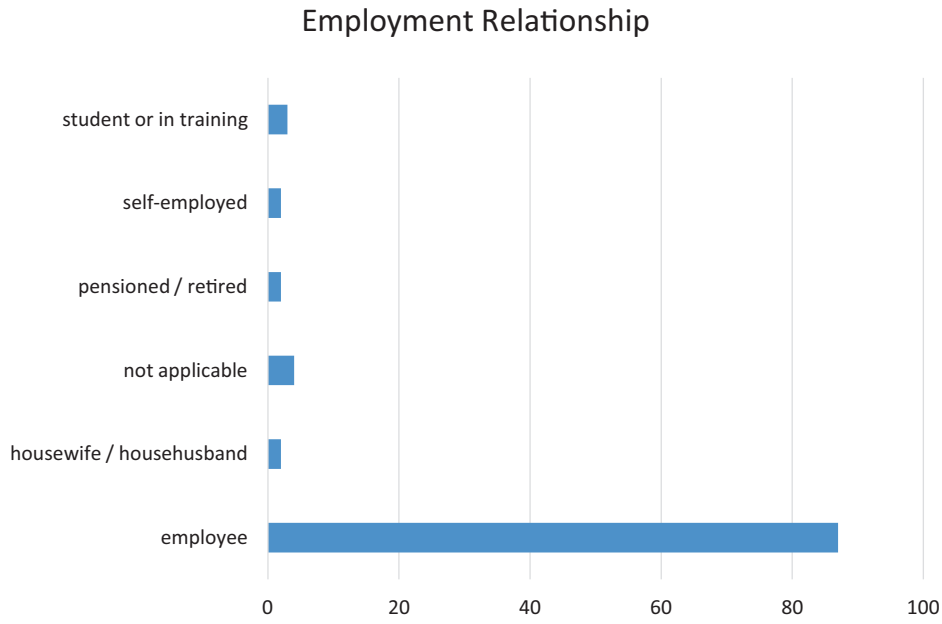

Fig. 5.13 Employment Relationships in the Main Activity

Degree of Employment

54 participants worked full-time, while many were not able to work due to being in rehabilitation or due to health reasons. The details can be seen in Fig. 5.14.

Duration of Disability

The duration of occupational disability in years can be seen in Fig. 5.15. Most of the participants have had occupational issues for one and a half years.

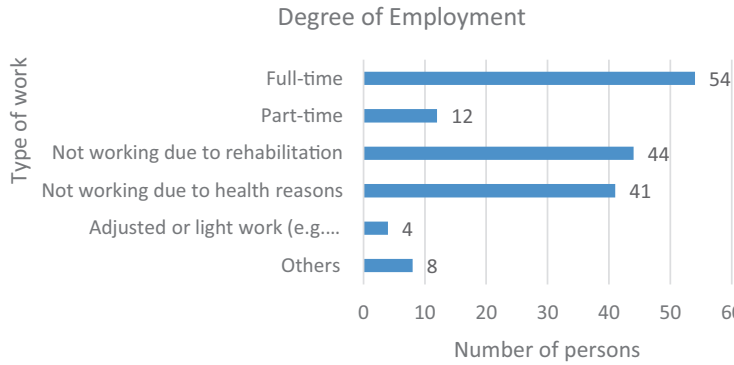

Fig. 5.14 Degree of Employment

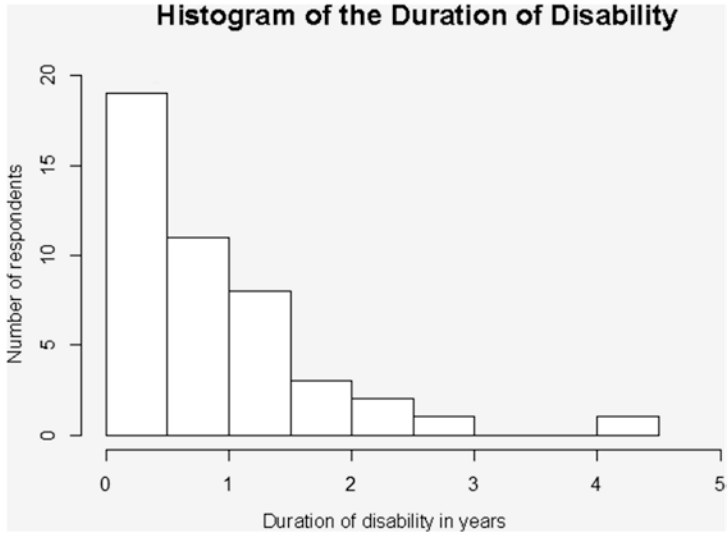

Fig. 5.15 Duration of Disability (WORQ SR GG)

Reliability Analysis

The WORQ GG showed a Cronbach's Alpha value of 0.94 with a sample size of 163 participants and 36 items, representing high internal consistency. This is also acceptable compared to the Cronbach's Alpha value of 0.88 in Finger et al. (2013, p. 507) having a sample size of 74.

Mean Complaint Level

The mean level of complaints from part 2 of the WORQ is displayed for BGU (Fig. 5.16), KR (Fig. 5.17) and BGU and KR combined (Fig. 5.18) (BGU). The figures display the increase in complaint intensities from left to right. The combined scores show that pain is the most severe symptom complaint, followed by general stamina, sleeping function and moving in another way.

The participants in the BGU clinic scored above the mean value of 5 for eight categories of which moving in another way was highest, while the participants in KR clinic reported fewer complaints above the mean value of 5 (pain and sleeping function). Comparing the BGU and KR reveals the former scores higher in all selected categories (Table 5.5).

Group Comparison by Gender of all Items According to WORQ SR GG

The comparison of men and women indicates that women seem to score higher than men (Table 5.6).

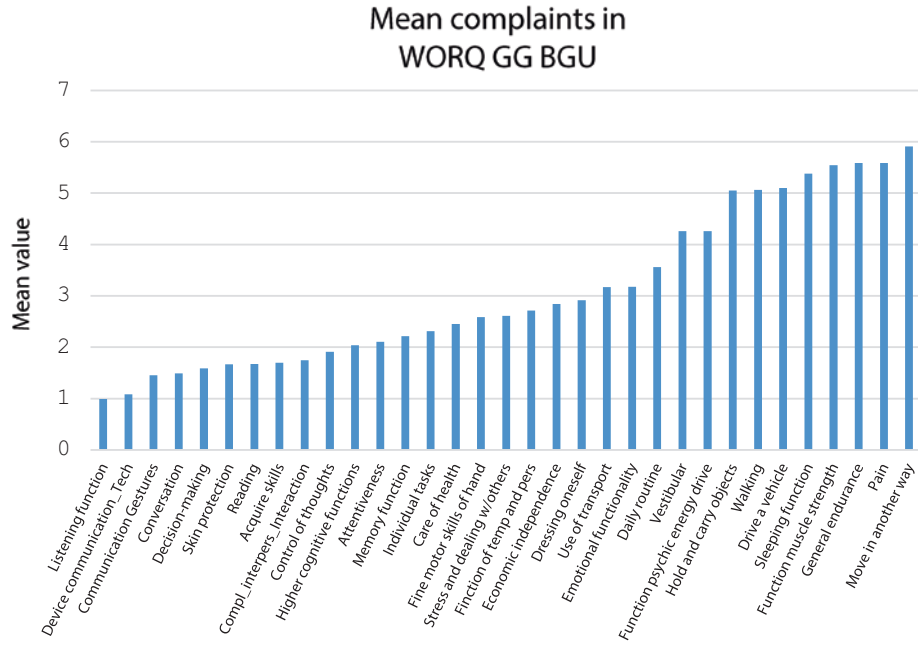

Fig. 5.16 Mean Complaint Type, items in the BGU on the WORQ SR GG

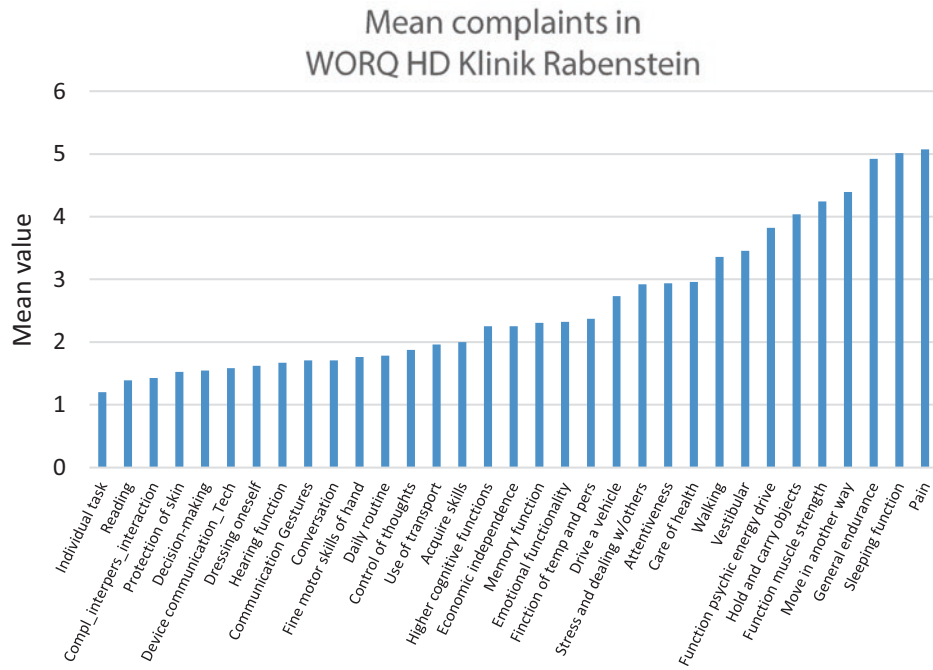

Fig. 5.17 Mean Complaint Type, items in the Klinik Rabenstein on the WORQ SR GG

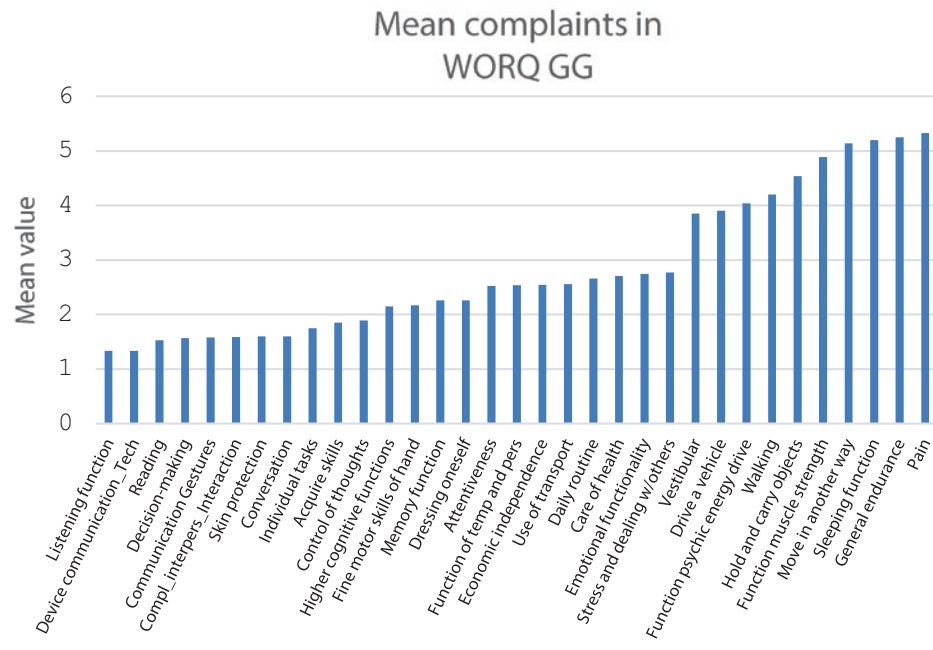

Fig. 5.18 Mean Complaints on the WORQ SR GG items

Table 5.5 Mean Complaints Comparing the BGU and KR on the WORQ SR GG

Items	Mean BGU	Mean KR	t-Value	p-Value	Power
Muscle strength function	5.55	4.24	t(153.96) = 2.765	p = 0.006	0.78
Specific task	2.31	1.20	t(135.56) = 2.608	p = 0.010	0.74
Daily routine	3.56	1.78	t(134.28) = 3.696	p < 0.001	0.96
Using transportation	3.17	1.96	t(142.04) = 2.206	p = 0.029	0.59
Driving a vehicle	5.10	2.73	t(149.77) = 3.509	p = 0.001	0.94
Getting dressed	2.92	1.62	t(146.64) = 2.887	p = 0.005	0.82
Walking	5.06	3.36	t(151.16) = 2.962	p = 0.004	0.84
Moving about	5.91	4.39	t(152.979) = 2.480	p = 0.014	0.69

Table 5.6 Comparing Scores for Men and Woman on the WORQ SR GG

Items	Mean (Men)	Mean (Women)	t-Value	p-Value	Power
Function of temperament and Personality	2.23	3.36	t(67.517) = –2.587	p = 0.012	0.87
Function of psychic energy and drive	3.75	4.87	t(67.658) = –2.064	p = 0.043	0.70
Sleep function	4.79	6.16	t(78.829) = –2.272	p = 0.026	0.71
Memory function	1.94	3.11	t(63.261) = –2.083	p = 0.041	0.74
Control of thoughts	1.58	2.70	t(62.493) = –2.161	p = 0.034	0.78
Higher cognitive functions	1.83	3.00	t(69.261) = –2.375	p = 0.020	0.80
Function of muscle strength	4.59	5.66	t(82.106) = –2.052	p = 0.043	0.61
Decision-making	1.25	2.41	t(59.446) = –2.493	p = 0.015	0.78
Daily routine	2.29	3.66	t(67.766) = –2.326	p = 0.023	0.80
Dealing with stress and others	2.32	3.95	t(67.636) = –2.964	p = 0.004	0.80
Use of transport	2.23	3.44	t(67.712) = –1.838	p = 0.070	0.94
Getting dressed	1.88	3.27	t(64.524) = –2.508	p = 0.014	0.87

Correlation Analysis of 11 DIAMO Dimensions with 36 items (34 dimensions) WORQ SR GG

The results of the correlational analysis between the 11 DIAMO and the 34 WORQ GG dimensions are described below.

- The DIAMO target inhibition correlates with the WORQ GG item ‘d240, handling stress and other psychological requirements’ (r = 0.33)
- The DIAMO target inhibition correlates with the WORQ GG item ‘d3503, talking to a person’ (r = 0.31).

- The DIAMO target inhibition correlates with the WORQ GG item ‘d3150 communicating as a receiver of hand signs or gestures’ (r = 0.3).
- The DIAMO dimension failure avoidance correlates with the WORQ GG item ‘d3150, communicating as a recipient of gestures or gestures’ (r = 0.29).
- The DIAMO dimension work incentive and desire for change (AV) correlates with the WORQ GG item ‘d210, adopt a single task’ (r = 0.29).
- DIAMO target inhibition correlates with the WORQ GG item ‘b164, higher cognitive functions’ (r = 0.28).
- The DIAMO dimension work incentive and desire for change (AV) correlates with the WORQ GG item ‘d475, driving a vehicle’ (r = 0.27).
- The DIAMO dimension work incentive and desire for change (AV) correlates with the WORQ GG item ‘d540, dressing oneself’ (r = 0.27).
- The DIAMO load factor (BL) in the workplace correlates with the WORQ GG item ‘b164, Higher cognitive functions’ (r = 0.27).
- The DIAMO target inhibition correlates with the WORQ GG item ‘d160, focus attention’ (r = 0.27).
- The DIAMO dimension settings for work correlates with the WORQ GG item ‘d430, lifting and carrying objects’ (r = 0.27).
- The DIAMO dimension settings for work correlates with the WORQ GG item ‘d475, driving a vehicle’ (r = 0.26).
- The DIAMO dimension settings for work correlates with the WORQ GG item ‘d540, dressing’ (r = 0.26).
- The DIAMO target inhibition correlates with the WORQ GG item ‘b126, functions of temperament and personality’ (r = 0.26).
- The DIAMO target inhibition correlates with the WORQ GG item ‘d177, making decisions’ (r = 0.26).
- The DIAMO load factor (BL) in the workplace correlates with the WORQ GG item ‘d3503, talking to a person’ (r = 0.26).

Correlations Between Age and DIAMO

The correlational analysis between age and DIAMO reveals the following findings:

- The work attitudes (EA) correlate negatively with age (r = - −0.29).
- The target activity (ZA) correlates negatively with age (r = - −0.34).
- The work incentive and desire for change (AV) correlates negatively with age (r = - −0.28).

Finally, an exploratory correlation analysis was carried out between the Depression Core Set in the WORQ SR GG with DIAMO and a significant correlation between target inhibition and Psychiatric Core Set (r = 0.303).

Comparing BGU and KR on DIAMO

The DIAMO factor 'attitude to work' ($t(152,99) = 2.80$, $p = 0.006$) differs between participants at the BGU (mean = 3.80) and KR (mean = 3.44). The factor 'target activity' differs also between ($t(152,31) = 2.63$, $p = 0.009$; BGU, mean = 3.98; KR, mean = 3.68) as well as 'work desire change request' ($t(144.86) = 2.026$, $p = 0.04$; BGU, mean = 3.07; KR, mean 2.85).

5.4 Discussion

The results of the WORQ SR GG and the DIAMO show that both questionnaires can be used to target suitable rehabilitation measures. For data protection reasons, the collected data could only be evaluated at the group level. An individual analysis in electronic form, administered at regular intervals, could contribute to improving RTW for each participant through optimizing communication and documentation and gaining new insights. On the basis of the current results, there seem to be differences between the rehabilitation programs at the BGU and KR. Common to all programs is that insufficient sleep, which is often compensated by medication, has more impact on functioning compared to the other ICF categories.

The association between the target inhibition of the DIAMO and the item 'dealing with stress and other mental demands' of the WORQ SR GG, indicates that a stronger focus on coping strategies within the rehabilitation setting must be addressed, so that the patients' re-entry-into-the-work process can be facilitated. Any implementation of new interventions should carefully consider the mental models of patients representing the whole setting.

The gender and age-specific relationships between the complaints arising from the ICF questionnaires, the WORQ SR GG and the DIAMO work motivation questionnaire need to be further investigated. The focus could be on the contextual factors. The workplace-specific conditions in companies could be further investigated for factors that favour or inhibit RTW. The prolonged sickness absence of employees from the work process leads to many social and financial challenges in the age of accelerated adjustment (Arbeit 4.0). Thus, the likelihood that workplace processes, work requirements, and departmental structures have changed noticeably at the time of reentry into employment may have considerably increased during individuals' sick leave or rehabilitation process. Especially in the current phase of corporate restructuring, it is therefore important for rehabilitants to stay in contact with the workplace during the entire rehabilitation process and to be informed of and, if necessary, to be involved in first-hand changes in one's own workplace. This promotes the commitment to the company, which represents a gain for the company in the current situation of skill shortages. On the other hand, a high fluctuation of employees leads to rising costs, simply because of the long training periods required.

Table 5.7 Proposed Measures for the Five Strongest Average Complaints

Mean order of expression	Ailment	Proposed measures
1.	Pain	Osteopathy, acupuncture, acupressure, medicines, tapping, Tai Chi, Kneipp treatments, yoga
2.	General endurance	Cognitive and physical endurance training (e.g., running, cycling), games, group exercises
3.	Sleep	Yoga, autogenic training, breath and relaxation exercises, fresh air, schedule, sleep laboratory, behavioral training, Tai Chi
4.	Function to move in a different way	Physiotherapy, occupational therapy, strength training, swimming, walking school, movement and coordination, osteopathy
5.	Function of muscle strength	Strength and endurance training

Taking into account the results of the present study, participants from BGU and KR might benefit from a number of obvious proposed measures with regard to the average severity of their worst complaints. These are suggested in Table 5.7 in descending order, with no claim to completeness.

Sleep is one of the most important prerequisites for mental and physical health. The need for restful sleep was indicated by participants at both clinics. In the current sample, lack of sleep seems to affect symptoms of pain, general stamina, function to move in a different way, and the function muscle strength, also negatively contributing to tensions in the family and at work. The effects of sleep disorders can negatively affect cognitive functions such as concentration, pain, sensation of pain, and spontaneous pain (Schuh-Hofer et al. 2016) as well as heart problems, weakening of the immune system, fat cells, stomach, joints and muscles (Schuh-Hofer et al., 2016). See Fig. 5.19 for a summary.

5.5 Conclusion

It was not examined whether the differences between the rehabilitation programs of the BGU and the KR lead to different RTW results. This might be explored in a long-term WORQ study. In addition, the introduction of the ZAZO (Zielanalyse and Zieloperationalisierung, standing for target analysis and operationalisation) training concept in the clinics could address the specific needs of each group in a customer-oriented manner. In doing so, information influencing RTW could be analysed more precisely. A number of further research questions are connected with the investigations carried out in the present work, e.g.:

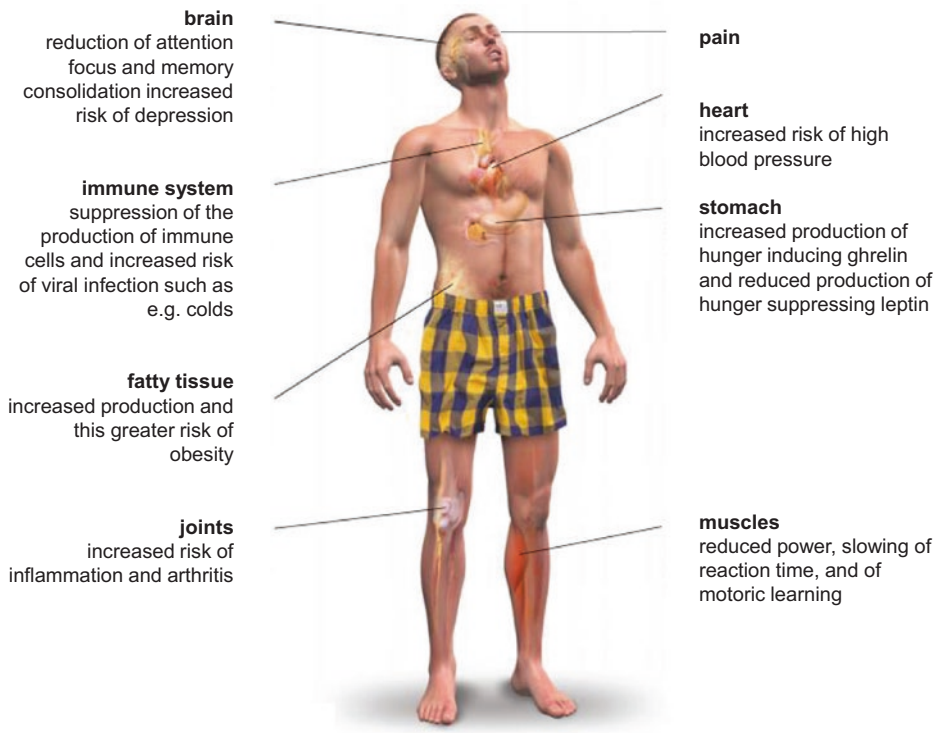

Fig. 5.19 Possible Effects of Sleep Deprivation. (*Source* Adapted from Myers, 2014 p. 108)

- Effects on job satisfaction among male and female rehabilitees after RTW
- Tailoring occupational rehabilitation for part-time employees over the age of 65 with regard to RTW
- Impact of school education or vocational training on RTW? Age-specific industry differences in RTW

In a long-term study, the integration of the WORQ SR GG into the rehabilitation process would most likely lead to further evidence-based improvements of the whole rehabilitation process. The latter could support the planned amendments to the SGB IX on 01.01.2023.

References

Albert, N.G., (trans.) Erber, G., & Peniston, W. (2016). *Lesbian Decadence: Representations in art and literature of fin-de-siècle France*. New York: Harrington Park Press.

Becker, K.B. (09. Februar 2016). Kassen wollen Daten von Fitness-Armbändern nutzen. Der Patientenbeauftragte der Bundesregierung pocht aber auf Freiwilligkeit, die Ärzte lehnen den Vorstoß strikt ab. *Süddeutsche Zeitung,* 4.

Belzl, H. (2006). Physiotherapie nach Verletzung. *Trauma und Berufskrankheit, 8*(Suppl 1), 87–89.

Bering, R., & Schmidt-Ohlemann, M. (2013). Implementierung der Internationalen Klassifikation der Funktionsfähigkeit, Behinderung und Gesundheit (ICF) zur Klassifizierung von psychischen Beeinträchtigungen. *Deutsche Vereinigung für Rehabilitation DVfR, November* (S. 1–17).

Bethge, M. (2011). Erfolgsfaktoren medizinisch-beruflich orientierter orthopädischer Rehabilitation. *Rehabilitation, 50*(03), 145–151.

Bickenbach, J. (2012). Was ist die Funktionsfähigkeit und warum ist sie von Bedeutung. In: J. Bickenbach (Hrsg.), *Die ICF-Core-Sets. Manual für die klinische Anwendung.* Programmbereich Gesundheit (1. Aufl., S. 4–7). Bern: H. Huber.

Bofinger, P., Feld, L. P., Schmidt, C. J., Schnabel, I., & Wieland, V. (2016). *Zeit für Reformen. Jahresgutachten 2016/17*. Bonifatius GmbH Druck-Buch-Verlag.

Braun, M. (2016). Arbeit 4.0 menschengerecht gestalten. Schwerpunkt. *Betriebliche Prävention, 2016*(01), 13–18.

Bundesministerium für Arbeit und Soziales. (Hrsg.). (2016). *Rehabilitation und Teilhabe behinderter Menschen.* https://www.bmas.de/SharedDocs/Downloads/DE/PDF-Publikationen/a990-rehabilitation-und-teilhabe-deutsch.pdf?__blob=publicationFile. Accessed 11 Feb 2020.

Deck, R., Zimmermann, M. & Raspe, H. (2008). FREM-17. In *Diagnostische Verfahren in der Rehabilitation* (Diagnostik für Klinik und Praxis, Bd. 5, S. 98–100). Göttingen: Hogrefe.

Deutsche Rentenversicherung Bund. (Hrsg.). (22. August 2006). *Anforderungsprofil für eine stationäre Einrichtung zur medizinischen Rehabilitation mit 100 Rehabilitationsplätzen und Zulassung zum AHB-Verfahren,* Dezernat 8023, Zusammenarbeit mit Reha-Einrichtungen, Medizin/Psychologie, Abteilung Rehabilitation, Deutsche Rentenversicherung Bund. http://www.deutsche-rentenversicherung.de/BraunschweigHannover/de/Inhalt/2_Rente_Reha/02_Reha/05_Fachinformationen/03_Infos_Reha_Einrichtungen/profil_zulassung_ahb_I.pdf.pdf?__blob=publicationFile&v=3. Accessed 11 Feb 2020.

Deutsche Gesetzliche Unfallversicherung und Sozialversicherung für Landwirtschaft, Forst und Gartenbau (Hrsg.). (01. Juli 2016). *Berufsgenossenschaftliche Stationäre Weiterbehandlung (BGSW). Anforderungen.* http://www.dguv.de/medien/landesverbaende/de/med_reha/documents/bgsw2.pdf. Accessed 11 Feb 2020.

ECJ. (12/18/2014, case C-354/13). ECLI:EU:C:2014:2463, http://curia.europa.eu/juris/document/document.jsf?docid=160935&doclang=EN. Accessed 14 Dec 2019.

Faller, H., & Vogel, H. (2008). FEZ. In *Diagnostische Verfahren in der Rehabilitation: Bd. 5.* Diagnostik für Klinik und Praxis (S. 87–89). Göttingen: Hogrefe.

Fiedler, R. G., Ranft, A., Greitemann, B., & Heuft, G. (2008). DIAMO. In: *Diagnostische Verfahren in der Rehabilitation: Bd. 5. Diagnostik für Klinik und Praxis* (S. 364–367). Göttingen: Hogrefe.

Finger, M., & Escorpizo, R. (2016a). *Work Rehabilitation Questionnaire Self-Report,* ICF Research Branch. Swiss Paraplegic Research. http://www.myworq.org/quest/nrs/WORQ_SR_NR_German.pdf. Accessed 11 Febr 2020.

Finger, M., & Escorpizo, R. (2016b). *Work Rehabilitation Questionnaire Self-Report. Brief.* Swiss Paraplegic Research. http://www.myworq.com/quest/nrs/WORQ-Brief_SR_NR_German.pdf. Accessed 11 Febr 2020.

Finger, M. E., Bie, R. de, Nowak, D., & Escorpizo, R. (2015). Development and testing of an ICF-based questionnaire to evaluate functioning in vocational rehabilitation: The Work Rehabilitation Questionnaire (WORQ). Chapter 23. In: R. Escorpizo, S. Brage, D. Homa & G. Stucki (Hrsg.), *Handbook of vocational rehabilitation and disability evaluation. Application and implementation of the ICF: Handbooks in health, work, and disability* (S. 495–520). Cham: Springer.

Finger, M. E., Escorpizo, R., Bostan, C., & Bie, R. D. (2013). Work rehabilitation questionnaire (WORQ): Development and preliminary psychometric evidence of an ICF-based questionnaire for vocational rehabilitation. *Journal of Occupational Rehabilitation, 24,* 498–510.

Glassel, A., Rauch, A., Selb, M., Emmenegger, K., Luckenkemper, M., & Escorpizo, R. (2012). A Case Study on the Application of International Classification of Functioning, Disability and Health (ICF)-based tools for vocational rehabilitation in spinal cord injury. *Work (Reading, Mass.), 41*(4), 465–474.

Grawetter, F., & Wallnau, L. (2009). *Statistics for the behavioral sciences*. Belmont: Wardsworth.

Hartz, P., & Petzold, H. G. (2014). Das Gesundheitscoaching. In P. Hartz & H. G. Petzold (Hrsg.) *Wege aus der Arbeitslosigkeit. MINIPRENEURE; Chancen um das Leben neu zu gestalten – zur Bewältigung von Langzeitarbeitslosigkeit. Integrative Modelle in Psychotherapie, Supervision und Beratung* (Aufl. 2014). Wiesbaden: Springer VS.

Klein, C. (2015). *Psychosoziales Gesundheitsmanagement für Führungskräfte*. Igel Verlag RWS.

Maschke, M. (2008). Vergleich der Definitionen in europäischen Behindertenpolitiken. In K.-S. Rehberg & D. Giesecke (Hrsg.), *Die Natur der Gesellschaft. Verhandlungen des 33. Kongresses der Deutschen Gesellschaft für Soziologie in Kassel 2006:* Bd. 33. *Verhandlungen des … Kongresses der Deutschen Gesellschaft für Soziologie* (S. 5773–5784). Frankfurt/Main: Campus.

Myers, D.G. (2014). *Psychologie*. Berlin, Heidelberg: Springer.

Neuntes Buch Sozialgesetzbuch - Rehabilitation und Teilhabe behinderter Menschen -. SGB IX. (Bundesgesetzblatt i. d. F. vom 2001 BGBl. l, S. 1046, 1047; zul. geä. am 2016 BGBl. l, S. 1824, 1837). In *Bundesgesetzblatt* (§ 2). https://dejure.org/gesetze/SGB_IX/2.html. Accessed 11 Feb 2020.

Nübling, R., Hafen, K., Kriz, D., Herwig, J., Töns, N., & Bengel, J. (2008). PAREMO. In: *Diagnostische Verfahren in der Rehabilitation: Bd. 5. Diagnostik für Klinik und Praxis* (S. 101–104). Göttingen: Hogrefe.

Nübling, R., & Scholz, H. (2008). FPTM. In: *Diagnostische Verfahren in der Rehabilitation: Bd. 5. Diagnostik für Klinik und Praxis* (S. 93–97). Göttingen: Hogrefe.

Rauch, A., Lückenkemper, M., & Cieza, A. (2012). Einführung in die Internationale Klassifikation der Funktionsfähigkeit, Behinderung und Gesundheit. In: J. Bickenbach (Hrsg.), *Die ICF-Core-Sets. Manual für die klinische Anwendung.* Programmbereich Gesundheit (1. Aufl., S. 8–20). Bern: Huber.

Reha-Info. (1/2016). *Die Rehabilitation, 55,* 1–8. Reha-Info zur Zeitschrift Die Rehabilitation. https://www.bar-frankfurt.de/service/reha-info/reha-info-archiv/reha-info-2016/reha-info-012016/editorial.html. Accessed 14 Dec 2019.

Schneider, W., Basler, H.-D., & Beidenherz, B. (2008). FMP. In: *Diagnostische Verfahren in der Rehabilitation: Bd. 5. Diagnostik für Klinik und Praxis* (S. 90–92). Göttingen: Hogrefe.

Schubert, Michael, Penstorf, Carola, Seel, H., Morfeld, M., Bade, S., Gleisberg, D., Jonßen, L. et al. (Bundesarbeitsgemeinschaft für Rehabilitation e. V. (BAR), (Hrsg.). (2014). *Abschlussbericht zum Projekt „Prüfung von aktuellem Stand und Potential der Bedarfsermittlung von Leistungen zur Teilhabe am Arbeitsleben unter Berücksichtigung der ICF (Machbarkeitsstudie)“.* http://www.bar-frankfurt.de/fileadmin/dateiliste/Startseite/Abschlussbericht_end_x.pdf. Accessed 14 Dec 2019.

Schuh-Hofer, S., Schäfer-Voß, S., & Treede, R. D. (2016). Schlaf und Schmerz. *Aktuelle Neurologie, 43,* 249–255.

Simmel, S., Beickert, R., & Bühren, V. (2014). Traumarehabilitation der Deutschen Gesetzlichen Unfallversicherung. Besondere Heilverfahren in den BG-Unfallkliniken. *Deutscher Ärzte-Verlag, 11*(3), 524–529. Trauma rehabilitation of the German Social Accident Insurance Special rehabilitation measures in the BG-trauma centers.

SGB. (2001). Sozialgesetzbuch (SGB) Neuntes Buch (IX) - Rehabilitation und Teilhabe behinderter Menschen -. SGB IX. http://www.gesetze-im-internet.de/sgb_9_2018/. Accessed 14 Dec 2019.

Statistisches Bundesamt. (2015, Tabelle Zeitreihe aktualisiert in 2021). *Gesundheit 2014. Diagnosedaten der Patienten und Patientinnen in Vorsorge- oder Rehabilitationseinrichtungen*. Fachserie 12, Reihe 6.2.2. Wiesbaden. https://www.destatis.de/DE/Publikationen/Thematisch/Gesundheit/VorsorgeRehabilitation/DiagnosedatenVorsorgeReha2120622147004.pdf?__blob=publicationFile. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2016a). *Gesundheitsausgaben. Gesundheitsausgaben im Jahr 2014 bei 328 Milliarden Euro.* https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Gesundheit/Gesundheitsausgaben/Gesundheitsausgaben.html. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2016b). *Gesundheitsausgaben im Jahr 2014 bei 328 Milliarden Euro*. Wiesbaden. https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2016/03/PD16_080_23611.html. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2016c). *19,2 Millionen Patienten 2015 stationär im Krankenhaus behandelt*. Wiesbaden (283/16).

Statistisches Bundesamt. (2016d). *7,6 Millionen schwerbehinderte Menschen leben in Deutschland. 381/16*. Wiesbaden. https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2016/10/PD16_381_227pdf.pdf;jsessionid=8DFE1237C00E438B6519D785FD49F478.cae2?__blob=publicationFile. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2017a). *Gesundheitsausgaben. Gesundheitsausgaben im Jahr 2015 um 4,5% gestiegen.* https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Gesundheit/Gesundheitsausgaben/Gesundheitsausgaben.html. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2017b). *März 2017: Erwerbstätigkeit mit stabilem Aufwärtstrend*. https://www.destatis.de/DE/PresseService/Presse/Pressemitteilungen/2017/05/PD17_145_132.html;jsessionid=86760E79C3C32B6C6606403BEC358AB4.cae3. Accessed 11 Feb 2020.

Statistisches Bundesamt. (2020). *Gesundheitsausgaben im Jahr 2018 um 4% gestiegen.* https://www.destatis.de/DE/Presse/Pressemitteilungen/2020/05/PD20_164_23611.html. Accessed 22 Apr 2020.

Stucki, G. (2012). Vorwort. In J. Bickenbach (Hrsg.), *Die ICF-Core-Sets. Manual für die klinische Anwendung:* Programmbereich Gesundheit (1. Aufl., S. 1–3). Bern: Huber.

Veith-Tezeren, C. (2017a). Überprüfung des ICF-basierten WORQ Fragebogens in der Bundesrepublik Deutschland und Evaluation in der beruflichen Rehabilitation. Masterthesis 2018 at FOM Hochschule GmbH, Essen.

Veith-Tezeren, C., Dittrich, W. H., Escorpizo, R. et al. (2017b). *Work Rehabilitation Questionnaire Self-Report (WORQ - German-Germany version).* http://myworq.org/quest/nrs/WORQ_SR_NR_German_Germany.pdf. Accessed 11 Febr 2020.

Veith-Tezeren, C., Dittrich, W. H., Escorpizo, R., et al. (2017c). *Work Rehabilitation Questionnaire Short-Self-Report (WORQ - German-Germany version).* http://myworq.org/quest/nrs/WORQ-Brief_SR_NR_German_Germany.pdf. Accessed 11 Febr 2020.

Vreeman, D. J., & Richoz, C. (2015). Possibilities and implications of using the ICF and other vocabulary standards in electronic health records. *Physiotherapy Research International: The Journal for Researchers and Clinicians in Physical Therapy, 20,* 210–219.

World Health Organization. (2001). *International classification of functioning, disability and health: ICF*. Geneva: World Health Organization.

World Health Organization. (2011). *World report on disability*. Geneva: World Health Organization.

Zumbeck, C. (2017). Mit 5 Schritten besser eingliedern. Für ein gutes Betriebliches Eingliederungsmanagement sind Ressourcen wie Wissen, Geld und Zeit nötig. Auch bessere externe Netzwerke und Beratung können die Umsetzung puschen. BEM-PRAXIS. *Gute Arbeit* (3), 14–16.

Zwerenz, R. (2008). FBTM. In *Diagnostische Verfahren in der Rehabilitation: Bd. 5. Diagnostik für Klinik und Praxis* (S. 84–86). Hogrefe.

Strategic Planning and Execution in Rehabilitation Using the Bio-Psycho-Social Approach

6

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Abstract

Common problems exist when it comes to strategic planning and execution in the business world as well as in the health care system. If one wants to be successful in this area it is important to be aware of those problems when innovating and implementing new ideas as well as being familiar with successful ways. There is a huge amount of new knowledge in rehabilitation that needs to be implemented into clinical practice. One has been the knowledge of the bio-psycho-social approach which involves that more emphasis is put on individual activity and participation outcomes, not just the impairment level. It is easier said than done to get professional, to stop looking at impairment level and to start looking at the individual from the bio-psycho-social approach. When putting the International Classification of Functioning, Disability and Health (ICF) system into clinical practice, some common thoughts/problems arose. An example of this was how to understand and use the common language provided by the ICF system, how to incorporate it, what measurement tools to choose if one wants to compare the function of an individual between two teams or different time zones, how to connect different measurement tools to different codes without losing their meaning, how to differentiate between the b and the d factors when it comes to overall functional loss, and how to use the qualifiers to give a good picture of the individual's strengths. It is important to pay more attention to the development of effective ways when the ICF system is incorporated into clinical practice.

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6.1 Introduction

Most countries have sound legislation and related policies within the field of rehabilitation. However, there are still some common problems in development, implementation and delivery of these policies. In many countries, strategic planning is lacking, which results in an uneven distribution of service capacity and infrastructure as well as a lack of agency responsible to administer, coordinate, and monitor the service (Kaplan & Norton, 2004). Other common problems are inadequate health information systems and communication strategies (Kaplan & Norton, 2004). This can result in low rates of participation in rehabilitation as well as complex referral systems. In return, this can limit access to the service and result in inappropriate referral and unnecessary medical consultations.

Absence of engagement with people receiving the service when it comes to design, implementation, and evaluation of rehabilitation programs is also viewed as a common problem in many countries (WHO, 2011). In the business world these challenges are better documented and the following statistics show that close attention is needed if one wants to be successful in getting important knowledge into practice (Kaplan & Norton, 2004):

- Less than 10% of strategies effectively formulated are effectively executed
- Only 10% of organizations execute their strategies
- Only 5% of the workforce understands the strategy
- Only 25% of managers have incentives linked to strategy
- 85% of executive teams spend less than one hour a month discussion strategy
- 37% of revenue targets are lost due to misalignment
- 60% of organizations fail to link budgets to strategy

A lot of material has been written about successful ways when it comes to strategic planning and execution. This knowledge should be used in a structured manner as a guidance, in business as well as in the health care system.

6.2 Bio-Psycho-Social Approach in Rehabilitation and the Measurement of Functioning

Traditionally, rehabilitation outcome measures have focused on the individual's impairment level, but today more emphasis is put on individual activity and participation outcomes. An assessment of functioning is always the starting point of a patient and goal-oriented rehabilitation process.

An important part of the assessment is the measurement of activity and participation outcomes, the individual's performance across a range of areas (WHO, 2011). This is in accordance with Nordenfelt's statement; a quantified measure of degree of impairment

related to separate diseases or injuries cannot give an answer to the question that concerns the overall disability of a person. Nordenfelt further stated:

> *In general, a specific impairment can have an effect on one person which is so different from the effect of the same impairment on another person that the impairment itself cannot function as a reasonable criterion for decisions in the medical insurance system. A person impairment may but need not lead to an activity limitation and an activity limitation may but need not lead to a participation restriction. (*Nordenfelt, 2008)

Another important thing to keep in mind is that activity limitation not only depends on physical impairment, but also on the type of work and kind of life that the person lives. This, in return, depends on the individual's wishes and goals in life. The conclusion of this observation is that disability needs to be assessed much more on an individual basis than has been the case so far (Nordenfelt, 2008). The internal processes of the individual, the goals and the surrounding nature are important elements. An individual's participation restriction, or activity limitation, cannot be understood without reference to the individual's own view of the situation and his/her own goals. Therefore, it is not possible to make a description or assessment of the individual disability unless his or her voice is heard and involved in the description and evaluation (Solli, 2007).

Activating measures and increased focus on what the individual can do has shown to be effective in getting people back to work (OECD, 2010). It is also important to reform assessment methods when it comes to lowering disability claims (OECD, 2007, 2008).

6.3 Integration of ICF in Work Ability Assessment

In Iceland, a continuum growth in disability benefit is a fact as in many other countries as well. As a consequence, assessment procedures and partial disability benefits have come under reconsideration. The Prime Ministry in Iceland (2007) indicated a work of a group of specialists reviewing the focus and assessment methods of eligibility for disability benefits. They also stated the necessity of different assessment methods focusing on what people can do, not what they cannot do (The Prime Ministry, 2007). In the continuum, a group of professionals was assembled to assist in searching for methods and ways to assess work ability. A draft for work ability assessment was introduced in September 2009. One conclusion of that group was to use the International Classification of Functioning, Disability and Health (ICF) as a theoretical framework for the work ability assessment (Ministry of Social Affairs and Social Security, 2010). Function is the key word in ICF as it looks at the individual in the community in which he/she lives, regardless of what caused the impairment (WHO, 2001). As a result, ICF provides a multi-perspective approach and serves as a very helpful tool in connection to the bio-psycho-social approach.

This work marked the beginning of further development of the work ability assessment which has been object of many theses and research. One of them is a master thesis

published in 2011 (Konráðsdóttir, 2011) and further described in the chapter about work disability assessment in The Handbook of Vocational Rehabilitation and Disability Assessment (Escorpizo et al., 2015).

There are diverse assessment methods and instruments in use, many with different aims. EUMASS (the European union of social security doctors) used the ICF system to develop a Core Set for functional assessments in disability benefit claims i.e. for long-term restrictions in work participation. It contains 20 categories of ICF—5 regarding body functions, and 15 regarding activities/participation. This Core Set was intended to be used by medical doctors in the evaluation of rights for long term benefits (Brage et al., 2008).

One of the ideas that was put forward by Konráðsdóttir was that it could be useful to apply the EUMASS Core Set early in the rehabilitation, that way you can work systematically with important functional factors through the process to receive a maximum functional level before a decision is made on disability (Konráðsdóttir, 2011).

Specific ICF tools have been developed that can be integrated into the rehab-cycle as a problem solving approach and can be useful for a multidisciplinary team. By using existing ICF Core Sets and ICF qualifiers these ICF tools allow the description of the function of the individual and should support a common understanding of functioning (Rauch et al., 2008).

6.4 Implementing the ICF System in Clinical Practice

There are known problems both in rehabilitation and the business world when it comes to strategic innovation and execution of a strategy. It is the author's experience that this is particularly important to keep in mind if a strategy involves a new approach or different thinking. It is easier said than done to stop looking at the impairment level and rather start regarding the individual with the bio-psycho-social approach. In the following, some common thoughts, questions and problems when integrating the ICF into clinical practice are listed:

> *"How do we use the standard language of the ICF system as common knowledge in a multidisciplinary team and clinical practice?"*

The ICF system provides a standard language and framework for the description of health and health-related states. Each code in the system is followed by an international explanation of what it means. But is it easy to understand and use it in clinical practice? Let's have a look at the explanation for one code in the chapter body functions and structure:

> *"General mental functions of periodic, reversible and selective physical and mental disengagement from one's immediate environment accompanied by characteristic physiological changes."*

Table 6.1 Example of the B and D Part of the ICF System

b710 Mobility of joint functions	d455 Hand and arm use
Functions of the range and ease of movement of a joint	Performing the coordinated actions required to move objects or to manipulate them by using hands and arms, such as when turning door handles or throwing or catching an object

Which function is being described? Is it practical to use this standard language in clinical practice? For those who did not come up with the answer, this is a description of the code b134, sleep functions.

> *"How do we differentiate between different parts of the ICF system when it comes to a standardized measurement of work ability?"*

One thing that is common with all developed Core Sets is that they are using codes from different parts of the system. In the EUMASS Core Set, for example, we have both b and d parts. The EUMASS Core Set includes both b710 and d455. Individuals with a frozen shoulder will therefore show problems in b710, mobility of joint functions. That problem is probably also going to be described in d455, hand and arm use (see Table 6.1). Should we then double the problem in a standardized measurement of work ability or try to differentiate between the b and the d part?

6.5 Use of Measurement Tools

Clinicians in different teams should keep in mind that when working within the same protocol the overall assessment of function of the individual has to be comparable between different teams and different time zones. As an example, we could easily encounter two different teams looking at the same problem deciding to use different measurement tools and guides to qualify different codes (Table 6.2). Will we get the same result when using the qualifiers to get a clear picture of the functional loss of that individual?

Table 6.2 Two Different Approaches in Measuring Activity Level for an Individual with Back Pain

Team 1-measurement of activity level	Team 2-measurement of activity level
Berg Balance Scale	Bending forward and backward
Timed Up and Go	Trunk twisting
Timed Sit to Stand	Transfers
Functional Reach Test	Walking (sit, stand, laying down)

6.6 How to Match Different Measurement Tools to Different Codes Without Losing Their Meaning?

An update of the linking rules within the ICF was published in 2005. Four new linking rules were established, three rules to link health-status measures and one to link technical and clinical measures and interventions (Cieza et al., 2005). Still, in clinical practice this is not always easy to do. There are many tools in clinical practice that are designed to answer the question whether an individual fulfills sudden clinical criteria or not. In the psychological field for example, we have quite a lot of instruments that are very well studied and widely accepted. An example is GAD-7, Generalized Anxiety Disorder. Higher score has been connected to the severity of anxiety and has been shown to correlate with disability and functional impairment (see link: http://www.mdcalc.com/gad-7-general-anxiety-disorder-7/). If we are using measurement tools like this which can be connected to more than one code, how do we incorporate them to the codes within the ICF system without losing their meaning?

6.7 How to Change from a Problem Approach to an Approach Focusing on Possibilities?

To quantify the functional impairment, the use of the qualifiers in the ICF is recommended; a qualifier states the magnitude or severity of the problem in question. They also serve as a sitemap to identify the impairment and thereby support the understanding of function. This is also helpful when a multidisciplinary team is working together in the assessment. It enables all team members to get a common language (Rauch et al., 2008). Looking at the explanation of using the qualifiers, they refer to an impairment, limitation, restriction or barrier (Table 6.3).

As can be seen, the explanation for each qualifier is in connection with the extent of the problem/functional loss of the individual involved. The fundamental question is how this is related to strengths or can be used as a sitemap to inform clinicians of the capacities of this individual in contrast to his or her functional limitations.

Table 6.3 Qualifiers within the ICF System

Qualifier	Explanation
0	NO problem
1	MILD problem
2	MODERATE problem
3	SEVERE problem
4	COMPLETE problem

6.8 Conclusion

It is known that there are some common problems in strategic planning and execution in the business world as well as in the health care system. It is important to be aware of those problems if one wants to be successful in finding new ideas and put them into practice. It is the author's experience that this is particularly important to keep in mind if an idea involves a new approach or different thinking. Many papers have been written and a lot of research has been conducted on the ICF model but very few on the experience of implementing it into clinical practice. The experience described in this chapter shows that it is easier said than done to incorporate the model into clinical practice. Therefore, it is important to pay more attention to the development of effective ways when the ICF system is incorporated into clinical practice.

References

Brage, S., Donceel, P., & Falez, F. (2008). Development of ICF core set for disability evaluation in social security. *Disability and Rehabilitation, 30,* 1392–1396.

Cieza, A., Geyh, S., Chatterji, S., Kostanjsek, N., Ustun, B., & Stucki, G. (2005). ICF linking rules: an update based on lessons learned. *Journal of Rehabilitation Medicine, 37,* 212–218.

Escorpizo, R., Brag, S., Homa, D.,& Stucki, G. (2015). Handbook of vocational rehabilitation and disability assessment: Application and implementation of the ICF. New York.

Kaplan, R. S., & Norton, D. P. (2004). *Strategy maps: converting intangible assets into tangible outcomes.* Harvard Business Press.

Konráðsdóttir, A. D. (2011). *Work ability assessment, a description and evaluation of a new tool in vocational rehabilitation and disability claim.* University of Bifröst.

Ministry of Social Affairs and Social Security. (2010). *Drög að starfshæfnismati. Skýrsla faghóps um aðferðir við mat á starfshæfni.* Minsitry of Social Affairs and Social Security. http://www.felagsmalaraduneyti.is/media/acrobat-skjol/Drog_ad_starfshaefnismati06112009.pdf. Accessed 15 Jan 2016.

Nordenfelt, L. (2008). *The concept of work ability.* P.I.E. Peter Lang.

OECD. (2007). *New ways of addressing partial work capacity.* OECD thematic review on sickness, disability and work. http://www.oecd.org/dataoecd/6/6/38509814.pdf. Accessed 10 Feb 2020.

OECD. (2008). *Modernising sickness and disability policy*. OECD thematic review on sickness, disability and work. http://www.oecd.org/dataoecd/5/62/40495992.pdf. Accessed 10 Feb 2020.

OECD. (2010). *Sickness, disability and work: Breaking the barriers.* A Synthesis of Findings across OECD Countries.

Rauch, A., Cieza, A., & Stucki, G. (2008). How to apply the International Classification of Functioning Disability and Health (ICF) for rehabilitation management in clinical practice. *European Journal of Physical and Rehabilitation Medicine, 44,* 329–342.

Solli, H. M. (2007). *Rettferdighet og objektivitet I trygdemedisinske uførhetsvurderinger; En etisk og vitenskapsfilosofisk analyse av tre uførhetsmodeller I et historisk perspektiv.* Institute of Health and Society, Faculty of Medicine, University of Oslo.

The Prime Ministry. (2007). *Skýrsla nefndar um endurskoðun örorkumats og eflingu starfsendurhæfingar.* http://www.ll.is/files/bbhdcgdfgf/Lokaskyrsla_orokubotanefndar_forsatisradherra.pdf. Accessed 10 Feb 2020.

World Health Organization. (2001). International classification of functioning, disability and health. World Health Organization.

World Health Organization. (2011). *The world report on disability*. World Health Organization.

Part II

Return to Work

Return to Work of Sick-Listed People After Vocational Rehabilitation in Germany

7

Nancy Reims

Abstract

Societal participation of persons with disabilities is one central concern of modern welfare states. The integration into the labor market is one important aspect. Vocational rehabilitation for people with disabilities or (occupational) health limitations is a key societal instrument in order to achieve (sustainable) labor market reintegration. However, there is a lack of empirical evidence on how successful vocational rehabilitation is in terms of reintegration rates and sustainability of labor market reintegration. The following contribution presents the specifics of the German system of vocational rehabilitation and its particular relevance related to demographic changes in Germany. Furthermore, a study on return to work after vocational rehabilitation is presented. The results are based on a panel survey of vocational rehabilitants, who completed various labor market programmes at the German Federal Employment Agency in 2006. The survey was first carried out in 2007 and continued in two additional waves in 2008 and 2010. Event history analyses are applied to investigate (1) the reintegration into the labor market and (2) the sustainability of employment. Two thirds of the rehabilitants reintegrate quickly into the labor market. They are employed for almost three years on average. Younger age, mobility, access to occupational social networks and good subjective general health condition are positively associated with a faster labor market reintegration. On the other hand, individuals with a disability of the internal organs or psychological disabilities exit employment

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faster. These results show that reintegration into the labor market seems to be based on social selection processes and indicates exclusion mechanisms. Vocational rehabilitation is a key intervention in promoting and enhancing social and labor market participation. The findings of this study suggest that vocational rehabilitation seems to have an effect on labor market integration. However, the results also emphasize the heterogeneous nature of vocational rehabilitants and future investigations should attempt to systematically take this factor into account.

7.1 Introduction

Germany faces a drastic rise in the average age of the overall population. Due to this demographic change in age structure, a shrinking and ageing labor force can be observed. It is projected that this development is an ongoing process, even though immigration to Germany might mitigate the effects of demographic change to a certain, however, small extent (Fuchs & Söhnlein, 2013). In addition to a rise in population age, a rigorous rise in age within companies is projected in future decades. People within the age groups of 18 to 29, as well as people aged from 30 to 49 years will be represented decreasingly as opposed to people older than 50 years whose share within companies will increase until 2030 (Bundesarbeitsgemeinschaft für Rehabilitation (BAR), 2014). As age is highly associated with disabilities (Pfaff, 2012), there will be rising numbers of people with health restrictions and (severe) disabilities within the population and work force. These developments result in the central necessity of increasing the potential of the labor force by recruiting in particular women, disabled and older people into the labor market and to invest in education to obtain a skilled workforce. Furthermore, health restrictions due to ageing result in the necessity of higher investments in the health care system, since there will be an increasing demand for medical and vocational rehabilitation over time. The latter issue of increasing costs for medical and vocational rehabilitation (as well as social participation) is already observed in recent years (Bundesarbeitsgemeinschaft für Rehabilitation (BAR), 2014). Overall costs in 2004 were about 26 billion €, while current costs are in the region of 31 billion € with a rising tendency.

Though there are no exact and comprehensive records of the number of sick-listed people in Germany, data for people with registered disabilities are estimated to be approximately 10 million people in Germany (Marten, 2015). Only 50% are of working age, whereas 67% in the population of non-disabled are of working age. The labor force participation of the disabled is 54% compared to 80% for the non-disabled. This is partly due to a lower level of school and vocational education. Both, schooling degree and vocational degree are directly interrelated in Germany, i.e. a low level or lack of a school-leaving certificate impairs the possibility of obtaining vocational education. Furthermore, a vocational degree is essential in order to find employment. Associated with these disadvantages, disabled people have a higher risk of becoming unemployed

and their mean level of income is below the German average. Taking all the evidence together, there is an apparent and close correlation between disability and employment barriers in Germany.

7.2 Vocational Rehabilitation and Income Support

Comprehensive social participation of disabled people is explicitly and generally demanded by the UN convention on the rights of disabled people. Specifically, it is legally stated in the German Social Code—in particular in the Book IX "Rehabilitation and Participation of People with Disabilities"—with a major emphasis on the participation in working life. In order to promote social participation of disabled people and those at risk of becoming disabled, vocational rehabilitation (comprising medical, vocational and social rehabilitation) is one instrument of the German welfare state to stabilise people with health restrictions on a medical level and to prepare them for the demands of the labor market. Labor market integration is considered one way in order to guarantee societal participation. Employment—compared to unemployment—is, therefore, associated with manifest (income, social security benefits) and latent (social contacts, pursuit of common goals) functions (Jahoda, 1982).

The following contribution will focus on the context of vocational rehabilitation in Germany and its potential to bring promoted individuals back to work. It is not limited to people with a registered disability, but to people who are eligible for vocational rehabilitation. However, eligibility for vocational rehabilitation is associated with disabilities and health issues leading to limitations in social participation: "Under Book III of the German Social Code, people with disabilities are individuals whose prospects of participating or continuing to participate in the labor market are substantially impaired, other than temporarily, on account of a disability as defined in Sect. 2 (1) of Book IX of the German Social Code and who consequently need help participating in the labor market, including people with learning disabilities. People at risk of disability with similar consequences are deemed equivalent to people with disabilities." (Federal Ministry of Labor and Social Affairs, 2014, p. 24).

The contribution focuses on people in vocational reintegration, who are the financial responsibility of the Federal Employment Agency (FEA) (Dony et al., 2012). Those are relatively young people—on average at the end of their thirties—who have already obtained working experience for several years (mainly less than 15 years in employment liable to social security contributions). However, they are no longer able to continue their occupation due to a disability or health limitation. They might have lost their employment or might be in need for help in order to continue their employment. In Germany, there are different institutions financing vocational rehabilitation of disabled people that are responsible for different groups of rehabilitants. Besides the Federal Employment Agency, vocational reintegration is financed by the Statutory Pension Insurance, as well as the Statutory Accident Insurance, as one of the main financers of vocational

rehabilitation. People whose disability is due to a working accident, or who are contracting an occupational disease, are provisioned by the Statutory Accident Insurance. People who have accumulated more than 15 years of social security contributions, or who participated in medical rehabilitation before vocational rehabilitation, are financed by the Statutory Pension Insurance.

To receive vocational rehabilitation, an application has to be submitted to the institution responsible for financing vocational rehabilitation. Few clients with occupational limitations are familiar with vocational rehabilitation (Riedel et al., 2009), and gatekeepers are required to identify potential rehabilitation clients and to point them towards the possibility of vocational rehabilitation. Social practitioners at the workplace or personnel in the context of medical rehabilitation, as well as placement personnel of the FEA often function as gatekeepers due to their knowledge of institutional-specific processes and their networks (Ekert et al., 2012). If vocational rehabilitation is suggested by a general placement officer, potential rehabilitants are, ideally, forwarded to rehabilitation-specific departments. Those departments generally decide on acceptance or decline for benefits of vocational rehabilitation. Referral to vocational rehabilitation is mainly based on medical assessments made by the medical service of the FEA. The medical service observes, whether the applicant is disabled or at risk of becoming disabled. Besides the assertion of a medical impairment, the medical assessments inform about the extent and type of occupational limitation(s) due to the disability.

After the application to benefits of vocational rehabilitation is asserted, the rehabilitation-specific departments decide on the integration strategies in terms of labor market programmes in cooperation with the client. In the first place, the current occupational situation is to be secured whenever possible. If this is not possible, other occupations within the same company are to be identified that would be adequate given the health issues. Beyond that, there is a huge catalogue of labor market programmes aiming at securing labor market participation and helping to adjust to occupational changes and reorientations. For example, there are occupational integration assistance measures that include assistance to help keeping or obtaining a job, including advice, placement and mobility assistance, pre-training measures, refresher courses, vocational retraining and further training. In order to assist the employer in terms of income support, wage subsidies are paid. Usually up to 50% of the last net income is paid; for older employers, and/or with a severe disability, wage subsidies can be up to 70%. In cases of physical or sensory disabilities, workplace equipments are financed. This can be headphones or Braille keyboards. In order to ensure accessibility to the workplace, workplace equipment for the employer, e.g. ramps for wheel chair users are paid for.

During measures of longer duration (e.g. retraining or further training measures), employment cannot be sustained in parallel with the participation in qualification measures. In these cases, income support is provided according to entitlements to payments of unemployment insurance. If people have paid contributions to the unemployment insurance for at least 12 months in the last two years, they are eligible for unemployment benefits. The receipt of benefits is, however, limited to usually one year and covers 60% of

the (lump-sum) net income (67% when living with a child). If eligibility for unemployment benefits is not given, basic income support is paid in times of unemployment or participation in labor market programmes. However, even the receipt of basic income support is linked to the household principle in Germany, i.e. if a relative or partner shares the same household and is able to financially support the client, no basic income support is paid. However, it is possible to apply for other types of financial support whilst in vocational rehabilitation.

7.3 Return to Work After Vocational Rehabilitation

The following chapter will summarize the study by Gruber et al. (2016) on return to work after vocational rehabilitation financed by the FEA. Based on a panel survey of the Institute for Employment Research, the study starts at the end of the main measure during vocational rehabilitation and follows promoted rehabilitants up to their labor market reintegration. The main labor market measure is the main strategy or intervention during vocational rehabilitation in case of several measures applied. The main measure is identified by a hierarchy, where qualification measures are, e.g. in a hierarchically higher position compared to integrative measures (vocational retraining combined with employment subsidies). The following questions are to be answered:

- How many rehabilitants participate in the labor market after vocational rehabilitation?
- How long does it take from the end of the labor market programme to labor market integration?
- How sustainable is the first employment period?
- Which determinants for a successful and sustainable employment integration can be identified?

There are empirical research investigations on vocational rehabilitation in Germany. Especially involving the target population of the FEA. Nevertheless, analyses on return to work after vocational rehabilitation are worthwhile in order to assess the effect of vocational rehabilitation on labor market integration. It is of central interest for institutions financing vocational rehabilitation, as well as policy makers, to understand whether societal participation is improved and investments are successful.

There are several studies that focus on return to work after vocational rehabilitation in the context of different institutions. Slesina et al. (2010) conducted a study on return to work after specific qualification measures in different types of educational training centres for vocational rehabilitants and found that a successful take up of employment depends on social support from family and friends, the educational background, subjective health factors and the regional labor market context. The importance of the regional labor market structure for return to work is also mentioned by Hetzel (2015), who found that the probability of return to work is associated with a low regional unemployment rate.

The present study is based on data and population covered by Wuppinger and Rauch (2010). Besides the analyses of different access probabilities for different main measures in vocational rehabilitation, the study focuses on the labor market entry six months after the completion of three main measures in vocational rehabilitation: orientation and training, qualification and integration (e.g. subsidized employment). Group differences are identified in this context based on multivariate regression analyses. Yet again, the regional labor market and the educational as well as the individual labor market biographies are central factors for return to work. Positive associations can be deducted from: the onset of disability being between the age of 17 and 25, urban regions, those in possession of a driver's licence and for prolonged job experiences.

The following analyses start at the end of the main labor market measure during vocational rehabilitation, focussing on the entry into the labor market, as well as on the sustainability of employment—an aspect that has not yet been systematically investigated in previous studies. In addition, the time factor in job search is added to the analyses by applying event history analyses.

7.4 Method

To observe differences in job search and in keeping employment, event history analyses are used (Blossfeld et al., 2007). The method accounts for the fact that the individual employment biographies can only be observed for a restricted time frame after the completion of the measure (right-censoring). Specifically, piecewise-constant models are used, where the observational time frame is separated into several time periods.

Within the analyses, two parts are distinguished. The first part observes the period after the completion of the main rehabilitation measure. The time until the event "entry into employment liable to social security contributions or self-employment" takes place, is analysed. A Kaplan-Meier estimation displays the job search period and the average share of rehabilitants taking up employment. Multivariate analyses estimate the rate of employment transition in association with individual characteristics, the type of labor market programme and structural circumstances. The second part of the analyses is limited to those obtaining employment after vocational rehabilitation. It observes the average duration in reemployment by using a Kaplan-Meier estimation. Afterwards, it observes group differences in sustainability of employment based on multivariate event history analyses. The event observed in this context is the "exit from employment".

Data

To investigate return to work after vocational rehabilitation, a three-wave panel survey on vocational rehabilitation is used. The first survey wave was conducted in 2007 and the survey was continued with two additional waves in 2008 and 2010. From register data of the FEA, a sample is drawn of registered vocational rehabilitants, who completed a labor market programme of the FEA within the year of 2006. The sample is disproportionally

stratified according to the type of main programme attended during vocational rehabilitation. Therefore, participants of specific labor market measures are included with a higher probability than others (e.g. rehabilitation-specific qualification programmes compared to general qualification programmes). On a second level, the sample is proportionally stratified according to sex, age, type of disability, the quarterly period the main labor market programme was completed and place of birth (sample weights are used for an adjusted description of the population). The aim of the survey was to question rehabilitants concerning their individual process of vocational rehabilitation, about their experiences in measures, and to know more about their employment biographies before and after vocational rehabilitation.

Population

The analysis population (Table 7.1) comprises 1.417 individuals (weighted 1.465 in individuals) and a time frame of up to 69 months after the completion of the main measure. 70% of the population is male and average age is 37 years at the end of the main measure. Average years of employment are 11 years. Almost half of the population has a lower secondary schooling degree. About one third has a medium secondary schooling degree, whereas 6% have a high secondary schooling degree. 11% of the population has no schooling degree.

In terms of disability, the main groups are people with a physical (36%), psychological (11%) and disability of the internal organs (8%), while 12% of the population refers to people who negate having a disability also observed in other studies (Hofmann-Lun, 2011; Johansson & Skedinger, 2005; Reims & Gruber, 2014). Coping strategies are often behind that claim in order to avoid being labelled or discriminated (Eberwein, 1996; Wocken, 1983).

Concerning the subjective health condition, people were asked to state their general health in five levels. Over half of the population state a (very) good health condition; one fourth considers their subjective general health (very) poor. Two third of the rehabilitants experience the onset of their disability or health issue after the age of 15—thus, during their employment biography. About one third participated in vocational training, retraining or further training measures; thus, reorientation in terms of changing occupation to meet the demands of the labor market. Approximately one fourth participates in shorter training measures and 18% in job creation measures and integrative measures respectively. The aim of these measures is a successful labor market reintegration.

7.5 Results

The majority of the rehabilitants are successful in finding employment after the completion of the main measure. Figure 7.1 shows the share of people (Y-axis) experiencing an employment transition (displayed as vertical lines in the diagram) and the time elapsed until this event takes place (X-axis). The transition rates into employment

Table 7.1 Population details. (*Source* IAB-Panel Survey, own calculations, Gruber et al., 2016, translated)

Covariates; N = 1465; weighted		Number of Cases	Percent
Gender	Male	993	67.8
	Female	472	32.2
Age	Mean years = 36.9	SD = 10.51	Min = 17 Max = 63
Schooling Degree	special school	67	4.6
	lower secondary schooling	671	45.8
	medium secondary schooling	448	30.6
	higher schooling	94	6.5
	no schooling degree	160	10.9
	other/don't know	24	1.6
Location of Birth	western Germany	764	52.1
	eastern Germany	541	36.9
	outside of Germany/don't know	160	11.0
Citizenship	German	1378	94.1
	other	87	5.9
Household context	living alone	462	31.5
	with relatives/other persons	349	23.7
	with partner/and child	656	44.8
Driver's Licence	yes	1120	76.4
	no	345	23.6
Cum. Employment Experience (before main measure)	Mean (in months) = 129.0	SD = 123.31	Min = 0; Max = 520
Disability (main)	physical	522	35.6
	visual/hearing	110	7.5
	epilepsy	45	3.1
	internal organs	124	8.5
	psychological/mental	171	11.7
	learning	62	4.2
	allergy	88	6.0
	other disability	140	9.6
	no disability	170	11.6
	refused/don't know	33	2.3

(continued)

Table 7.1 (continued)

Covariates; N = 1465; weighted		Number of Cases	Percent
Onset of Disability	since birth	158	10.8
	younger than 10y	105	7.2
	between 10 and 24y	389	26.6
	between 25 and 34y	290	19.8
	between 35 and 44y	231	15.7
	45y and older	120	8.2
	Missing	172	11.8
Subjective Health	(very) good	713	48.7
	medium	382	26.0
	(very) poor	371	25.3
Main Measure	sheltered workshop	29	2.0
	vocational training (dual or school)	142	9.7
	retraining, further training	309	21.1
	vocational preparation	96	6.5
	training measure	377	25,8
	job creation measure	260	17.8
	integration measure	252	17.2

are distinguished by sex. During the first month after vocational rehabilitation a large share of the population takes up employment: 38% of the male rehabilitants vs. 34% of the female rehabilitants. To obtain an average view of the population, the median is observed. 50% of men obtain employment after five months, whereas women obtain employment after eight months. The median for the total population is six months. Over the whole observation period (nearly six years), however, about two thirds (N = 910) of total population takes up employment.

Multivariate analyses were conducted to identify factors that are relevant in terms of successful labor market entry (Table 7.2). Relevant control variables are described in the research state.

1. Job search duration: As already observed descriptively, multivariate results confirm that the probability for the take up of employment after vocational rehabilitation is highest in the first five months after the end of the labor market measure.
2. Sociodemographic information: Male rehabilitants have a slightly higher chance of gaining employment compared to female rehabilitants. Similar positive effects on

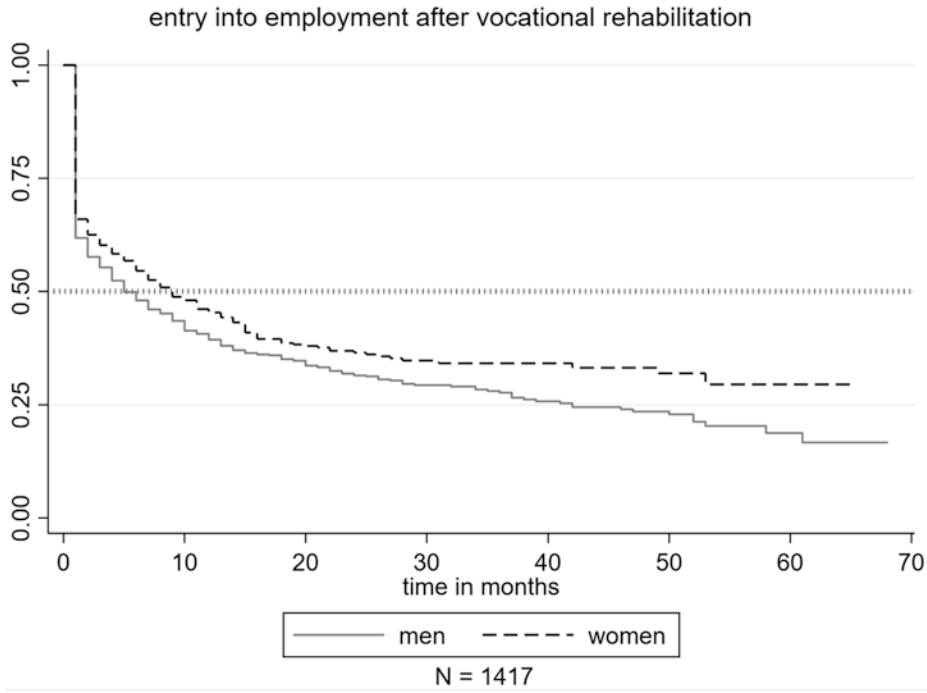

Fig. 7.1 Job Search. (*Source* IAB-Panel Survey, own calculations, Gruber et al., 2016, translated)

employment transitions can be seen for young rehabilitation graduates, those living with a partner and those with a medium secondary schooling degree compared to those without any degree. Having a driver's licence improves the chances for employment, including the area of residency—irrespective of urban or rural regions.

3. Employment biography: The duration of unemployment prior to vocational rehabilitation plays a minor but negative role in terms of labor market reintegration. Social contacts with former employers in the context of job search are positively associated with successful labor market integration.
4. Specifics of the rehabilitation process: There are group differences in the reintegration rates between individuals who received different types of main measures during vocational rehabilitation. Integrative measures show the highest rates of reintegration comparatively. This is due to the fact that connections to employers with disability adequate employment have already been established during vocational rehabilitation. If qualification measures are chosen as the main rehabilitation strategy, a successful completion of the programme—at best associated with the acquisition of a certificate—provides better integration chances.
5. Health specifics: Surprisingly, labor market integration is independent of the type of disability. This is due to the inclusion of subjective health characteristics within the multivariate model. Rehabilitants who state a negative subjective health condition

Table 7.2 Multivariate Analyses. (*Source* IAB-Reha-Panel Survey, own calculations)

Covariates	Job search: Entry into employment	Sustainability of employment: Exit from employment
Ref.: Female		
Male	+	n.s.
Age (centered)	–	n.i.
Ref.: No schooling degree		
medium secondary schooling	+	n.s.
Ref.: Living with partner and/or child		
living with parents/relatives	–	+
living alone	n.s.	+
Ref.: Not searching for a job (help with job search)		
help by rehabilitation institution	–	n.i.
help by former employer	+	
help by others	–	
Ref.: No driver's licence		
driver's licence	+	n.s.
cum. months in unemployment (before rehabilitation)	–	–
Ref.: Qualification measure (main measure)		
integrative measure	+	n.s.
Ref.: Qualification measure without certificate/not successful		
Qualification measure successful with certificate	+	n.s.
Ref.: No disability		
disability of the internal organs	n.s.	+
psychological disability	n.s.	+
Ref.: (very) good subjective general health condition		
medium	n.s.	+
(very) poor	–	+
Ref.: Urban; good labor market conditions		
rural region; favorable labor market; high seasonal dynamics	+	n.s.
low density region; east; bordering west Germany; high unemployment	–	n.s.
low/medium density; eastern Germany; unfavorable labor market	–	n.s.
rural region; eastern Germany, unfavourable labor market	–	n.s.
number of persons	1222	802
number of events	785	324

n.s. = not significant; n.i. = not included; further controls: time intervals, citizenship, onset of disability, end of main measure, general motivation

have significantly lower chances of obtaining employment compared to those with a (very) good health status. Several studies have shown that subjective health is a reliable predictor in terms of mortality and incapacity for work (Bjørner et al., 1996; Idler & Kasl, 1991; Singh-Manoux et al., 2006).

To characterize sustainability of employment, 910 individuals obtaining employment after vocational rehabilitation are analysed (67% of the whole population). A Kaplan-Meier-Estimation is applied to display the employment period (Fig. 7.2). It starts at the beginning of employment and calculates the duration until a person is no longer employed. The event is defined as "exit from employment", whilst job-to-job transitions are not considered an employment exit. In total, 501 out of 910 rehabilitants stay employed until the end of the observation period. Figure 7.2 shows that there is no difference in terms of sex. For both, men and women, employment lasts on average (median) for almost three years (34 months). Rehabilitants exit employment mostly due to sickness (13%), further labor market measures (13%), and unemployment (63%).

To identify relevant factors for the sustainability of employment after vocational rehabilitation, a multivariate analysis was conducted (no table shown). Shorter phases of employment are particularly associated with health determinants and household context:

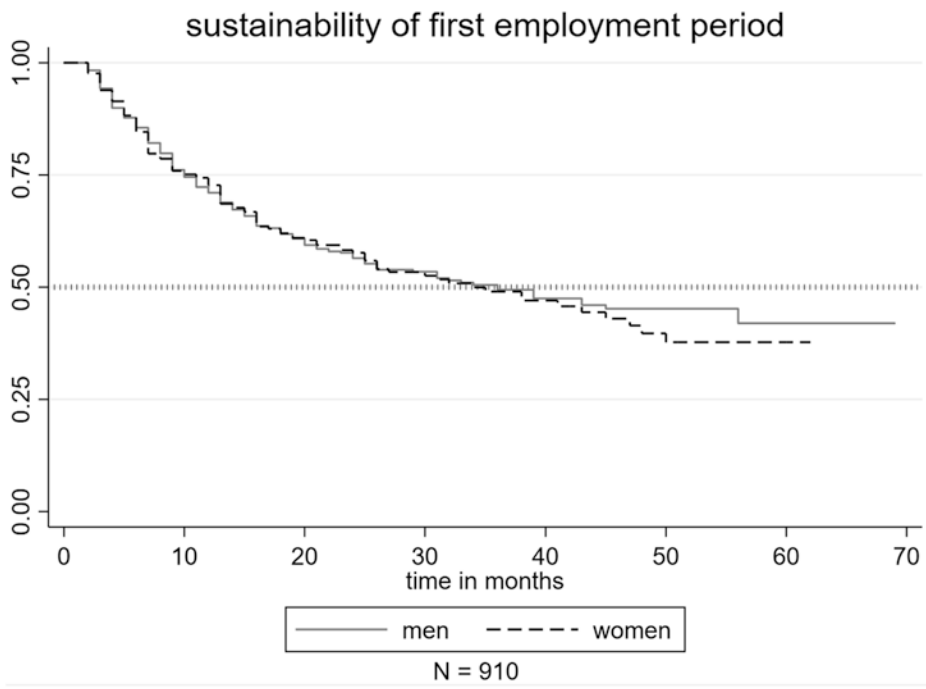

Fig. 7.2 Sustainability of Employment. (*Source* IAB-Panel Survey; own calculations, Gruber et al., 2016, translated)

People who rate their general health as (very) poor have the least chances of sustaining employment and people with a disability of the internal organs and a psychological disability show the shortest employment periods, as well as people living alone or with relatives.

7.6 Discussion

Disabled and sick-listed people are facing barriers in terms of education and employment. Vocational rehabilitation is a key intervention provided by the welfare state to promote and ensure social participation and to counteract exclusion mechanisms from the labor market. The present study constitutes an important addition to prior research on vocational rehabilitation. The results of this study on return to work after vocational rehabilitation show that the majority of individuals are likely to sustain employment after the intervention. This is confirmed by similar assessments made in the German social participation report: the system of promotional measures for disabled and sick-listed people facilitates the entry into the labor market (BMAS, 2013) and aids restoring work ability and social participation as emphasized in Social Code IX.

However, there is still a lack of knowledge related to the legal possibilities in restoring occupational limitations (Riedel et al., 2009) as referral rates to vocational rehabilitation could be time consuming. Financial and personnel resources could also delay the entry to vocational rehabilitation. The advantage of vocational rehabilitation as shown in this study is the person centered measures, while the fragmented system, with its different and complex responsibilities, can as well be seen as a disadvantage. This is the case when bureaucracy becomes a barrier and coordination between different institutions is unsatisfactory to the disadvantage of the rehabilitant (Nürnberger, 2013; Rauch & Dornette, 2010).

Future research will benefit from investigating factors associated with those individuals who are not finding employment in the following years after vocational rehabilitation. Moreover, the direct effect of specific (qualifying) labor market programmes must be recognised in order to precisely identify the best-suited measure. A major challenge for future research is the heterogeneity of the population of vocational rehabilitants in terms of health-related and occupation-specific issues.

7.7 Conclusion

A large proportion of vocational rehabilitants find sustainable employment. In terms of job search, women take longer than men. Other factors for fast and successful labor market integration are age, qualification levels, job networks, mobility, type of labor market measure, regional labor market at place of residence and the general health condition. Sustainability of employment is in particular associated with general health and household context.

References

Bjørner, J. B., Kristensen, T., Orth-Gomér, K., Tibblin, G., Sullivan, M., & Westerholm, P. (1996). *Self-rated health, a useful concept in research, prevention and clinical medicine.* Swedish Council for Planning and Coordination of Research.

Blossfeld, H.-P., Rohwer, G., & Golsch, K. (2007). *Event history analysis with Stata.* Lawrence Erlbaum Associates.

BMAS. (2013). *Teilhabebericht der Bundesregierung über die Lebenslagen von Menschen mit Beeinträchtigungen* (p. 474). BMAS.

Bundesarbeitsgemeinschaft für Rehabilitation (BAR). (2014). *Geschäftsbericht 2014*. Frankfurt/Main.

Dony, E., Gruber, S., Jasim, A., Rauch, A., Schmelzer, P., & Schneider, A., et al. (2012). Basisstudie zur Evaluation von Leistungen zur Teilhabe behinderter Menschen am Arbeitsleben. In: BMAS (Ed.), *Berufliche Rehabilitation. Evaluation von Leistungen zur Teilhabe behinderter Menschen am Arbeitsleben. Zwischenbericht. Teil A*.

Eberwein, F. (1996). Sozialpsychologische Untersuchungen zur Stigmatisierung und Diskriminierung sowie zum Selbstkonzept sogenannter Lernbehinderter. In: H. Eberwein (Ed.), *Handbuch Lernen und Lern-Behinderungen – Aneignungsprobleme Neues Verständnis von Lernen Integrationspädagogische Lösungsansätze* (pp. 192–211). Weinheim und Basel: Beltz Verlag.

Ekert, S., Frank, W., Gericke, T., Matthes, S., & Sommer, J. (2012). *Implementationsstudie 1 zur Evaluation von Leistungen zur Teilhabe behinderter Menschen am Arbeitsleben. Zusammenfassender Bericht (Teil B)*. Evaluation von Leistungen zur Teilhabe behinderter Menschen am Arbeitsleben No 427. Forschungsbericht Berufliche Rehabilitation Berlin.

Federal Ministry of Labor and Social Affairs. (2014). Social security at a glance. http://www.bmas.de/SharedDocs/Downloads/DE/PDF-Publikationen/a998-social-security-at-a-glance-total-summary.pdf?__blob=publicationFile. Accessed 10 Feb 2020.

Fuchs, J., & Söhnlein, D. (2013). *Projektion der Erwerbsbevölkerung bis zum Jahr 2060*. IAB-Forschungsbericht. IAB.

Gruber, S., Rauch, A., & Reims, N. (2016). Wiedereingliederung von Rehabilitanden der Bundesagentur für Arbeit – Zeitpunkt, Nachhaltigkeit und Einflussfaktoren für den Wiedereinstieg. In: A. Zoyke & K. Vollmer (Eds.), *Inklusion in der Berufsbildung: Befunde – Konzepte – Diskussion. Berichte zur beruflichen Bildung AG BFN* (pp. 143–160). Bielefeld: Bertelsmann.

Hetzel, C. (2015). Mehrebenenanalysen zu Arbeitsmarkt und Wiedereingliederung nach beruflichen Bildungsleistungen. *Die Rehabilitation, 54*(1), 16–21.

Hofmann-Lun, I. (2011). *Förderschüler/innen im Übergang von der Schule ins Arbeitsleben. Beruflich-soziale Integration durch gesonderte Förderung?* Forschungsschwerpunkt Übergänge im Jugendalter.

Idler, E. L., & Kasl, S. (1991). Health perceptions and survival: Do global evaluations of health status really predict mortality? *Journal of Gerontology, 46*(2), 55–65.

Jahoda, M. (1982). *Employment and unemployment: a social-psychological analysis.* Cambridge University Press.

Johansson, P., & Skedinger, P. (2005). *Are objective, official measures of disability reliable?* No. 643: The Research Institute of Industrial Economics.

Marten, U. (2015). Über 10 Millionen behinderte Menschen im Jahr 2013. In: Statistisches Bundesamt (Ed.), *Pressemitteilung*. Wiesbaden: Statistisches Bundesamt.

Nürnberger, I. (2013). Das Rehabilitationssystem in Deutschland: was gut läuft, wo es hakt und was sich ändern muss. *Soziale Sicherheit, 4,* 125–131.

Pfaff, H. (2012). Lebenslagen der behinderten Menschen – Ergebnisse des Mikrozensus 2009. In: Statistisches Bundesamt (Ed.), *Wirtschaft und Statistik*. Wiesbaden: Statistisches Bundesamt.

Rauch, A., & Dornette, J. (2010). Equal rights and equal duties? Activating labor market policy and the participation of long-term unemployed people with disabilities after the reform of the German welfare state. *Journal of Social Policy, 39*(1), 53.

Reims, N., & Gruber, S. (2014). Junge Rehabilitanden in der Ausbildung am Übergang in den Arbeitsmarkt. *Die Rehabilitation, 53*(6), 376–383.

Riedel, H.-P., Schmidt, C., Ellger-Rüttgard, S., Karbe, H., Niehaus, M., Rauch, A., et al. (2009). Die Zukunft der beruflichen Rehabilitation Erwachsener gestalten: acht Handlungsfelder als Ausgangspunkt für einen akteursübergreifenden Innovationsprozess. *Die Rehabilitation, 48*(6), 375–382.

Singh-Manoux, A., Martikainen, P., Ferrie, J., Zins, M., Marmot, M., & Goldberg, M. (2006). What does self rated health measure? Results from the British Whitehall II and French Gazel cohort studies. *Journal of Epidemiology and Community Health, 60*(4), 364–372.

Slesina, W., Rennert, D., & Patzelt, C. (2010). Prognosemodelle zur beruflichen Wiedereingliederung von Rehabilitanden nach beruflichen Bildungsmaßnahmen. *Die Rehabilitation, 49*(4), 237–247.

Wocken, H. (1983). *Am Rande der Normalität. Untersuchungen zum Selbst- und Gesellschaftsbild von Sonderschülern.* Schindele.

Wuppinger, J., & Rauch, A. (2010). *Wiedereingliederung in den Arbeitsmarkt im Rahmen beruflicher Rehabilitation: Maßnahmeteilnahme, Beschäftigungschancen und Arbeitslosigkeitsrisiko*. http://doku.iab.de/forschungsbericht/2010/fb0110.pdf. Acessed 10 Feb 2020.

Effects of Graded Return-to-Work: A Propensity-Score-Matched Analysis

8

Matthias Bethge

Abstract

Graded work exposure is deemed to have a therapeutic effect. In Germany, graded return-to-work (GRTW) is therefore frequently used following a rehabilitation program if workers are still unable to perform full job duties. The aim of the analyses was to determine long-term effects on disability pension and regular employment. Analyses were performed with longitudinal administrative data. Patients aged between 18 and 60 years who attended orthopedic, cardiac, oncological, or psychosomatic rehabilitation between January and June 2007 and were eligible to participate in a GRTW scheme. The effects of GRTW were analysed by a propensity-score-matched comparison of patients with and without GRTW. The probability of a disability pension was decreased by about 40 percent among GRTW patients (5.4% vs. 8.6%). The three-year income (2007–2009) was €12.920 higher in the GRTW group. The duration of receiving welfare benefits due to sickness absence and unemployment was significantly reduced. Graded work exposure supports labor participation and reduces the risk of permanent work disability.

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8.1 Introduction

Work disability has rising direct and indirect costs to societies (OECD, 2010). In Germany, current levels of sickness absence are estimated to equate up to 568 million days lost per annum. This corresponds to an annual loss of production of around €59 billion. The loss in productivity due to sickness absence is estimated to be €103 billion annually (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, 2014). To meet the challenge of work disability, prevention and management of work disability have become a priority in many national health and welfare strategies (Aust et al., 2012; Higgins et al., 2012; Ilmarinen, 2006, 2009; Poulsen et al., 2014; Seing et al., 2015). These strategies are diverse. In many countries, rehabilitation services are provided to support work-disabled patients to return to work and to achieve sustainable work participation for patients who experience limitations in work functioning. Though clinical interventions such as functional restoration or work hardening (Bethge et al., 2011; Gatchel & Mayer, 2008; Hoefsmit et al., 2012; Loisel et al., 1997; Norlund et al., 2009; Schaafsma et al., 2013; Streibelt & Bethge, 2014) might be a major component of a rehabilitation strategy, several authors have also stressed the importance of involving workplace stakeholders in managing the return-to-work process (Loisel et al., 2005; van Vilsteren et al., 2015). Involving workplace stakeholders gives rehabilitation and occupational health professionals the opportunity to gauge if rehabilitation can be facilitated by getting the worker back to work despite that she or he is still unable to perform full job duties. If the individual has returned to work, working hours and tasks can be increased gradually until the worker is again able to cope with regular and full demands (Krause et al. 1998b). This strategy is called therapeutic work resumption, graded work exposure, or graded return-to-work (GRTW).

In Germany, GRTW is possible if patients have finished their rehabilitation program but are still unable to perform full duties. GRTW is defined as a therapeutic measure that aims to test and to practice work capacity at the workplace. It is usually initiated by the rehabilitation physician and the social worker in the rehabilitation centre and needs consent from the patient, the employer, the general practitioner and the occupational physician. The patient begins to work for at least two hours/day. The rehabilitation physician develops a scheme, which gradually increases the working time. The scheme ends with full return-to-work. In case of a GRTW, employees continue to receive sickness benefits from the Pension Insurance Agency. There are no direct costs for wages for the employer. GRTW must be started within four weeks after completion of the rehabilitation program (Bethge, 2016, 2017; Streibelt et al., 2018).

Graded work exposure is deemed to have a therapeutic effect among work-disabled persons as prolonged absence from work negatively affects physical conditioning and mental health and increases the risk of receiving a disability pension (Durand & Loisel, 2001; Lund et al., 2008; Seing et al., 2015; van Vilsteren et al., 2015; Yassi et al., 1995). Returning to work with reduced demands allows the worker to re-experience self-efficacy and co-worker support and to challenge avoidance beliefs. Anema and colleagues

reported that therapeutic work resumption was a significant predictor for sustainable return-to-work in a six-nation cohort study of back-pain patients on long-term sick leave (Anema et al., 2009). Moreover, a systematic review by Krause and colleagues at the end of the 1990s summarized that graded work exposure increased work participation and reduced the number of lost working days (Krause et al., 1998a). This conclusion was, however, mostly based on observational studies. Moreover, in the included studies, graded work exposure was usually only one element of a broader intervention. Specific effects of graded work exposure were difficult to separate.

In Germany, retrospective analyses demonstrated positive effects of GRTW on labor participation up to one year. One year after the rehabilitation program, 91% of GRTW participants were working, but only 78% without therapeutic work resumption (Bürger et al., 2011). However, covariates for matching were assessed retrospectively and were prone to recall bias. Moreover, follow-up was restricted to one year. Analyses of long-term follow-up effects on disability pension and regular employment are still lacking. Therefore, the aim of this study was to explore the long-term effects of GRTW following a rehabilitation program for patients who were still work-disabled at the end of the rehabilitation program.

8.2 Method

Design

Administrative data were provided by the German Pension Insurance Agency. The data comprised income trajectories, disability pensions and welfare benefits due to sickness absence and unemployment for a random sample of all rehabilitation patients who completed a rehabilitation program between 2002 and 2009. We included persons aged 18–60 years who had finished an orthopedic, cardiac, oncological, or psychosomatic rehabilitation program in the first half of 2007. Persons had to be eligible for GRTW, i.e., they had a regular job contract and their rehabilitation physician had given a positive return-to-work prognosis although they were still unable to perform full job duties at the end of the rehabilitation program. Persons were excluded if they started to receive a disability pension before the end of 2007 or died during the follow-up period.

Primary and Secondary Outcomes

Primary endpoint was the receipt of a disability pension. Disability pensions can be approved as full or partial pensions. About 90% are full pensions. Disability pensions are usually permitted temporarily (≤ 3 years). Continuation of the pension requires further verification. Once approved, a later refusal is rare. Temporary pensions become permanent after nine years. Survival time was computed from 1 January 2008. Cases were censored until the date of starting to receive pension benefits. Non-cases were censored until 31 December 2009. Secondary outcomes were the income from regular employment from 2007 to 2009 as well as duration of receiving welfare benefits due to sickness

absence and unemployment during the follow-up period (short-term unemployment, long-term unemployment or sickness absence benefits).

Explanatory Variables

Sixteen variables were considered as potential confounders. Three assessed socio-demographic characteristics (age, sex, place of residence). Two variables represented the income from regular employment in 2005 and 2006, respectively. Six variables described the time of receiving welfare benefits due to sickness absence and unemployment in 2005 and 2006 (short-term unemployment benefits, long-term unemployment benefits, sickness absence benefits). Five variables were related to characteristics of the completed rehabilitation program: rehabilitation following a prompt by the health insurance agency, cumulative duration of sickness absence prior to the rehabilitation program (<3 months vs. ≥ 3 months), type of rehabilitation program (post-acute rehabilitation vs. rehabilitation due to chronic conditions), rehabilitation diagnosis (musculoskeletal disorders, cardiovascular disorders, psychosomatic disorders or cancer), and duration of the completed rehabilitation program.

Statistical Analysis

Propensity score matching was used for defining a comparison group, as comparable as possible to the group of persons with GRTW, and issued from the large group of subjects without GRTW (Dehejia & Wahba, 2002; Descatha et al., 2013; Guo & Fraser 2010; Rosenbaum & Rubin 1983; Saltychev et al. 2012a, 2013; Schelvis et al., 2015). The propensity score is the conditional probability of receiving the treatment (i.e. GRTW) given the vector of observed background variables. Matching by propensity scores enables balanced characteristics of the treated and the untreated sample if there is sufficient overlap of the propensity scores of both groups. Compared with a conventional direct matching procedure, the problem of multidimensionality in finding a corresponding control (for instance related to age, sex, sick leave duration, former income and others) is thereby reduced to one dimension only.

The propensity score was estimated by a logistic regression model including the 16 potential confounders as described above. For every person who gradually returned to work, the person without GRTW with the most similar propensity score was selected from the larger pool of potential controls. Resampling was realized without replacement. Sensitivity analyses were performed using a caliper of one quarter and one tenth of the standard deviation of the propensity score during resampling to increase the similarity of cases and controls by excluding the cases for whom it was especially difficult to find an adequate control. Additional sensitivity analysis tested if the effects on disability pension varied over the range of the propensity score. For this purpose, the propensity score was categorised based on quartiles, and the effects of GRTW were compared over the quartile-based groups.

Balance of cases and controls before and after matching were checked by bivariate statistics (t test, chi-square test). As an indicator of the bias before and after matching

due to differences related to the observed sample characteristics, the standardised percentage bias was calculated. This is the difference of the sample means in cases and controls relative to the square root of the average of the sample variances in both groups (Rosenbaum & Rubin, 1985).

Analyses of treatment effects in propensity-score-matched samples can use the same statistical methods that are also used in experimental studies (Guo and Fraser, 2010; Rosenbaum & Rubin, 1983). Differences in the survival distribution in working life for both groups were analysed with proportional hazards models. The hazard rate ratio (HR) and the corresponding 95% confidence interval (CI) were determined to estimate the relative risk reduction. Moreover, the absolute risk reduction and the number needed to treat (NNT) to avoid one additional disability pensioner were calculated. In addition, interaction terms were included in the proportional hazard model to examine if baseline characteristics, e.g. rehabilitation following a prompt by the health insurance agency, moderated the treatment effect. Interactions were first tested for age, sex and diagnostic groups. Age was categorized for this purpose (18–50 vs. 51–60 years). Additionally, interactions were tested for indicators of severity of work disability (prompt for rehabilitation by health insurance agency and sickness absence duration) as stronger effects were assumed for more severely restricted persons. The comparative analyses of the effects on average income from regular employment and average time of receiving welfare benefits due to sickness absence and unemployment were conducted with t tests. Additionally, Mann-Whitney U tests were used as a nonparametric alternative.

Statistical differences were regarded as significant if the two-sided P-value of a test was <0.05. All analyses were performed with STATA statistical software, version 12 (StataCorp LP, TX, USA). Propensity score matching was realized by using the procedure psmatch2.

8.3 Results

The primary sample included 11.581 persons, of whom 1.875 (16.2%) gradually returned to work after the end of their rehabilitation program. Characteristics of persons with and without GRTW are shown in Table 8.1. There were considerable covariate imbalances. Persons with GRTW were, for instance, younger and more frequently female compared with work-disabled persons who did not gradually return to work. Moreover, persons with GRTW were more severely restricted in working life as they were more frequently prompted by their health insurance agency to request a rehabilitation program, e.g., due to long-term sick leave or severe chronicity, and they were more likely to have ≥ 3 months of cumulative sick leave within the 12 months before starting the rehabilitation program. The median of the propensity scores of both groups clearly differed (GRTW vs. non-GRTW: 0.28 vs. 0.08). However, there was substantial overlap between the distributions of propensity scores in the two groups so that for every case one similar control was identified. Baseline differences between cases and controls

Table 8.1 Characteristics of Patients with and without GRTW (GRTW = graded return-to-work; SD = standard deviation; UEB = unemployment benefits)

	With GRTW (N = 1875)	Without GRTW (N = 9706)	Controls (N = 1875)
	Mean (SD) or %	Mean (SD) or %	Mean (SD) or %
Age (years)	44.8 (8.0)	47.0 (8.0)	44.6 (8.4)
Sex: female	50.3	43.2	49.3
Region: East Germany	13.1	18.4	12.6
Prompt by health insurance agency	17.4	8.5	17.9
Duration of sickness absence ≥ 3 months	64.8	40.5	66.0
Post-acute rehabilitation	19.1	59.0	19.6
Diagnoses			
Musculoskeletal disorders	63.8	63.7	64.6
Cardiovascular disorders	9.3	16.8	9.1
Mental and behavioral disorders	21.2	7.8	20.7
Cancer	5.7	11.7	5.6
Duration of rehabilitation program (days)	29.4 (9.2)	25.8 (7.0)	29.5 (9.7)
Income 2005 (euros)	30.048 (12.332)	26.924 (14.480)	29.955 (13.765)
Income 2006 (euros)	28.069 (12.844)	25.817 (14.693)	27.948 (14.317)
Sickness absence benefits 2005 (days)	7.9 (31.3)	10.2 (39.0)	8.8 (30.9)
Sickness absence benefits 2006 (days)	41.7 (71.7)	35.2 (70.1)	43.9 (72.8)
Short-term UEB 2005 (days)	4.5 (30.2)	10.0 (43.7)	4.5 (26.2)
Short-term UEB 2006 (days)	2.1 (17.2)	6.3 (33.0)	2.3 (17.3)
Long-term UEB 2005 (days)	4.1 (32.7)	13.4 (61.9)	4.1 (31.6)
Long-term UEB 2006 (days)	3.6 (30.8)	12.8 (61.6)	3.8 (31.8)

were reduced to a minimum (mean bias before and after matching: 25.1% vs. 1.4%). The one-to-one matched analytic sample included 3.750 persons (with GRTW: N = 1.875; matched controls: N = 1.875). Characteristics of the matched controls are presented in the third column of Table 8.1. Persons with GRTW and matched controls were balanced regarding all baseline scores, i.e., there were no significant differences in any of the observed baseline variables.

Disability Pension

The risk of a disability pension decreased from 8.6% among patients without GRTW to 5.4% among patients with GRTW. This corresponds to a relative risk reduction of about 40% (HR = 0.62; 95% CI 0.49–0.80; Fig. 8.1). The absolute risk reduction was 3.2%. The NNT was 31 persons, i.e., 31 persons had to start a GRTW to avoid one additional disability pensioner.

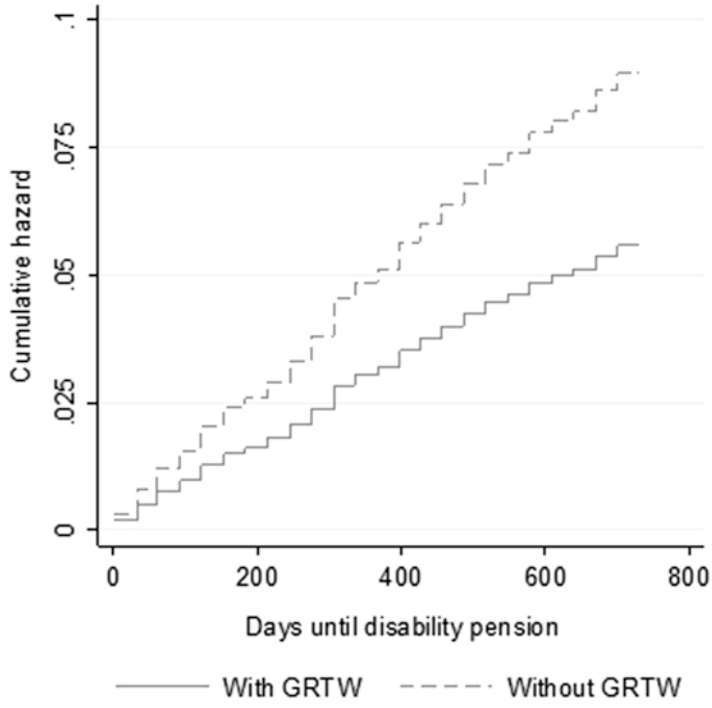

Fig. 8.1 Cumulative Probability of a Disability Pension in Patients with and without Graded Return-to-work (GRTW = graded return-to-work)

There were no significant interactions with age, sex and diagnostic group. However, findings indicated that there was no effect on a diminished disability pension risk among patients with cardiovascular diseases. The effect of GRTW on a decreased risk of a disability pension was approximately 2-times stronger among patients who started their rehabilitation program following a prompt by their health insurance agency compared to patients who were not (prompted by health insurance agency: HR = 0.34, 95% CI 0.18-0.62; not prompted by health insurance agency: HR = 0.72, 95% CI 0.55-0.95; interaction: P = 0.027). The NNT were 13 and 47, respectively. A similar finding was seen when comparing persons with sickness absence duration prior to the rehabilitation program < 3 months (HR = 0.81, 95% CI 0.51–1.30) versus ≥ 3 months (HR = 0.57, 95% CI 0.42–0.76). However, the interaction term was not significant in this case (P = 0.207).

Income From Regular Employment

Both groups had comparable earnings in 2005 and 2006 prior to the start of their rehabilitation program. During follow-up, i.e., from 2007 until 2009, the average annual income level in persons with GRTW was €3.700 to €4.700 higher than among those without GRTW (Table 8.2). In total, the accumulated income from regular employment from 2007 to 2009 was €12.920 (95% CI €10.054 to €15.786) higher among GRTW patients.

Sickness Absence and Unemployment Benefits

Patients with GRTW received less welfare benefits due to sickness absence and unemployment up to the end of 2009 than patients without GRTW (Table 8.2). The accumulated time of receiving sickness absence benefits was reduced by 52 days (95% CI 40 to 64 days), short-term unemployment benefits by 58 days (95% CI 49 to 67 days), and long-term unemployment benefits by 15 days (95% CI 10 to 20 days).

Sensitivity Analyses

Sensitivity analyses that used calipers of 0.1 and 0.25 of the standard deviation of the propensity score for matching resulted in samples of 3.738 and 3.734 persons. Findings on the effects on disability pension were identical (HR = 0.62, 95% CI 0.49-0.80). The comparative analyses of annual income yielded differences of €13.004 (95% CI €10.135

Table 8.2 Income and Time of Receiving Welfare Benefits due to Sickness Absence and Unemployment from 2007 to 2009 in Patients with and without GRTW (GRTW = graded return-to-work; SD = standard deviation. Reported P-values resulted from t tests. Mann-Whitney U tests yielded similar findings.)

	With GRTW (N = 1875)	Controls (N = 1875)	P-value
	Mean (SD)	Mean (SD)	
Income (euros)			
2007	20.680 (11.481)	16.190 (15.098)	<0.001
2008	27.887 (15.452)	23.178 (18.329)	<0.001
2009	26.289 (16.723)	22.568 (18.985)	<0.001
2007–2009	74.856 (40.411)	61.937 (48.722)	<0.001
Sickness benefits (days)			
2007	131.9 (73.8)	170.1 (112.5)	<0.001
2008	30.4 (73.0)	42.6 (80.5)	<0.001
2009	29.1 (73.9)	31.0 (77.2)	0.453
2007–2009	191.4 (156.6)	243.6 (198.7)	<0.001
Short-term unemployment benefits (days)			
2007	4.0 (23.4)	17.2 (51.3)	<0.001
2008	18.2 (61.7)	50.4 (98.3)	<0.001
2009	18.9 (61.4)	31.9 (75.5)	<0.001
2007–2009	41.2 (110.5)	99.5 (161.2)	<0.001
Long-term unemployment benefits (days)			
2007	0.4 (7.4)	1.8 (20.8)	0.005
2008	1.0 (14.6)	4.5 (31.6)	<0.001
2009	3.8 (31.2)	14.0 (62.4)	<0.001
2007-2009	5.2 (42.5)	20.3 (95.9)	<0.001

to €15.873) and €12.889 (95% CI €10.020 to €15.757) in favor of GRTW patients. The effects on disability pension varied to some extent over the range of the propensity score. Effects were strongest below the first quartile and above the third quartile. However, effects did not differ significantly.

8.4 Discussion

Rehabilitation service research examines how services are routinely implemented and what is achieved by their usual application within a national health system. While clinical rehabilitation research focuses on the efficacy of an intervention in a more or less optimal setting with high treatment credibility and carefully selected patients, service research is interested in effectiveness, i.e. the effects under routine conditions. This is important as findings of service research and clinical rehabilitation research might differ (Schelvis et al., 2015). Service research is, however, challenged by the fact that randomized controlled trials, which could provide the best evidence, are hardly feasible to perform in the case of services that have already been implemented. Moreover, comprehensive data collection in usual care is difficult to achieve (Schelvis et al., 2015). In this study, administrative data and propensity score matching were used to analyse the effects of GRTW, a strategy frequently used in German rehabilitation care. The application of propensity score matching reduced bias when comparing work-disabled patients who started gradually returning to work, and work-disabled patients who did not. The use of administrative data allowed us to consider a large sample and to observe a follow-up period of up to three years. The findings indicate a moderate relative risk reduction of permanent work disability by about 40%. Moreover, the findings clearly show that GRTW is associated with a higher average income level and a reduction in time dependent on welfare benefits due to sickness absence and unemployment.

The absolute risk reduction of permanent work disability, however, was small, and the NNT was high with 31 persons needed to avoid one additional disability pensioner. However, additional analyses showed that the NNT decreased to only 13 persons among patients who started their rehabilitation program following a prompt by their health insurance agency due to long-term sick leave and severe chronicity. This and the similar finding related to the sickness absence duration indicate that the effect on a diminished disability pension risk is especially strong among patients with chronic handicaps. The potential effect of GRTW seems to be less if a return-to-work would be also possible without this additional therapeutic measure. Rehabilitation physicians need to consider that recommending GRTW for less restricted patients may be of no additional benefit even if patients and employers wish to use the opportunity of GRTW.

The arena of work disability as described by Loisel and colleagues (2005) involves many stakeholders (e.g. clinicians, workplace actors, insurance agencies, family and friends). Preventing permanent work disability and enabling a return to work therefore needs a strategy, which takes account of as many of these actors as possible in order to

develop a comprehensive and integrated strategy. This might explain, for example, that—despite the clear evidence that multimodal clinical interventions reduce pain and disability in patients with musculoskeletal disorders (Kamper et al., 2014)—the evidence of the effects on work participation are conflicting. While Schaafsma and colleagues reported small effects on work participation in workers with subacute and chronic back pain as compared with usual care or exercise treatment, Kamper and colleagues (2014) failed to identify an effect on work outcomes when they compared multidisciplinary programs to usual care. In contrast, the review by van Vilsteren and colleagues (2015) on workplace interventions demonstrated a clear benefit on work outcomes. Most of the interventions in the latter review involved clinical and workplace interventions, as the Sherbrooke model proposed by Loisel and colleagues (1997). We, therefore, see our findings in line with the review by van Vilsteren and colleagues (2015). Workplace involvement, especially by therapeutic work resumption and GRTW, seems to be a major component of a successful work rehabilitation strategy (Anema et al., 2009).

When interpreting the findings, the following limitations must be considered. First, though propensity score matching is a powerful tool to reduce bias, a propensity-score-matched analysis is still based on observational data only (Schelvis et al., 2015). It is not a randomized controlled trial. Consequently, the results are potentially biased by unobserved differences between cases and controls. Second, the risk of bias is increased as the amount of data that can be used for matching to reduce bias is clearly limited when using administrative data. Self-reported data could additionally support the estimation of the propensity scores. In the case of GRTW, factors like job strain, job satisfaction, fear avoidance beliefs, subjective return-to-work prognosis, self-rated work ability, return-to-work motivation and support from supervisors and colleagues are probably important predictors for considering a GRTW. For the additional use of self-reported data, large cohort studies are needed as described by Saltychev and colleagues in their papers on the propensity-score-matched analysis of the effects of the Finnish vocationally-oriented medical rehabilitation (Saltychev et al., 2012a, b, 2013). Additionally, linking of administrative and questionnaire data has to be realized to use questionnaire data for such analysis.

The limitations of the study are balanced by the following strengths. First, administrative data allows fairly complete, reliable and valid assessment of data. This was especially the case in this study for several indicators of work participation, which is the primary outcome of return-to-work strategies and vocational rehabilitation services. Second, using administrative data allows the inclusion of large samples. Third, using administrative data enables a long follow-up period to be observed without sample attrition. Fourth, propensity-score-matched analyses allowed us to determine figures such as the NNT, which are usually derived from randomized controlled trials and needed to appropriately communicate the benefit of an intervention.

8.5 Conclusion

In conclusion, this study demonstrates that the application of GRTW in usual rehabilitation practice supported return to work and sustainable work participation in patients who were still unable to perform full job duties at the end of their rehabilitation program. However, the results also indicate that the possibility of GRTW should be particularly considered for patients who started their rehabilitation program following a prompt by their health insurance agency due to long-term sick leave and severe chronicity. The additional effect on avoiding disability pensions among less-disabled patients does not seem to be clinically meaningful.

References

Anema, J. R., Schellart, A. J., Cassidy, J. D., Loisel, P., Veerman, T. J., & van der Beek, A. J. (2009). Can cross country differences in return-to-work after chronic occupational back pain be explained? An exploratory analysis on disability policies in a six country cohort study. *Journal of Occupational Rehabilitation, 19*(4), 419–426.

Aust, B., Helverskov, T., Nielsen, M. B., Bjorner, J. B., Rugulies, R., Nielsen, K., et al. (2012). The Danish national return-to-work program-aims, content, and design of the process and effect evaluation. *Scandinavian Journal of Work, Environment & Health, 38*(2), 120–133.

Bethge, M. (2016). Effects of graded return-to-work: a propensity-score-matched analysis. *Scandinavian Journal of Work, Environment & Health, 42*(4), 273–279.

Bethge, M. (2017). Rehabilitation und Teilhabe am Arbeitsleben [Rehabilitation and work participation]. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz, 60*(4), 427–435.

Bethge, M., Herbold, D., Trowitzsch, L., & Jacobi, C. (2011). Work status and health-related quality of life following multimodal work hardening: a cluster randomised trial. *Journal of Back and Musculoskeletal Rehabilitation, 24*(3), 161–172.

Bundesanstalt für Arbeitsschutz und Arbeitsmedizin. (2014). *Sicherheit und Gesundheit bei der Arbeit 2013 [Safety and health at work 2013]*. Dortmund: Bundesanstalt für Arbeitsschutz und Arbeitsmedizin.

Bürger, W., Glaser-Möller, N., Kulick, B., Pallenberg, C., & Stapel, M. (2011). Stufenweise Wiedereingliederung zulasten der gesetzlichen Rentenversicherung: Ergebnisse umfassender Routinedatenanalysen und Teilnehmerbefragungen [Stepwise occupational reintegration under the German pension insurance scheme–results of comprehensive routine data analyses and participants surveys]. *Rehabilitation, 50*(2), 74–85.

Dehejia, R. H., & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *The Review of Economics and Statistics, 84*(1), 151–161.

Descatha, A., Leclerc, A., & Herquelot, E. (2013). Use of propensity scores in occupational health? *Journal of Occupational and Environmental Medicine, 55*(5), 477–478.

Durand, M. J., & Loisel, P. (2001). Therapeutic return to work: rehabilitation in the workplace. *Work: Journal of Prevention, Assessment & Rehabilitation, 17*(1), 57–63.

Gatchel, R. J., & Mayer, T. G. (2008). Evidence-informed management of chronic low back pain with functional restoration. *The Spine Journal, 8*(1), 65–69.

Guo, S., & Fraser, M. W. (2010). *Propensity score analysis: statistical methods and applications*. Los Angeles: Sage Publications.

Higgins, A., O'Halloran, P., & Porter, S. (2012). Management of long term sickness absence: a systematic realist review. *Journal of Occupational Rehabilitation, 22*(3), 322–332.

Hoefsmit, N., Houkes, I., & Nijhuis, F. J. (2012). Intervention characteristics that facilitate return to work after sickness absence: a systematic literature review. *Journal of Occupational Rehabilitation, 22*(4), 462–477.

Ilmarinen, J. (2006). *Towards a longer worklife! Ageing and the quality of worklife in the European Union*. Finnish Institute of Occupational Health.

Ilmarinen, J. (2009). Work ability - a comprehensive concept for occupational health research and prevention. *Scandinavian Journal of Work, Environment & Health, 35*(1), 1–5.

Kamper, S. J., Apeldoorn, A. T., Chiarotto, A., Smeets, R. J., Ostelo, R. W., Guzman, J., et al. (2014). Multidisciplinary biopsychosocial rehabilitation for chronic low back pain. *The Cochrane Database of Systematic Reviews*, 9, Cd000963.

Krause, N., Dasinger, L. K., & Neuhauser, F. (1998). Modified work and returns to work: a review of the literature. *Journal of Occupational Rehabilitation, 8*(2), 113–139.

Loisel, P., Abenhaim, L., Durand, P., Esdaile, J. M., Suissa, S., Gosselin, L., et al. (1997). A population-based, randomized clinical trial on back pain management. *Spine, 22*(24), 2911–2918.

Loisel, P., Buchbinder, R., Hazard, R., Keller, R., Scheel, I., van Tulder, M., et al. (2005). Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *Journal of Occupational Rehabilitation, 15*(4), 507–524.

Lund, T., Kivimaki, M., Labriola, M., Villadsen, E., & Christensen, K. B. (2008). Using administrative sickness absence data as a marker of future disability pension: the prospective DREAM study of Danish private sector employees. *Occupational and Environmental Medicine, 65*(1), 28–31.

Norlund, A., Ropponen, A., & Alexanderson, K. (2009). Multidisciplinary interventions: review of studies of return to work after rehabilitation for low back pain. *Journal of Rehabilitation Medicine, 41*(3), 115–121.

OECD. (2010). *Sickness, disability and work: breaking the barriers. A synthesis of findings across OECD countries*. OECD Publishing.

Poulsen, O. M., Aust, B., Bjorner, J. B., Rugulies, R., Hansen, J. V., Tverborgvik, T., et al. (2014). Effect of the Danish return-to-work program on long-term sickness absence: results from a randomized controlled trial in three municipalities. *Scandinavian Journal of Work, Environment & Health, 40*(1), 47–56.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41–55.

Rosenbaum, P. R., & Rubin, D. B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *The American Statistician, 39,* 33–38.

Saltychev, M., Laimi, K., El-Metwally, A., Oksanen, T., Pentti, J., Virtanen, M., et al. (2012a). Effectiveness of multidisciplinary primary prevention in decreasing the risk of work disability in a low-risk population. *Scandinavian Journal of Work, Environment & Health, 38*(1), 27–37.

Saltychev, M., Laimi, K., Oksanen, T., Pentti, J., Kivimaki, M., & Vahtera, J. (2013). Does perceived work ability improve after a multidisciplinary preventive program in a population with no severe medical problems - the Finnish Public Sector Study. *Scandinavian Journal of Work, Environment & Health, 39*(1), 57–65.

Saltychev, M., Laimi, K., Oksanen, T., Pentti, J., Virtanen, M., Kivimaki, M., et al. (2012b). Effect of a multidisciplinary rehabilitation programme on perceived health among employees at increased risk of incapacity for work: a controlled study. *Clinical Rehabilitation, 26*(6), 513–522.

Schaafsma, F. G., Whelan, K., van der Beek, A. J., van der Es-Lambeek, L. C., Ojajarvi, A., & Verbeek, J. H. (2013). Physical conditioning as part of a return to work strategy to reduce sickness absence for workers with back pain. *Cochrane Database of Systematic Reviews*, 8, Cd001822.

Schelvis, R. M., Oude Hengel, K. M., Burdorf, A., Blatter, B. M., Strijk, J. E., & van der Beek, A. J. (2015). Evaluation of occupational health interventions using a randomized controlled trial: challenges and alternative research designs. *Scandinavian Journal of Work, Environment & Health, 41*(5), 491–503.

Seing, I., MacEachen, E., Stahl, C., & Ekberg, K. (2015). Early-return-to-work in the context of an intensification of working life and changing employment relationships. *Journal of Occupational Rehabilitation, 25*(1), 74–85.

Streibelt, M., & Bethge, M. (2014). Effects of intensified work-related multidisciplinary rehabilitation on occupational participation: a randomized-controlled trial in patients with chronic musculoskeletal disorders. *International Journal of Rehabilitation Research, 37,* 61–66.

Streibelt, M., Bürger, W., Nieuwenhuijsen, K., & Bethge, M. (2018). Effectiveness of graded return to work after multimodal rehabilitation in patients with mental disorders: a propensity score analysis. *Journal of Occupational Rehabilitation, 28*(1), 180–189.

van Vilsteren, M., van Oostrom, S. H., de Vet, H. C., Franche, R. L., Boot, C. R., & Anema, J. R. (2015). Workplace interventions to prevent work disability in workers on sick leave. *The Cochrane Database of Systematic Reviews*, 10, Cd006955.

Yassi, A., Tate, R., Cooper, J. E., Snow, C., Vallentyne, S., & Khokhar, J. B. (1995). Early intervention for back-injured nurses at a large Canadian tertiary care hospital: an evaluation of the effectiveness and cost benefits of a two-year pilot project. *Occupational Medicine, 45*(4), 209–214.

Part III
Work and Health

The Clinical Setting and Pathogenic Organizational Structures: A Survey Based on a Sociological Health Theory

9

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Abstract

"Work intensification" should be considered in the context of pathogenic organizational structures, including clinical settings. These work environments are especially notable in clinical areas concerning "multitasking", "insufficient human resource" and "unplanned additional tasks". A preliminary literature review revealed that few studies had been conducted related to the prevention of increasing workload. The current study used action field method in seven Munich settings (timeframe: one month) and a document analysis of relevant (focus-) health reports (inclusion criteria: ≥ 2012) which were analysed in parallel using Grounded Theory method. Results showed that the risk exposition in clinical settings is increased significantly if multiple distinctive characteristics of pathogenic organizational structures are present and which deviate substantially with regard to the work areas. The consequences seem to be that employees leave clinics or young talents show a lack of interest in engaging with these organizations. The discussion focus lies on immediate and proactive action in

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the clinical setting. In particular, it seems that this concerns the psychological risk exposures elucidated in a case example where possible solutions and modes of action are pointed out. Notably, a change in management processes cannot repair pathogenic organizations alone as they ought to be realized in its own contextual setting, which should finally lead to the development of desirable work environments for young talents in particular.

9.1 Introduction

Since the turn of the millennium psychosomatic consequences of changing work environments is given more empirical attention (DAK Psychoreport, 2015; Edmunds & Morris, 2000), in the context of hospital environment as well. The reason for this phenomenon could be attributed to the fact that sick leave and early retirement have fallen by 75% since 1965 (Deutsche Gesellschaft für Psychiatrie und Psychotherapie, Psychosomatik und Nervenheilkunde, 2015), while the rate of mental disorders increased during the period of 1997 to 2014. The Psycho Report of the German health insurance DAK estimates an increase of 209% (DAK-Gesundheit Forschung, 2016). Furthermore, the number of sick days compared to other diagnostic groups significantly increased, that is, 39.9 days of disability compared to "all diagnoses" with 12.3 days (Kliner et al. 2015). Adjustment disorder (ICD-10 diagnose F43, increase by 182%) and depression (ICD-10 diagnoses F32+F33, increase by 129%) show a particularly strong increase during a twelve-year evaluation (Kliner et al., 2015). In 2015, the "New quality of work" initiative identified the context of changing work environment and the phenomenon of "work intensification". Work intensification involves the increase of labor intensity, which could be defined as being more productive within a unit of time (Initiative Psychische Gesundheit in der Arbeit, 2016). A number of publications implicate this phenomenon of work intensification in the overall context of the "new world of work" of computation (Günther, 2007; Soucek, 2007). Current procedural developments are combined under the term "Industry 4.0" (Botthof & Hartmann, 2014; Sendler, 2013). The "fourth industrial revolution" (Bauernhansl, 2014) is motivated largely by the computerised production and logistical systems which may lead to negative health consequences for the employees. The rapid rise of mental illness related to Industry 4.0, the three phenomena of "multitasking", "inadequate staffing" and "unplanned additional tasks" have been identified in the modern industrial society and the environment clinic (Chia et al., 2019). Against this background, the theory of the pathogenic organization requires further investigation (Hurrelmann, 2006): Essentially, this means that by establishing structured and bureaucratized (large) organizations, the requirements of psychosocial human needs follow, and if these are not addressed systematically, the results could be the development of ill health at work (Hurrelmann, 2006). Despite the implementation of the "psychological stress at work" for medical practices, clinics, insurance companies, pharmaceutical and medical device companies, data sets are still not available.

The current study design was an expert survey (occupational physicians, occupational safety forces, health officers) in 100 companies (average number of employees: 1.027). Results of the national association of West German Social Accident Insurance (DGUV) and the Office for Occupational Safety underlined the need to create a risk assessment according to Sec. 5, para. 3 no. 6 German Labor Security Act. The top management/HR-departments (44%), professional bodies/occupational physicians (78%) and trade and staff councils (85%) were therefore included as experts. The high, often negatively experienced psychological stress, its relevance to the health and social sectors as well as the public administration, are often exacerbated in the relevant settings by constructional conditions. These include lack of opportunities for individual ventilation and heating systems, lack of individual PC tables, artificial light and noise (Naidoo & Wills, 2010). The following research questions were addressed: Which indicators are applied to interpret the current epidemiological situation of Industry 4.0 within medical settings? And how to implement procedures based on best-practice?

9.2 Method

The psychologist and philosopher Wilhelm Dilthey (1833–1911) gave the following statement: "We explain nature, the psychic life we understand" (Dilthey, 1894), a statement which has become a well-established methodological approach in social sciences. The decisive factor is that "understanding" is the principle of knowledge. In medicine, this basic hermeneutical attitude is primarily domiciled in anthropological medicine and in philosophically influenced psychiatry of the 20th century (von Engelhardt, 2002). Qualitative methods do not appear appropriate in the present case. This can be demonstrated as plausible in the context of the core concept of "understanding" and its extension in the term "meaning": a spiritual connection is here interpreted as "meaning"; it is not measurable and not directly observable, but understandable due to the fact that the interpreted and the interpreter have shared sense regions at least partially in common (Kaiser & Kaiser, 2001). In relation to the focus "psychological stress in the clinical setting," it was necessary to analyse historically grown, relevant connections to a changing world of work and their impact on the psyche of working people, suggesting the use of a Grounded Theory method. The Anglicism "grounded" implies the so-called "Subject Reason", a theory, which is based in the present context on the structured analysis of secondary data, observations, interviews and field documents. The key feature is the integration of "perception sensitivities, interpretation skills and language abilities of the scientist" (Breuer, 2010): The subjective construction of reality is highlighted in the current study. It finds its example in the preconstruct, the type of coding, and in the comparisons. The Grounded Theory is a qualitative research method that "uses a systematic set of procedures to develop an inductively derived, object-anchored theory about a phenomenon" (Strauss & Corbin, 1990, pp. 7–8). The preconstruct represents the first phase under the Grounded Theory method, the first results can be interpreted as "sensitizing concept"

(Böhm, 2010) or as a central theme of the research design; moreover, it implies a previous first data review in the form of "memo". As part of the preconstruct generation a document analysis, with a total of 13 general and focus health reports of statutory health insurance were elaborated from the years 2013 to 2015, was conducted. There were also five up-to-date identified documents of the Federal Institute for Occupational Safety and Health (BAUA), four documents of German Trade Unions (DGB) and four were determined to be relevant current journal articles. As a result of this first data review, the option of scientific theoretical connection to the theory of the pathogenic organization and sensitizing concept of insufficient health-promoting hospital as lifeworld could be confirmed. The first triangulable memos served in the second step of generating codes, which had a relevance to the theory and the main idea. "Encoding can be described as encrypting or translating data and includes the designation of concepts as well as their detailed explanation and discussion" (Böhm, 2010). The subject-related codes included in this preconstruct were "risk assessment psychological distress", "actors of prevention chain", "documentation", which resulted partly from the first above-described document analysis. This was supplemented by field observations of nurses studying health and social programs (B.A.) at the FOM University at the same time. Here, three interdisciplinary bed departments, a maternity ward and an intensive care unit of various hospitals with different levels of care, as well as an outpatient, owner-managed nursing service of the Munich Metropolitan Region were evaluated. In relation to the fourth coding "Good Practice Solutions", an expert interview was conducted with a Senior Programme Executive at the TÜV Süd, being centrally concerned with the "Corporate Health Award". A rehabilitation centre was also analysed, which in 2015 successfully took part in the competition "Great Place to Work". Success as size refers to a point system and the comparison value to the first participation in 2013. The four codings and related subcodings for the theory generating questions can be seen in Table 9.1.

In the Grounded Theory method the preconstruct is based on a triple coding. It consists of the phases open coding, axial coding and selective coding. The aim of the work step "open coding" is to "develop first, still preliminary concepts, followed by a host of new questions and new preliminary answers" (Przyborski & Wohlrab-Sahr, 2014). Even at this stage, the representatives of the Grounded Theory put emphasis on process-openness, which is reinforced by the notion "open". The first step, to apply openness, was also used in this case as an essential characteristic for distinguishing qualitative and quantitative methodological bundles: While the latter—regarded from the position of the hypothesis—applies a more or less procedurally-linear method, here, according to this basic idea of Grounded Theory, analysis had always been fedback into the preconstruct, from which the sensitizing concept was developed and whose current relevance was thus provided at all time during the analysis process. The "strong experimental nature" (Przyborski & Wohlrab-Sahr, 2014) during the period of open coding underlines these characteristic key questions (Böhm, 2010; Breuer, 2010):

Table 9.1 Codings and Subcodings as Basis for the Theory Generating Questions

Code	Subcodings
Psychological stress at work	(gender differentiated) epidemiology situational prevention low gratification time pressure (quantitative and qualitative work requirements) low decision-making scope staff shortage
Actors in chain of prevention	in-house medical service clinic management works council
Documentation	data collection instruments screening techniques questionnaires
Approaches "best practice"	credibility respect fairness pride team spirit

- Which education and setting specific risk factors "mental stress" are identified to be relevant in the documents and field observations?
- Are structures of company health management named, if so, how can they be described?
- Are internal health data adequately documented, if so, how frequently? (e.g. as a Health Balanced Scorecard (Froböse et al., 2008)).
- Which innovative approaches in the sense of "good practices" are identified?

The second step of Grounded Theory method provides a procedure, which is described as axial coding. "Axial coding puts those data back together in new ways by making connections between a category and its subcategories" (Strauss & Corbin, 1990). In the center of the presented research process each one of the codes was chosen and axial coding on the basis of Böhm was used (Böhm, 2010, p. 476).

In each case the code was placed as a central general term with subcodings of the three other codes in a cause-effect causality. For instance, when coding "actors in chain of prevention", "epidemiology" would be inserted as a causal condition, "everyday clinical practice" as context and intervening condition, "quality of workplace health promotion" as action strategy and "credibility" as consequence. Especially when coding "good practice", the relevance of the dimensions "context and intervening conditions" and "strategies" of coding paradigmata proved essential. Finally, the Grounded Theory method moves a step forward, which is called selective coding. Strauss and Corbin state that it was "not much different than axial coding. It is just done at a higher more abstract level

of analysis" (Strauss & Corbin, 1990, p. 97). It was found essential at this step to perform a compression work based on previous coding results. Thus, core codes arose that could be summarised according to the central phenomena. Overall, it was observed that the starting point was the assumption of the principle of minimum contrast; as many similarities in the data records as possible should be found. This minimization was transferred during the three-level coding in a maximum contrast at which signs of significant differences within a harmonious overall theme are identified. It was found that at the end of the axial coding the state of the "theoretical saturation" (Glaser & Strauss, 1998, p. 117) was also established. For transcription of field notes, the software "f5transkript" was used and for the creation of codes and their evaluation the software "MaxQDA12" was applied. Both software solutions permitted a less time-consuming work on large documents.

9.3 Results

A first literature research on the topic lead to the result that only a few publications and scientific projects concerning the prevention of increasing workload exist. Occupational research results concerning the clinical setting with the focus on the theory of pathogenic organizational structures in Germany had only been found once (Tempfer & Nowak, 2011, pp. 408–414). The focus is traditionally on the areas of medical and nursing staff. In the selected documents much less attention has been given to the therapeutic staff and the administration. Almost no attention has been given to the areas of technology, gardening and service personnel, the nutrition counselling, social services and the cleaning staff (mostly external service providers). The latter groups represent a substantial proportion of the total workforce and contribute to the functioning of the clinical system. Thus, they should be integrated into analytical processes, even if they are affected to a decisively lesser extent concerning the phenomenon of "work intensification" in the classic clinical context; above all, this setting, specifically multiple pressures and shift work have to be taken into consideration. This result is remarkable, not only from the perspective of empirical social research but also from the perspective of organizational sciences.

The research results concerning the first coding "Psychological Stress at Work" led to the following conclusion: With regard to the coding, the classical clinical work environments are affected by particular exposures in terms of work intensification. The following statement by one student participant underlines this:

> "The often overcrowded children emergency room is a particularly heavy burden because they must also be processed during ongoing hospital operations, without extra staff. The nurses and the doctors must regularly prioritise, who should take precedence—the patient on the ward or the ambulant patient—one of them will have to wait…" (Interview 2, IX).

Second, with respect to the used methodological variant of the observation of care workers assume a bias, which accentuates the care. Thirdly, it must have a gender-related distortion in advance of the performance analysis. Current health reports (Chevalier &

Kaluza, 2015; DAK-Gesundheit Forschung, 2016) show that mental and behavioral disorders (ICD 10-F-Group) show the strongest gender-related disparity between women and men regarding the disability action. Based on these three preliminary remarks, the clinical setting was recognised as a special work environment with significantly increased risk potential, because here

- people who are in the latter stages of disease are treated. Pain and fear are of different emotionality, but always directly witnessed and processed;
- many people are working with a professional "crisis of reimbursement", especially the groups of nurses and young doctors in training;
- are leeways in decision-making tight despite long training periods;
- the shortage of personnel and the lack of young professionals are more frequent than in other occupations;
- staff turnover is often greater than in other working environments and
- the activity carried out is often linked to liability and recourse risks.

In addition, more risky settings were identified, specifically parameters such as shift work, on-call duty, ergonomically unsound activities, but also the aforementioned structural defects such as fluorescent lighting, noise, the lack of individual control of the ventilation and heating systems, and lack of green spaces for the employees. A case study of a student participant states the following: "Even in case of illness, the colleagues are called by the nurse manager at home, if they can stand in on the first day after the termination of sick leave. If the staff refuses, they are called half an hour later by the nursing management. If the employee says, "I'm not well, I can't come to work," he receives the answer: "It can't be as bad, the sick leave is indeed only to…" That builds so much pressure and forces the still sick listed employees to work—but a week later they are sick again" (Interview 4, III). Similar statements in the analysis of documents confirm these descriptions of the state of matters.

The "Actors in chain prevention" (coding 2) frequently perform their job in a conservative way. With regard to the first coding "Psychological Stress at Work" it was determined, that only 12.3% of all German companies perform this regularised systematic stress analysis (Lenßen & Dutkiewicz, 2015). The primary obstacles to implementation are "lack of staff" (36.8%), "lack of knowledge" (33.3%) and "lack of information" (29.8%, multiple answers were possible). The authors' results not only confirm these results, but in six out of seven analysed clinical settings the situation seems to be more serious. The hierarchical structure of the organisation is a decisive criterion for this often perceived structure. With regard to the coding "actors of prevention chain" it was found that the implementation of Sec. 5, para. 3 no. 6 German Work Security Act had not been put into practice in any of the clinical settings.

The results of the third coding "documentation" showed that all analysed clinics employed a specialist, who was skilled in quality management. This is compatible with the Sec. 6 of the German Work Security Act "Documentation". These results were yet

insufficient, because unsatisfactory assessments did not lead to desired actions in the context of the organizational development. Adequate screening techniques were found in four out of six hospitals. Obviously, there was a lack of an implementation strategy for innovative approaches to a solution. This then led to negative emotions of dissatisfaction and frustration. As a basic principle of this result, it can be maintained, that action plans and real actions must follow after empirical surveys.

Results according to the fourth coding "good practice" primarily refers to the analysed rehabilitation clinic. With regard to the coding the authors identified one basic difference between this and the six other hospitals. The rehabilitation centre took part in the "Great Place To Work (GPTW)" competition twice (2013, 2015) for two reasons: On the one hand, this clinic is located in a rural and decentralized area that leads to a reduced attractiveness for young people (assistant doctors, care staff). On the other hand, the centre is marked by high quality management standards. This means that the GPTW resulting values led to next steps in context of the quality management circle (plan—do—check—act). Several accurate interventions were realised between 2013 and 2015. In consequence, the retest results of 2015 improved in all dimensions (credibility, respect, fairness, pride, team spirit) (Fig. 9.1). In the result of the 2015 test the relevant trade associations were admitted as a consultative capacity. The activities were carried out even though the first results were all of a high quality. All in all, it can be assumed that the consequent integration of a quality management system leads to improvements not only in the daily workflows but also in the often very different social levels in the clinical settings. Both analytic research methods complement each other.

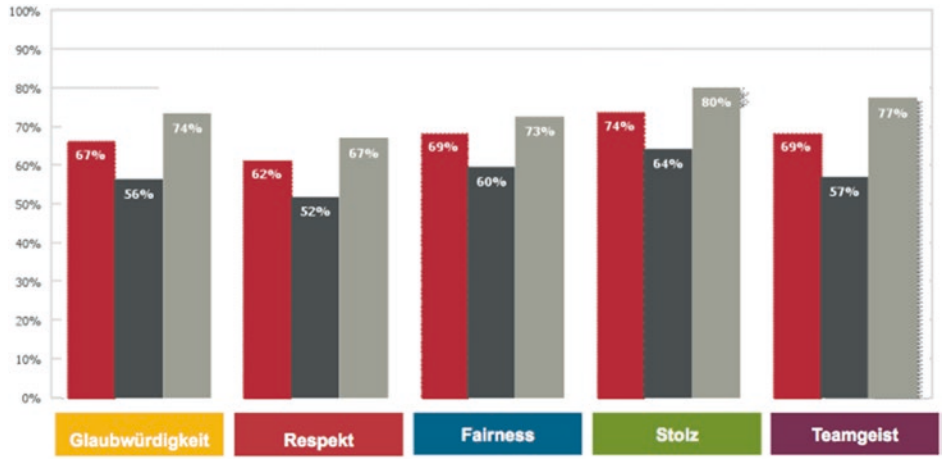

Fig. 9.1 Results of the Analysed Rehabilitation Centre in 2015 (bars to the left respectively) Compared to those of 2013 (bars in the middle respectively) and Benchmark Clinics (bars to the right respectively). Horizontal boxes represent from left to right: Credibility, Respect, Fairness, Pride, Team Spirit

9.4 Discussion

Both results of the literature research and the action field research were based on methods used in social sciences. With regard to this toolbox of qualitative and quantitative surveys, it is important to remember, that all results are based on individual processes of perception. The aforementioned mental stress consists of the triad awareness, perception and classification (Zimbardo, 1995). In this context, the analysis of the final classification "pathogenetic load situation" had to be performed as an interdisciplinary service process in all clinics—independent of the partially very different requirements (e.g. outpatient department, diagnostic department or intensive care). In relation to the initial question, another question follows: In general, is it possible to objectivise these subjective processes of perception? Against the background of this question, it seems to be worth mentioning, to reflect the earlier mentioned substantiating terms of pathogenic organizational structures (unplanned additional tasks, multi tasking and insufficient human resources) from the perspective of interdisciplinary processes. Specifically, the individual daily workflow has to be included in its particular working situation within a separate process flow analysis. In consequence of a then following triangulation, this procedure can lead to a so far not published employee-oriented, participative optimization of processes and interactions in all individual working situations. The goal of this intervention: to identify and reduce subjectively perceived types of stress based on an extended range of processual parameters. This means that two conditions are needed to be able to classify a clinical setting as a "pathogenic organizational structure". Firstly, a long term systematic analysis with regard to the psychological factors awareness, perception and classification, e.g. by using the ambulatory assessment method. Secondly, all situated, professional group-related in-house processes have to be analysed in an objectified way. Simultaneously, the methodical approach of action field research should lead to a hierarchy and working area independent analysis and management of process related conflicts. What follows regarding all foregoing results is that a partly significant potential for specified organizational development in the clinical setting can be found. However, this change management process has to happen under the conditions of an ongoing operation, which means that the realization may be exclusively established in each department. The challenge for "self-learning organization"-clinics is to implement a feedback system which not only focuses on the currently focused department but the whole system. All subsystems have to be involved in a regular flow of information during the role out-process in the case of publication of workshop results and those gained from evaluations. "Involvement of participants" should include all employees in all relevant process steps. Such a, in this context only indicated, solution of organization development will possibly be able to initiate a turnaround of currently pathogenic process institutional structures, both at the individual and at the organizational level.

9.5 Conclusion

Literature and action field research often concludes that clinical settings are perceived as pathogenic organizations. The current study adds a nuanced picture to previous research. The results show that processual objective parameters were ignored—as well as some specific professional departments of the clinical setting. When we talk about pathogenic clinics, a lack of knowledge related to the house keeping department, the administration or the technical service seems evident. In conclusion, it should be noted that the applied scientific research ought to be intensified and designed transdisciplinarily to prevent the development of pathogenic structures.

References

Bauernhansl, T. (2014). Die Vierte Industrielle Revolution – Der Weg in ein wertschaffendes Produktionsparadigma. In: T. Bauernhansl, M. Hompel, & B. Vogel-Heuser (Hrsg.), *Industrie 4.0: Produktion, automatisierung und logistik* (pp. 5–35). Wiesbaden: Springer.

Böhm, A. (2010). Theoretisches Codieren: Textanalyse in der grounded theory. In: U. Flick, E. Kardorff von, & I. Steinke (Hrsg.), *Qualitative Forschung: Ein Handbuch.* (p. 479). Reinbek b. Hamburg: Rowohlt.

Botthof, A., & Hartmann, E. A. (2014). *Zukunft der Arbeit in Industrie 4.0.* Springer Vieweg.

Breuer, F. (2010). *Reflexive Grounded Theory: Eine Einführung für die Forschungspraxis.* Springer VS.

Chevalier, A., & Kaluza, G. (2015). Psychosozialer Stress am Arbeitsplatz: indirekte Unternehmenssteuerung, selbstgefährdendes Verhalten und die Folgen für die Gesundheit. https://www.bertelsmannstiftung.de/fileadmin/files/Projekte/17_Gesundheitsmonitor/Newsletter_Gesundheitsmonitor_selbstgefaehrdendes_Verhalten_20150316.pdf. Accessed 11 Feb 2020.

Chia, G., Lim, S. M., Sng, G. K. J., Hwang, Y. F. J., & Chia, K. S. (2019). Need for a new workplace safety and health (WSH) strategy for the fourth Industrial Revolution. *American Journal of Industrial Medicine, 62*(4), 275–281.

DAK Psychoreport. (2015). Psychoreport 2015: Deutschland braucht Therapie. Herausforderungen für die Versorgung. https://www.spiegel.de/karriere/dak-psychoreport-fehltage-durch-psychische-leiden-auf-rekordniveau-a-1059748.html. Accessed 11 Feb 2020.

DAK-Gesundheit Forschung. (2016). DAK-Gesundheitsreport für Bayern (pp. 14–18). Self book printer.

Dilthey, W. (1994). Ideen über eine beschreibende und zergliedernde psychologie. In: F. Breuer (Hrsg.), *Reflexive Grounded Theory: Eine Einführung für die Forschungspraxis.* Springer VS. (Erstveröffentlichung 1894).

Edmunds, A., & Morris, A. (2000). The problem of information overload in businessorganisations: a review of the literature. *International Journal of Information Management, 20*(1), 17–28.

Froböse, I., Wellmann, H., & Weber, A. (2008). *Betriebliche Gesundheitsförderung*. Gentner.

Glaser, B.G., & Strauss, A. (1998). *Grounded Theory: Strategien qualitativer Forschung.* Huber.

Günther, J. (2007). *Digital natives and digital immigrants.* StudienVerlag.

Hurrelmann, K. (2006). *Gesundheitssoziologie: Eine Einführung in sozialwissenschaftliche-Theorien von Krankheitsprävention und Gesundheitsförderung.* Juventa.

Initiative Psychische Gesundheit in der Arbeit. (2016). Arbeitsverdichtung: Termindruck, E-mailFlut und Multitasking – Warum wir immer mehr auf einmal bewältigen müssen. http://psyga.info/stress-vermeiden/arbeitsverdichtung/. Accessed 11 Feb 2020.

Kaiser, A., & Kaiser, R. (2001). *Studienbuch Pädagogik*. Cornelsen.

Kliner, K., Rennert, D., & Richter, M. (2015). BKK Gesundheitsatlas 2015: Gesundheit in Regionen – Blickpunkt Psyche. https://www.bkk-dachverband.de/fileadmin/publikationen/gesundheitsatlas/BKK_Gesundheitsatlas_2015.pdf. Accessed 24 Mar 2020.

Lenßen, K., & Dutkiewicz, P. (2015). Gefährdungsbeurteilung psychischer Belastungen am Arbeitsplatz: aktuelle Praxis und Herausforderung für deutsche Unternehmen. http://www.gefaehrdungsbeurteilung.de/de/neues/3_quartal_2015/article.2015-07-10. Accessed 11 Feb 2020.

Naidoo, J., & Wills, J. (2010). *Lehrbuch der Gesundheitsförderung.* BGgA.

Przyborski, A., & Wohlrab-Sahr, M. (2014). *Qualitative Sozialforschung: Ein Arbeitsbuch*. Oldenbourg.

Sendler, U. (2013). *Industrie 4.0: Beherrschung der industriellen Komplexität mit system.* Springer-Vieweg.

Soucek, R. (2007). Informationsüberflutung: E-mails im Beruf. In A. Weber & G. Hörmann (Eds.), *Psychosoziale Gesundheit im Beruf* (pp. 291–298). Stuttgart: Gentner.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Sage.

Tempfer, C. B., & Nowak, P. (2011). Consumer participation and organizational development in health care: a systematic review. *Wiener Klinische Wochenschrift, 123*(13–14), 408–414.

Von Engelhardt, D. (2002). Krankheit und Tod zwischen Naturphilosophie und Bioethik. In H. W. Ingensiep & A. Eusterschulte (Eds.), *Philosophie der natürlichen Mitwelt: Grundlagen – Probleme – Perspektiven*. Würzburg: Königshausen Neumann.

Zimbardo, P. (1995). *Psychologie.* Springer.

Cognitive Performance in Occupational and Work-Related Rehabilitation

10

Thomas Johansen

Abstract

Occupational rehabilitation, part of the specialist health care services, has existed in Norway for more than 25 years. Individuals who are on long-term sick leave can be offered occupational rehabilitation, based on cognitive interventions and physical activity, aiming to improve functioning and work ability, self-efficacy related to home and work tasks and sustainable return to work. However, a surprisingly small number of empirical studies have been conducted to evaluate and document the quality and effect of the cognitive interventions. Thus, it is essential to investigate the relationship between cognitive and emotional factors and return to work; in particular memory, attention, executive function and appraisal of emotional stimuli from faces, pictures and words. Therefore, the application of the cognitive psychological approach in this field is original. The elucidation of which cognitive changes take place during occupational and work-related rehabilitation in individuals reporting anxiety, depression and musculoskeletal pain should improve the quality of rehabilitation programmes. Relevant empirical literature and its clinical implications along with recommendations for future studies are highlighted.

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10.1 Introduction

Participation in working life is important and there is a strong focus on getting people who fall out of the labor market back to work. In Norway, approximately 600.000 individuals between 18 and 64 years remain outside the labor market relying on health related benefits, such as sick leave benefits and disability benefits. Norway has, compared to other OECD countries, a high prevalence of sick leave (OECD, 2013). Psychological health complaints such as anxiety, depression and musculoskeletal pain are the most common causes of sickness absence (OECD, 2012, 2013) and the economic consequences due to disability pension in Norway were estimated to be around NOK56 billion in 2011 (Ministry of Finance, 2010). Inpatient occupational rehabilitation, a form of work-related rehabilitation, has been offered in Norway for more than 25 years. The aim of this intervention is to provide comprehensive work-related rehabilitation to increase the likelihood of sustainable return to work (RTW) for sick-listed patients. Individuals referred to occupational rehabilitation from general practitioners and the Norwegian Labor and Welfare Administration are either not working or on health related benefits or at risk of falling out of the labor market. The referrals are commonly due to anxiety, depression, musculoskeletal pain and subjective health complaints. The rehabilitation programmes are tailored to improve the patients' level of functioning, physical fitness and work ability based on principles from cognitive behavioural therapy, here named as cognitive treatment components (Johansen et al., 2016). In Norway, a 3.5 week inpatient occupational rehabilitation programme has been found to increase RTW more for individuals with anxiety, depression and musculoskeletal pain compared to outpatient rehabilitation (Gismervik et al., 2020). While a shorter inpatient occupational rehabilitation programme, consisting of a four day inpatient stay, in week one and four, with two weeks at home in between, compared to an outpatient programme lasting six weeks and included one acceptance and commitment therapy session per week, did not result in any differences in RTW (Aasdahl et al., 2018). This indicates that a more comprehensive and longer inpatient programme has greater effects on RTW than a shorter programme. However, a systematic assessment of the role of cognitive factors, such as memory, attention and executive function, and linking these factors to employment status and RTW has been an understudied topic and deserves more empirical weight.

The application of cognitive psychology to the investigation of psychological health complaints has increased in recent years (Williams et al., 1997; Yiend, 2010), coinciding with a greater focus on anxiety and depression related to the working life (Johansen et al., 2019). Cognitive abilities such as memory, attention and executive function are critical for successful work performance (Fisher et al., 2019) and improvement in sustained attention and working memory during occupational rehabilitation is found to predict RTW (Johansen et al., 2021). Reduced attentional capacity has also been found to be detrimental to work ability (Johansen et al., 2019; Øie et al., 2011). Participation in working life is generally considered to have beneficial effects on mental health (Burdorf & Robroek, 2020; Waddell & Burton, 2006) and cognitive functioning (Fisher et al.,

2019). Cognitive and emotional factors, such as creative thinking, manipulation of information, exposure to emotional situations, and mental planning are prerequisites for a productive working life (Shaw & Lysaght, 2008). Occupational competence requires skills at a cognitive, emotional and workplace level (Fisher et al., 2019).

Individuals on long-term sick leave often report subjective health complaints, which covers a wider and more specific range of complaints compared to psychological health complaints (Ihlebæk et al., 2002). They include complaints such as musculoskeletal, pseudoneurological (e.g., fatigue, dizziness), gastrointestinal, allergy and influenza. It has been found that patients on sick leave report on average 12 complaints out of 29 possible (Øyeflaten et al., 2008) and the degree of comorbidity is detrimental to work ability (Kamaleri et al., 2009). To understand subjective and psychological health complaints at the cognitive level, one important aspect can be to elucidate it through the concept of sensitization, which resembles cognitive bias or more specifically attentional bias (Brosschot, 2002), because the attentional system is thought to automatically be drawn to particular somatic stimuli or environmental situations (Yiend, 2010). Individuals vulnerable to anxious states are thought to attend to material of fear-related content (Williams et al., 1997). What characterizes anxiety is the bias or even priority in attentional resources given to threat over other stimuli. Similarly, depressed individuals seem to allocate attention towards negative thoughts and information, which suggests that negative information is more readily recollected than positive information (Yiend, 2010). Deficits in the interaction between cognition and emotion, for example, biased attentional processing of emotional information, are thought to play both a causal and maintaining role in anxiety and depression (Yiend, 2010).

A stronger focus on cognitive concepts of appraisal and attentional bias seems a fruitful avenue to explore systematically in occupational rehabilitation, contributing to a better understanding of how subjective cognitive, emotional and health complaints are associated with objective cognitive impairments (Johansen et al., 2019). This approach attempts to characterise objective, measureable differences characterised by rather subjective criteria, namely the patients' health complaints.

10.2 Cognitive Impairments and Sick Leave

The cognitive performance in individuals on sick leave and in individuals working but reporting psychological health complaints has been studied using different study designs. The majority of studies have used a cross sectional design while prospective studies are lacking. Some studies have also investigated the effect of rehabilitation or different forms of cognitive therapies on cognitive functioning and RTW, while randomised controlled trials are lacking to elucidate the clinical effect of interventions. Research investigations probing the association between cognitive test performance and sick leave are still scarce in individuals reporting mild to moderate symptoms of anxiety, depression, musculoskeletal pain, stress-related burnout and fatigue (e.g., Österberg et al., 2009).

The majority of selected studies investigating the relationship between cognitive impairments and sick leave have employed a cross-sectional study design. This type of design is susceptible to time of measurement effects as any changes in cognitive functioning or psychological health complaints are not captured. Therefore, longitudinal designs using both within and between groups repeated measures analysis linked to RTW are warranted. Individuals are thus tested at onset of sick leave or recruited when commencing work-related rehabilitation, and followed up at different time points. It is of importance to conduct pretests and posttests to assess changes in cognitive functioning during interventions. Another issue that needs to be taken into account is the presence of comorbid complaints. These could be considered as both mediating and moderating factors associated with cognitive performance. Individuals reporting burnout, also report symptoms of anxiety, depression and somatic complaints (Österberg et al., 2009), which could persist even after recovery (Österberg et al., 2012). This is also the case for individuals reporting anxiety and depression presenting with comorbid pain and fatigue symptoms (Johansen et al., 2016, 2019). On a general note, the comparison of cognitive findings across studies is challenging due to the variety and number of cognitive tests employed and the generally low sample sizes in some studies (Snyder et al., 2015).

Results of studies recruiting individuals on sick leave diagnosed with stress-related burnout seem to point towards impairments in executive function, working memory and sustained attention (Österberg et al., 2014). Individuals going through four-week inpatient occupational rehabilitation and reporting mild to moderate anxiety, depression, and pain improved more during rehabilitation than individuals working full time in working memory and selective and sustained attention (Johansen et al., 2016, 2019). However, these studies only conducted pretest and posttest assessments and improvements in cognitive functioning were not investigated in relation to RTW. In two different studies conducting testing before and after work-related treatment reported that women sick-listed for work-related stress and depression and receiving 10 weeks of work-related cognitive behavioural therapy improved more in attention and working memory compared to a control group (Rydmark et al., 2006; Wahlberg et al., 2009). A weakness in these two studies is the fact that a new control group was recruited at one year follow-up and the authors failed to report performance measures based on a within group repeated measures analysis. Similarly, Eskildsen et al. (2015, 2016) retested a group of patients on sick leave due to work-related stress one year after being referred for occupational and psychological therapy. It was found that patients performed worse in prospective memory and processing speed compared to a healthy control group, both at pretest and posttest. Therefore, tentatively, it can be concluded that the therapy did not work when assessed in terms of cognitive functioning. Here, patients did not receive therapy in a systematic manner and several patients sought therapy privately in addition to occupational therapy related to the study design. This seems a methodological flaw and makes the interpretation of findings challenging. The majority of patients had returned to work, but the association between cognitive functioning and employment status was not taken into account.

In terms of self-reported memory complaints in individuals diagnosed with stress-related exhaustion, no difference in performance on tests measuring executive function, working memory and attention was found between those scoring high and low in complaints (Jonsdottir et al., 2013). So far, two studies have found that self-reported cognitive complaints predict sickness absence and work disability (Pihlajamäki et al., 2020, 2021) and one study has reported that objectively measured sustained attention and working memory, but not spatial planning, attentional set-shifting and emotion recognition, predict the number of days on health related benefits in the year after rehabilitation (Johansen et al., 2021).

Another interesting aspect related to cognitive functioning is whether patients' subjective cognitive functioning (self-rated questionnaires) is associated with objective cognitive test performance. Some studies report no association between subjective and objective measures, despite improvements on questionnaires measuring cognitive functioning such as memory and attention (Österberg et al., 2009, 2012, 2014), while one study indicated that self-reported cognitive difficulties are associated with actual cognitive performance (van der Linden et al., 2005). Also, subjective and objective improvements in cognitive functioning have not been found to be related to work resumption (Österberg et al., 2012, 2014).

Taken together, research designs have not been rigorous enough to allow for an analysis of the association between cognitive test performance, work-related interventions and RTW. Data on sick leave and employment status are in most studies reliant on self-report as opposed to register-based data from the labor authorities.

10.3 Clinical Implications

The aim of occupational and work-related rehabilitation is to improve work ability and to increase the likelihood of sustainable RTW. The majority of individuals falling out of the labor market often receive treatment in the primary health care services or through workplace-based interventions. Individuals on long-term sick leave can be referred to the specialist health care services. Work-related rehabilitation is often based on principles from cognitive behavioural therapy and emotion-focused cognitive behavioural therapy (Gismervik et al., 2020). Despite the strong focus on the cognitive approach in Norway, there is scarce empirical knowledge investigating the quality and effect of work-related interventions from a cognitive perspective. The standardised methods in cognitive psychology are well-documented and reliable and adopting these further in terms of investigating the effects of interventions on cognitive and emotional functioning and RTW is warranted. Such investigations should be replicable across clinics and institutions focusing on work-related rehabilitation considering the standardised methodology.

Improvements in memory and attention strengthens the ability to stay focused, be concentrated, process information, and shift focus as required. Experiencing greater cognitive control and attentional capacity, that is, having more mental resources, generates

more flexible behaviour and enables individuals to have better thought control (Johansen et al., 2021). These are vital factors to succeed in modern working life (Beier & Oswald, 2012; Fisher et al., 2019). This sheds light on the relationship between improvement in cognitive functioning and mental health (Yiend, 2010). It is postulated that the treatment success of work-related rehabilitation is therefore dependent upon targeting more specifically cognitive factors for sustainable and earlier RTW, preferably through better integration of emotion-focused cognitive behavioural therapy (Power, 2010; Reme et al., 2009) and work-focused cognitive behavioural therapy (Lagerveld et al., 2012). This is in line with research revealing that fear of RTW and dysfunctional appraisals of psychological health complaints should be treatment targets in occupational rehabilitation (Øyeflaten et al., 2008). The elucidation of the effects of cognitive treatment components related to psychological health complaints (Reme et al., 2009) integrated with cognitive and emotional training to improve work ability (Aasvik et al., 2017; Jonassen et al., 2019; McGurk et al., 2007) may be worth giving more empirical weight in future studies. This supports recommendations that systematic assessments of cognitive functioning in clinics offering occupational and work-related rehabilitation should be conducted at pretest to individually tailor the rehabilitation programmes (Johansen et al., 2019).

10.4 Recommendation for Future Studies

The majority of individuals on sick leave receiving work-related rehabilitation report psychological health complaints (Øyeflaten et al., 2008). Therefore, studying which cognitive factors are preventing these individuals to RTW is highly recommended. As already elucidated, an aspect of cognitive functioning that has not been addressed so far is emotional processing and emotion regulation (Yiend, 2010). Anxiety, depression and pain are thought to stem, in part, from dysfunctions in the interaction between cognition and emotion (Brosschot, 2002; Yiend, 2010). The interaction between cognition and emotion seems to depend on executive functioning (Zelazo & Cunningham, 2009), and psychological health complaints may therefore be triggered by an inability to shift attentional focus, suggesting impairments related to inhibition, shifting, updating and working memory (Miyake et al., 2000). The interaction between cognition and emotion is therefore an avenue worth investigating in detail to better understand psychological health complaints in sick-listed patients. Research designs will be strengthened by introducing, in addition to cognitive tasks, also emotional tasks, such as face and smell recognition and emotional and work-related versions of the Stroop and dot probe tasks (see Yiend, 2010, for a summary of tasks).

Specific cognitive training of attention and memory seems to increase work participation for individuals with severe mental disorders (McGurk et al., 2007). That is, whether an add-on intervention such as computerised cognitive training leads to greater improvements in cognitive functioning, psychological health complaints and more sustainable RTW compared to standard work-related rehabilitation. The treatment success

of work-related interventions may depend on increasing the cognitive capacity of participants to achieve the most sustainable RTW (Aasvik et al., 2017; Reme et al., 2009). Designing rigorous studies investigating the effects of work-related cognitive training on RTW is recommended.

Key research questions include whether occupational and work-related rehabilitation improve cognitive and emotional functions, the degree to which cognitive and emotional functioning impact on the RTW process, and whether cognitive and emotional functioning varies as a function of the duration of sick leave, anxiety, depression and pain complaints. These associations should be investigated prospectively to follow up changes in cognitive functioning, not only after one year but also after several years (Eskildsen et al., 2016; Johansen et al., 2016; Österberg et al., 2014). It may also be the case that traditional cognitive tests are not sensitive and specific enough in elucidating the relationship between cognition and RTW in individuals attending work-related rehabilitation as these tests were validated on individuals not aiming to RTW. The specificity and sensitivity of tests may also be an avenue worth looking into further. It has been recommended that sustainable RTW should be measured as staying in work four weeks without relapse (Biering et al., 2013) and should be taken into account when deciding upon a definition of sustainable RTW.

It may be assumed that the most cognitively able individuals are those most likely to secure employment across different patient groups. Therefore, to demonstrate a specific interaction with rehabilitation is to show that this relationship is stronger in patient groups receiving work-related rehabilitation compared to individuals receiving other non-specialised work-related rehabilitation and those working full time. The recruitment of both homogeneous and heterogeneous patient groups based on psychological health complaints and cognitive and emotional functioning will enable research to reach stronger conclusions regarding the quality and effect of different types of work-related interventions on RTW.

10.5 Conclusion

The relationship between cognitive and emotional functioning, cognitive treatment components and psychological health complaints seems important to better understand and to advance clinical and research competencies within this field of occupational and work-related rehabilitation. The overarching aim, based on empirical findings, should be to improve existing interventions and to implement new and evidence-based cognitive treatment components in occupational and work-related rehabilitation. For example, work-focused cognitive behavioural therapy seems to have a greater effect on RTW compared to traditional cognitive behavioural therapy. A stronger work-focus in evidence-based therapies, also taking into account the interaction between cognition and emotion, is assumed to be advancing this field forward and may result in faster and prolonged RTW for individuals receiving occupational and work-related rehabilitation.

References

Aasdahl, L., Pape, K., Vasseljen, O., Johnsen, R., Gismervik, S., Halsteinli, V., et al. (2018). Effect of inpatient multicomponent occupational rehabilitation versus less comprehensive outpatient rehabilitation on sickness absence in persons with musculoskeletal- or mental health disorders: a randomized clinical trial. *Journal of Occupational Rehabilitation, 28*, 170–179.

Aasvik, J. K., Woodhouse, A., Stiles, T. C., Jacobsen, H. B., Landmark, T., Glette, M., et al. (2017). Effectiveness of working memory training among subjects currently on sick leave due to complex symptoms. *Frontiers in Psychology, 7,* 2003.

Beier, M. E., & Oswald, F. L. (2012). Is cognitive ability a liability? A critique and future research agenda on skilled performance. *Journal of Experimental Psychology: Applied, 18,* 331–345.

Biering, K., Hjøllund, N. H., & Lund, T. (2013). Methods in measuring return to work: a comparison of measures of return to work following treatment of coronary heart disease. *Journal of Occupational Rehabilitation, 23,* 400–405.

Brosschot, J. F. (2002). Cognitive-emotional sensitization and somatic health complaints. *Scandinavian Journal of Psychology, 43,* 113–121.

Burdorf, A., & Robroek, S. (2020). Trajectories from work to early exit from paid employment. In U. Bültmann & J. Siegrist (Eds.), *Handbook of disability, work and health* (pp. 71-84). Springer International Publishing.

Eskildsen, A., Andersen, L. P., Pedersen, A. D., & Andersen, J. H. (2016). Cognitive impairments in former patients with work-related stress complaints – one year later. *Stress, 19,* 559–566.

Eskildsen, A., Andersen, L. P., Pedersen, A. D., Vandborg, S. K., & Andersen, J. H. (2015). Work-related stress is associated with impaired neuropsychological test peformance: a clinical cross-sectional study. *Stress, 18,* 198–207.

Fisher, G. G., Chacon, M., & Chaffee, D. S. (2019). Theories of cognitive aging and work. In B. B. Baltes, C. W. Rudolph, & H. Zacher (Eds.), *Work across the lifespan* (pp. 17–45). Academic Press.

Gismervik, S. Ø., Aasdahl, L., Vasseljen, O., Fors, E. A., Rise, M. B., & Johnsen, R., et al. (2020). Inpatient multimodal occupational rehabilitation reduces sickness absence among individuals with musculoskeletal and common mental health disorders: a randomized clinical trial. *Scandinavian Journal of Work, Environment & Health, 46*, 364–372.

Ihlebæk, C., Eriksen, H. R., & Ursin, H. (2002). Prevalence of subjective health complaints (SHC) in Norway. *Scandinavian Journal of Public Health, 30,* 20–29.

Johansen, T., Jensen, C., Eriksen, H. R., Lyby, P. S., Dittrich, W. H., Holsen, I. N., et al. (2019). Occupational rehabilitation is associated with improvements in cognitive functioning. *Frontiers in Psychology, 10,* 2233.

Johansen, T., Øyeflaten, I., Eriksen, H. R., Lyby, P. S., Dittrich, W. H., Holsen, I., et al. (2021). Sustained attention and working memory predict the number of days on health-related benefits in the year following occupational rehabilitation. *Journal of Occupational Rehabilitation*, 31, 592–603.

Johansen, T., Skjerve, A., Jensen, C., Dittrich, W. H., & Øyeflaten, I. (2016). Changes in cognitive functioning in sick-listed participants in occupational rehabilitation: a feasibility study. *Scandinavian Journal of Occupational Therapy, 23*, 437–445.

Jonsdottir, I. H., Nordlund, A., Ellbin, S., Ljung, T., Glise, K., Währborg, P., et al. (2013). Cognitive impairment in patients with stress-related exhaustion. *Stress, 16,* 181–190.

Kamaleri, Y., Natvig, B., Ihlebæk, C. M., & Bruusgaard, D. (2009). Does the number of musculoskeletal pain sites predict work disability? A 14-year prospective study. *European Journal of Pain, 13,* 426–30.

Lagerveld, S. E., Blonk, R. W. B., Brenninkmeijer, V., Meij, L., & Schaufeli, W. B. (2012). Work-focused treatment of common mental disorders and return to work: a comparative outcome study. *Journal of Occupational Health Psychology, 17,* 220–234.

McGurk, S. R., Mueser, K. T., Feldman, K., Wolfe, R., & Pascaris, A. (2007). Cognitive training for supported employment: 2–3 year outcomes of a randomized controlled trial. *American Journal of Psychiatry, 164,* 437–441.

Ministry of Finance. (2010). Prop. 1 S (2010–2011). *Gul bok Statsbudsjettet 5. Folketrygdens utgifter og inntekter*. Finansdepartementet.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "Frontal Lobe" tasks: a latent variable analysis. *Cognitive Psychology, 41,* 49–100.

OECD. (2012). *Sick on the job? Myths and realities about mental health and work.* OECD, Paris.

OECD. (2013). *Mental health and work: Norway.* OECD, Paris.

Österberg, K., Karlson, B., & Hansen, Å. M. (2009). Cognitive performance in patients with burnout, in relation to diurnal salivary cortisol. *Stress, 12,* 70–81.

Österberg, K., Karlson, B., Malmberg, B., & Hansen, Å. M. (2012). A follow-up of cognitive performance and diurnal salivary cortisol changes in former burnout patients. *Stress, 15,* 589–600.

Österberg, K., Skogsliden, S., & Karlson, B. (2014). Neuropsychological sequelae of work-stress-related exhaustion. *Stress, 17,* 59–69.

Øie, M., Sundet, K. S., & Ueland, T. (2011). Neurocognition and functional outcome in early-onset schizophrenia and attention-deficit/hyperactivity disorder: a 13-year follow-up. *Neuropsychology, 25,* 25–35.

Øyeflaten, I., Hysing, M., & Eriksen, H. R. (2008). Prognostic factors associated with return to work following multidisciplinary vocational rehabilitation. *Journal of Rehabilitation Medicine, 40,* 548–554.

Pihlajamäki, M., Arola, H., Ahveninen, H., Ollikainen, J., Korhonen, M., Nummi, T., et al. (2020). Subjective cognitive complaints and sickness absence: a prospective cohort study of 7059 employees in primarily knowledge-intensive occupations. *Preventive Medicine Reports, 19,* 101103.

Pihlajamäki, M., Arola, H., Ahveninen, H., Ollikainen, J., Korhonen, M., Nummi, T., et al. (2021). Subjective cognitive complaints and permanent work disability: a prospective cohort study. *International Archives of Occupational and Environmental Health.* doi: 10.1007/s00420-020-01643-1.

Power, M. (2010). *Emotion-focused cognitive therapy*. Wiley-Blackwell.

Reme, S. E., Hagen, E. M., & Eriksen, H. R. (2009). Expectations, perceptions, and physiotherapy predict prolonged sick leave in subacute low back pain. *BMC Musculoskeletal Disorders, 10,* 139.

Rydmark, I., Wahlberg, K., Ghatan, P. H., Modell, S., Nygren, Å., Ingvar, M., et al. (2006). Neuroendocrine, cognitive and structural imaging characteristics of women on longterm sick leave with job stress–induced depression. *Biological Psychiatry, 60,* 867–873.

Shaw, L., & Lysaght, R. (2008). Cognitive and behavioral demands of work. In K. Jacobs (Ed.), *Ergonomics for therapists* (pp. 103–122). St. Louise: Mosby Elsevier.

Snyder, H. R., Miyake, A., & Hankin, B. L. (2015). Advancing understanding of executive function impairments and psychopathology: bridging the gap between clinical and cognitive approaches. *Frontiers in Psychology, 6,* 328.

Van der Linden, D., Keijsers, G. P. J., Eling, P., & van Schaijk, R. (2005). Work stress and attentional difficulties: an initial study on burnout and cognitive failures. *Work and Stress, 19,* 23–36.

Waddell, G., & Burton, A. K. (2006). *Is work good for your health and well-being?* The Stationary Office, London, UK.

Wahlberg, K., Ghatan, P. H., Modell, S., Nygren, Å., Ingvar, M., Åsberg, M., et al. (2009). Suppressed neuroendocrine stress response in depressed women on job-stress related long-term sick-leave: a stable marker potentially suggestive of pre-existing vulnerability. *Biological Psychiatry, 65,* 742–747.

Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorders* (2nd ed.). Wiley.

Yiend, J. (2010). The effects of emotion on attention: a review of attentional processing of emotional information. *Cognition and Emotion, 24,* 3–47.

Zelazo, P. D., & Cunningham, W. A. (2009). Executive function mechanisms underlying emotion regulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 135–158). New York: The Guildford Press.

The Unconscious Effects of Rehabilitation: The Impact of Implicit Motives on Rehabilitation, Therapy and Health

11

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Abstract

The number of chronically ill patients in high-income countries rises dramatically. Therefore, organisations invest in return to work programs. The basic idea of rehabilitation is to give people the chance to live a self-determined life. An important aspect of this process is rehabilitation psychology. In the role of a patient, every person should operate in his best possible interests, and should learn to make the right medical decisions for their future life. Weeks before, this person was an expert in decision-making, merely in his work environment. As a patient, this person is just a layman with a huge overload of data, information and therapies. This person has still the same intuition, the same implicit program and he or she still needs motivation. The methodology is primarily based on secondary data. This chapter uses a deductive approach, as implicit effects based on models and decision-making will be observed in correlation with basic models.

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For the analysis, quantitative and qualitative data taken from other studies by the authors are used. The new information overflow in the medical field empowers patients and at the same time shifts responsibility to them and contributes to the complexity of self-managing illness and rehabilitation. For the patients, health and rehabilitation becomes a kind of 'business' and the decisions of the patients can be compared to those made by managers and experts. As a patient confronted with a new situation of illness or rehabilitation, we need both analytical processes in the areas where we are not experts and medical and management experts on the other side. People get the chance to invest time and effort in education and training, to be the experts we can really trust. Implicit motivation seems to be a powerful driver in the decision-making process in every situation. Patients need both motivation for their therapies, and rehabilitation and motivation to return to work.

11.1 Introduction

The number of chronically ill patients in high-income countries rises dramatically. Therefore, social insurance organizations have started to invest in promising, but costly, return to work coordination programs. The benefit remains uncertain (Schandelmaier et al., 2012). Based on weak evidence, early rehabilitations seem to reduce absenteeism and disability pensions (Kuoppala & Lamminaeae, 2008). The basic idea of rehabilitation is an integrated intervention to give people with chronical impairments the chance to live a self-determined life. An important aspect of this process is the rehabilitation psychology (Wolf-Kühn & Morfeld, 2016). What makes people tick, what is the reason people go to their daily work, what is the reason for managers and workers to do overtime (Scheffer, 2009)? Motivation seems to be an important driver in our industrialized world. Yet, if a manager or worker becomes a patient in a hospital or goes through vocational rehabilitation, the discussion about motivation ends relatively fast. In some cases, questioners try to analyse the feelings, concerns and motivation of the patients, yet qualitative research does not play a significant role (Wolf-Kühn & Morfeld, 2016). In the role of a patient, every person should operate in the best possible interests, and should learn to make the right medical decisions for their future life. Weeks before, this person may have been an expert in decision-making, but in the context of his or her work environment. In critical situations, this expert knows what to do. As a patient, this person is just a layman with a huge overload of data, information and therapies. Hence, a person is confronted with important decisions but possesses no expert knowledge. Nevertheless, this person has still the same intuition, the same implicit program and still needs motivation.

11.2 Theoretical Background

Gigerenzer undertook critical research on the decision-making of patients in medical situations. In his paper about the 'not responsible patient' he analyses the decision-making process of patients, physicians and medical professionals. The question is if patients are

able to handle all this incoming information about their new physical situation. A physician explained that most patients are not interested in information. The biggest part is psychology. The patients are afraid and they fear the worst. They just want peace of mind and they are not interested in statistics (Gigerenzer, 2001).

Intuition and Feelings

As patients seemingly have limited interest in figures and facts, intuition seems to be an important factor in medical decision-making. In economic and organizational science, intuition still has a long history. It seems to represent access to divine or inborn knowledge. Many Buddhists considered intuition as a gateway to a wider and richer world. Others maintain that intuition is the mystical avenue to knowledge. Researchers in the areas of management and psychology have explained intuition using a wide range of phenomena including heuristic, expertise and nonconscious information processing (Dane & Pratt, 2007). Intuitions are rapid, parallel; affectively charged, holistic judgements obtained without the apparent intrusion of rational thought (Kuhl, 2010; Leybourne & Sadler-Smith, 2006). Intuition has evolved abilities to use the brain, applying rules of thumb providing the possibility to act fast and with amazing precision. Intuition achieves quality by making use of the intelligence of the unconscious by the ability to realize in which situation we should use the right rules without cognition (Batchelor & Burch, 2013). It seems that intuitions are more effective than sophisticated thinking and computer strategies. Nevertheless, intuition can set us on the wrong track (Gigerenzer, 2007). For a long time intuition has been seen as involving a form of information processing that differs from rational, or analytical, processes. Distinctions between 'rational' and 'non-rational' human thought can be traced back as far as Aristotle (Sloman, 1996). Sometimes the terms rational or logical are applied to decision-making that is consciously analytic. The term non-rational is assigned to decision-making that is intuitive and judgmental. The term non-rational refers to decision-making and behaviour that responds to emotions or deviates from action chosen rationally, representing the non-rational and the non-rational components of decision-making and behaviour (Simon, 1987; Newell et al., 1958). Intuitions are affectively charged judgments that arise from rapid, non-conscious, and holistic associations. The holistic, associative properties of intuition involve recognizing patterns or other linkages among disparate stimuli (Dane & Pratt, 2007). Analysis involves sustained, systematic thought over a substantial period of time, while intuition reflects timely, and seemingly less deliberate, reasoning. Sometimes it is referred to as a sense or professional judgement. Having been on the job for a long time, an employee starts to understand that the daily problems are not new and independent from each other. He or she knows how to ignore the irrelevant patterns of activity and to concentrate on the critical ones. Eventually, one begins to cluster the relevant patterns and to link them with other clustered 'pieces'. Collectively, this rich file of pieces generates an extensive data base of knowledge. To be an expert is always a mixture of analysis and intuition. In chess, a grand master must be able to recognise and recall roughly 50.000 chunks. This effort needs more than 10.000 h of chess. Intuition grows from experience. When faced with an arrangement of pieces on a chessboard,

chess masters almost immediately recall both the patterns of the chess pieces and the appropriate strategic moves for the actual situation. Consequently, grandmasters in speed chess competitions can play a number of games simultaneously, even though they may only have a few seconds to make each move (Prietula & Simon, 1989).

Therefore, fast decision makers use more, rather than less, information compared to slow decision makers. They also develop more, not fewer, options, and use a two-tiered advice process. Fast decision-making based on this pattern of behaviours leads to superior performance (Eisenhardt, 1989). In the literature of this area scholars have failed to agree on what intuition is and what it does. This conceptual confusion derives partly from the numerous perspectives applied to understand intuition. One confusing aspect of past research is the tendency to call both the intuitive processes, and the associated products, or outcomes, 'intuition'. Having both academic and non-academic significance, 'intuition,' perhaps not surprisingly, has a wide range of terms associated with it, including gut feelings, sense, and mystical insights. Intuition has nothing to do with magic. Intuition is more or less recognition. In his incomprehension about the mythologized meanings about expert intuition Simon (1987) stated, that we are not at all surprised by a two-year-old child discovering a dog and saying "bow-wow", the effect is just the same. The situation cues a stimulus as an entry to the information stored in the cognition. The result is the answer the expert gets from his brain (Kahneman, 2011). Dane and Pratt (2007) define intuitions as 'affectively charged judgments that arise through rapid, non-conscious, and holistic associations'. In doing so, they delineate intuition from other decision-making approaches like insight or rational decision-making. Intuition draws on our inborn ability to synthesise information quickly and effectively—an ability that may be hindered by more formalized procedures. They believe that intuition is marked by a unique process and outcome; however, they also believe that it is important to disentangle the two, in order to avoid the confusion of the past when researchers often mixed the intuitive process and the associated products or outcomes (Dane & Pratt, 2007). As early as in the 1970s, in the article 'Intuition: An Ignored Dimension of Management', Thomas Isaack (1978) highlighted that there is a lack of attention. From his point of view, it would be important to encourage more interest in the subject of intuition and management (Isaack, 1978). Agor demonstrates how managers use intuitions for strategic decisions (Agor, 1986). Executives often make crucial decisions by relying on their keen intuitive skills, also known as their 'gut' (Hayashi, 2001). Research suggests that intuition may be integral to successfully completing tasks that involve high complexity and short time horizons, such as corporate planning, stock analysis, and performance appraisal (Dane & Pratt, 2007). Our mind constantly receives and processes information that we are not consciously aware of. That is why emotions and feelings might not only be important for our intuitive ability to make good decisions, but may actually be essential. Therefore, Hayashi frames several high-profile executive-level decisions as intuitive or 'gut' decisions (Hayashi, 2001). As there is a need for a fast action, traditionally conceptualized as an exogenous feature of the surrounding, managers usually want to act fast to achieve competitive advantages. Yet it remains unclear how the focus on speed actually affects the

organisation and improves performance. The mere existence of a magazine called *Fast Company* highlights the widespread acceptance of the need for speed. A 19-month ethnographic study revealed that an organization can generate the need for speed by its own emphasis of speed in the past (Perlow et al., 2002). As a consequence, there has been pressure to understand how to make high quality decisions in a short time (Eisenhardt, 1989). Research on time pressure in negotiation has considered that strategic choice largely ignored information processing (De Dreu, 2003). Common to the heuristic and to the expert decision-making perspectives is the idea that individuals non-consciously make holistic associative connections between the stimuli they encounter and their underlying cognitive structures in the process of intuiting (Dane & Pratt, 2007).

In an experiment with golf players the success of beginners and experienced golf professionals was examined under two conditions. The first group had only three seconds for every putt. The players of the second group could take all the time they wanted. The beginners played worse under time pressure. But, surprisingly, the professionals played more efficiently under time pressure than without. In a second experiment the golfers should take care on their drive or count tones as a diversion. Concentrating on the drive, the beginners achieved better results; in contrast, the professionals achieved worse results (Gigerenzer, 2007). With regard to the domain of independence, the relative lack of domain sensitivity diminishes the effectiveness of intuitive decision-making when simple 'rules of thumb' are indiscriminately applied to an inappropriate large number of problem domains (Dane & Pratt, 2007). In a study conducted in Stockholm, portfolio managers, analysts, brokers, and investment bankers would have to forecast the value index of twenty stocks. Every test person had to predict the performance of the stocks based on the names of the companies. The same experiment was conducted with a group of laymen. With the laymen 50 per cent of the forecasts were right indicating that their forecasts were on a random level. Yet just 40 per cent of the professionals come to the right decision (Gigerenzer, 2007). It is often discussed that heuristics and other cognitive frameworks are likely to lead to inaccurate intuitive judgments because they tend to be 'simple' and, thus, may be inadequate to process complex environmental stimuli. This argument mirrors the bulk of research on the shortcomings of heuristics and stereotypes (Dane & Pratt, 2007). In general, it is assumed we need as much information as possible and a high-performance computer to make a reliable forecast. A complex situation needs a complex procedure. Actually, in difficult situations the contrary is true (Gigerenzer, 2007). As Shapiro and Spence (1997) further note, intuition is often more effective in enabling individuals to develop an understanding of the structure of a complex system. For this reason, intuitive judgments are regarded to be more effective than rational analysis whenever a problem becomes increasingly unstructured (Dane & Pratt, 2007). The process of intuition is related to the domain of the 'non-conscious' information processing system. Intuition is a non-conscious process, involving holistic associations, that are produced rapidly, which result in affectively charged judgments. One of the defining characteristics of intuitive processing is that it is non-conscious—it occurs outside of conscious thought. Other determinants of application, such as cultural factors, may also

play a role in the use intuition. For example, cultures with a low emphasis on uncertainty avoidance are willing to take unknown risks and are comfortable with ambiguity and chaos. Because intuitive judgments are, by their very nature, difficult to justify rationally and often involve unknown levels of risk. Cultures with a low degree in uncertainty avoidance may be more inclined to favour intuitive judgments in decision-making than other cultures. The masculine versus feminine cultural distinction (Hofstede, 2013) may also account for differences in the use of intuition across cultures (Dane & Pratt, 2007).

During an award ceremony in Munich the former president of Russia, Michail Gorbatschow, spoke about the 'Berlin Speech' of the former President of the United States Ronald Reagan: 'Mister Gorbatschow tear down this wall'. Gorbatschow stated that to agree to German reunification due to rational arguments would have not been the best idea. Nevertheless, by intuition, he was convinced that the Germans were not aggressive any longer. In addition, he remembered a young soldier who stayed in his house during WW II (Gorbatschow, 2011). Guided by his intuition Gorbatschow agreed to the German reunification.

In medical situations, this highly emotional situation seems to be underestimated, as the subjective assessment of the patients often is not based on medical findings and cannot be explained with scientific theories. Yet it seems that these subjective evaluations are important drivers for the success of medical treatments. These assumptions have an impact on the compliance, the vocational rehabilitation and reintegration to work. This feeling concerning the state of health does not match with the objective indicators, nevertheless they are important information which can't be analysed by clinical observations. As result these feelings have an impact on the mortality rate of patients (Faller & Lang, 2016).

Decision-Making and the Human Brain

Writ large in the literature on decision-making is the idea of the homo economicus, a person with inexhaustible resources and capacities. Many models of rationality see the human mind as a space of unlimited time and knowledge (Gigerenzer & Goldstein, 1996).

If you look at economics textbooks, you will learn that homo economicus can think like Albert Einstein, store as much memory as IBM's Big Blue, and exercise the willpower of Mahatma Gandhi. (Thaler & Sunnstein, 2009, p. 7)

A key problem of the rational assumption is that people are entirely self-interested (Henrich et al., 2011). Due to the philosophic idea of the so-called homo economicus, modern economic theory ignores the influence of emotions assuming that human decision-making is based on rational maximization. The homo economicus is the prototype of a human being who is acting solely based on rationality and which is merely driven by economic motives. Based on this theory, people are just looking for the best possible satisfaction of needs and solely focused on maximization (Laux et al., 2012; Samuelson & Nordhaus, 1987; Preiser, 1990; Mueller, 2012; Deelmann, 2013). Yet the human brain is not equipped with unlimited knowledge; time, and processing power is not unlimited

(Bechara & Damasio, 2004). High numeracy levels are associated with better abilities in judgement (Hanoch et al., 2010).

Nevertheless, researchers have shown that even physicians and health care professionals have difficulties in interpreting and communicating statistical information. Medical doctors perform even worse if the choice of medical treatments is larger. This highlights the role of numerical risk evaluation in health-related and in financial decisions as well (Hanoch et al., 2010; Miron-Shatz et al., 2009).

In the history of the decision-making process theory, there have been three key explanations on human beings' decisions:

- The first was the neoclassical stage (Glimcher et al., 2009). Adam Smith (1723–1790) described a number of phenomena for understanding choice behaviour. These phenomena were more or less ad hoc rules explaining how environmental variables influenced the behaviour. Authors like Samuelson (1915–2009) presented simple mathematical assumptions of binary choices, revealing stable preferences.
- The second stage was the cognitive neuroscience stage. In the late 1980s, scientists started to study the brain of monkeys and examined how they made decisions. The experiments revealed that the firing rates of single neurons were directly connected to the stochastic choice produced by the animals in response to noisy sensory signals. This was a landmark in neuroscience; because it provided the first clear proof of a correlation between the neuronal activity and the stochastic choice (Glimcher et al., 2009).
- The third stage emerged from the new field of neuroeconomics. The goal was to describe the neurobiological 'hardware' that supported choice behaviour in situations ranging from perceptual decision-making to the expression of more complicated preferences (Glimcher et al., 2009; Camerer et al., 2004). The experiments showed that people are not just an accumulation of brain components. Our brain capacities are not endless because the human brain is basically very old and we use a lot of old mechanisms to solve new situations. The actual situation is that our brain has to deal with new problems by using a very old 'hardware'.

A recent study with 300 interviews of managers in Germany reveals non-rational effects in the business to business decision-making. 77 percent of the interviewed persons in the study stated that they push emotions to the back of their mind in the business decision-making process. Amazingly, 54 percent expressed they would cancel a deal despite positive facts if they were to have 'negative feelings' (Otto, 2011). New findings in brain research draw a new picture of mankind. Insights show that the biggest part of our cognition is implicit (Freud, 1930; Gigerenzer, 2007; Kahneman, 2011; Chlupsa et al., 2013; Bargh, 2013; Snyder, 2013). Our implicit memory acts as the 'pilot' for our daily life and our conscious mind just covers a small part of our decision-making process. Based on research, this effect is not just a phenomenon of a shopping tour in the supermarket. Even the choice of our partner seems to be made by our unconscious mind (Gigerenzer, 2007; Deppe et al., 2007). An exciting point is, if our unconscious mind is such an

important driver in our cognition then what about the idea of rational decision-making? If more than 95 percent of our decisions are implicit (Roth, 2013), what does this mean for the seemingly rational decisions? It seems that our unconscious mind has an important and underestimated role in our decision-making process. It is therefore important to find a way to use new academic insights to understand what our implicit memory is interested in and how to communicate appropriately with our unconscious mind. Even Sigmund Freund (1900) posits that the implicit circle is the bigger one covering the smaller conscious circle (Freud, 1900; Spitzer & Wulf, 2010). As Fig. 11.1 visualizes, the biggest part of our cognition is implicit. Recent research reveals that the intuitive system in our brain is more powerful than we believe it is. Some argue that it is initiating most decisions we make (Snyder, 2013).

Kahneman (2011) established two different systems of thinking. The "automatic system" (system 1) which works automatically, quickly, effortlessly and without a deliberate control, and the "deliberate system" (system 2) which works on demand, slowly and under consistent control. In the idea of the two-system-approach, the terms implicit or unconscious are used for system 1. The terms explicit or conscious are used for system 2 and the respective connected brain and memory effects. In fact, the terminology of system 1 and system 2 points back via Stanovich and Richard (Kahneman, 2011) to Freud. Following Freud, everything in our internal perception is virtual and not accessible for

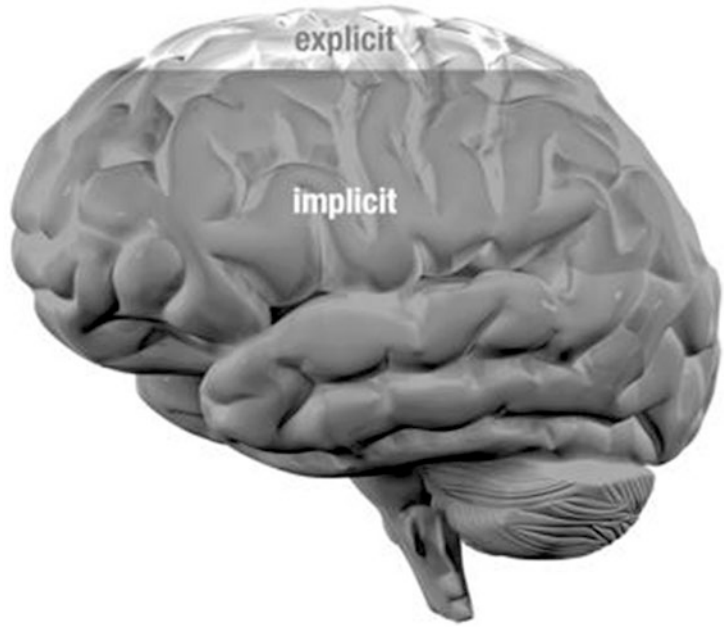

Fig. 11.1 Explicit Versus Implicit Cognition (*Source* Chlupsa 2014, based on Kahneman 2011)

our cognition. The implicit system works in a similar way to a lens in a telescope, which creates a picture of the scenery (Freud, 1900).

Different Levels of Motives

First of all, it has to be stated that motives are merely constructs. There is nothing to show or to touch in the form of physical objects. Motive structures are useful concepts to understand which conditions cause positive emotions and drive people to pursue their goals. There are various concepts covering different numbers of motives. Reiss offers a structure of 16 motives; whereas Kuhl and Scheffer provide a four-motive approach. For this research, the approach of Murray and McClelland which identifies three motives (affiliation, power and achievement)—most researched as 'the big three" (Kehr, 2004; McClelland, 1987)—will be applied (Reiss, 2009; Kuhl, 2010; Scheffer, 2009). Motives reflect the willingness to react to classified conditions with a typical effect pattern. As humans have particular motives in common with other kinds of primates, it has been argued that motives are biologically based but subsequently modified by life experience (Langens et al., 2005). Therefore, it seems appropriate to analyse explicit and implicit motives separately. After contrasting explicit and implicit motives, it is useful to review the distinction between 'implicit motives' versus 'emotions', and 'emotions' versus 'feelings', to create a greater level of understanding. A clear distinction has already been made and accepted between explicit and implicit motives. Following Meffert (2012), implicit motives can be differentiated from explicit motives because the impact of the implicit motives is not detectable by the people (Meffert et al., 2012). This is an obvious contradiction to the fundamental idea of this research.

Motives focus on potential stimuli in a particular situation. Perception blinds out parts of our neutral and open environment creating a scenario exactly designed for our needs. The most dominant motive generates a selective information process directed by the goal of the motive. As a result, an information process is started which automatically gathers information focused on the activities necessary to achieve the target (Langens et al., 2005; Amicia et al., 2013). The dual system approach of explicit and implicit motives is a central proposition in motivation theories. Spangler's (1992) meta-analysis indicates that explicit and implicit motives are empirically uncorrelated (Spangler, 1992). It seems to indicate that explicit and implicit motives are independent concepts (Kehr, 2004; Scheier, 2007). Explicit motivation is consciously representing external goals. In contrast, implicit motivation is outlined as intuition. In the metaphor of David Berlew implicit motives 'push', whereas explicit motives 'pull' the individual (Kehr, 2004; McClelland et al., 1989). Present findings confirm the theoretical models which distinguish two independent behaviour-guiding-systems. The first one is an automatic, non-verbal, hedonically oriented implicit motivation system; whereas the second one is effortful, language-based, socially orientated and explicitly focused on targets (Schultheiss et al., 2008; Scheier, 2007). The interest of this research is to detect the impacts of the unconscious implicit motives for the decision-making process.

Explicit Motives

Explicit motives are connected to the speech-based self-concept of an individual. They are located in the evolutionary younger parts of the brain. Explicit motives provide conscious and focussed attention (Heckhausen & Heckhausen, 2010; Scheffer, 2009). Explicit motives are the reason why hard working people consider themselves individuals striving for achievement (McClelland, 1987; McClelland et al., 1989). Motives of this kind are conscious and can be detected by self-ascription questionnaires (Kehr, 2004). The motivational needs and values that people claim and attribute in questionnaires or to themselves are stable language based beliefs about themselves (Brunstein, 2010; Schultheiss & Strasser, 2011). Explicit motives are strongly influenced by social demands and normative pressures. Particularly, explicit motives influence cognitive choices, e.g. which task to work on. Thus, the explicit motives are closely related to goal attainment (Kehr, 2004). As explicit motives are linked to conscious goals and expectations, individuals with a strong explicit need for achievement have a conscious desire to improve. More generally, explicit motives respond to social-extrinsic incentives (Langens, 2011). Explicit motivation responds most to verbal incentives such as suggestions and praise (Schultheiss & Strasser, 2011). An incongruence of explicit and implicit motives could be associated with impaired emotional well-being (Brunstein, 2010; Langens & McClelland, 1997; Heckhausen & Heckhausen, 2010). Motives are the driving force for what we do. Emotions are the result of the fulfilment or non-fulfilment of motive dispositions (Scheier & Held, 2006).

Implicit Motives

The word implicit,—with the origin of ‘covered’ or ‘wrapped’—derived from the Latin word ‘implicere’, tries to explain what basically is not visible (Kuhl, 2010). The concept of implicit motives was independently developed by different researchers. The most important researchers on this topic are McClelland, Panksepp with his work on affective neuroscience, and Bischof with his approach of the ‘Zurcher Model of Social Motivation’ (Bischof, 1985, 1993; Bischof & Bischof-Koehler, 2011, 2012; Kuhl, 2010; Panksepp, 1998; Scheier & Held, 2006).

New research on implicit effects deals with non-reflected processes in the brain, which determine human behaviour. In contrast to the traditional understanding of implicit processes, instincts are not the main interest. The area of interest covers cognition, memory and decision-making (Scheier & Held, 2006).

A useful concept is the model of the implicit motives. In general, a motive is a driving force selecting direct cognition and indirect behaviour. A motive is orientating and energising (McClelland, 1987). A lot of research reveals that self-assessment does not match with the implicit motive categories. Explicit and implicit motives are independent constructs (Scheffer, 2009). Implicit motives are neither speech-based nor connected to the self-concepts of an individual. Located in the evolutionary older parts of the brain they have an affective core (McClelland, 1987; Scheffer, 2009). The very nature of implicit motives is to work beyond the level of consciousness (Langens, 2009; Dilling & Reimer,

1995). There are many implicit effects that can be detected in human behaviour and in the decision-making processes. By addressing the appropriate implicit motives of an individual, the selective and unconscious cognition can be used in the communication process to achieve intended results (Chlupsa, 2009; Chlupsa & Mueller, 2013).

What drives people is not always presented in a conscious self-concept. Sometimes the reasons for our actions are difficult to explain. This may well be caused by the fact that the most important motives are implicit and stored in a non-verbal format. Implicit motives are neither speech-based nor connected to the self-concepts of an individual. They are located in the evolutionary older parts of the brain and have an affective core. They are presented in a picture-based episodical format and go back to the pre-linguistical stage of childhood (McClelland, 1987; McClelland & Pilon, 1983; Kehr, 2004; Scheffer, 2005; Roth, 2007). The implicit motivational system is derived from affective experience. It is assumed that implicit motives represent the first motivational system shaped in human beings (Hofer & Chasiotis, 2011). This is why implicit motives generally sustain spontaneous behaviour and are derived from the pleasure of the activity itself (McClelland et al., 1989). A person's personality is based on the disposition of motives and the deducted needs (Meffert et al., 2012). Motives are useful to resist the upcoming feeling of unwillingness (Freud, 1927). Implicit motives have a complex structure and interact with different systems of the personality. Piaget and Inhelder (1973) describe implicit cognition as 'wide knowledge', which implies adaptive reactions, which are in turn based on sensomotoric programs. Sensomotoric programs are the interplay between sensorical and motorical processes. The results are automatic response actions (Luhmann, 2009; Laube, 2009). An important aspect of the sensomotoric procedures is that most parts are unconscious. From actual research, we know that there is an episodic memory with a holistic representation of events, feelings and actions in a specific situation (Kuhl, 2001, 2010; Scheffer, 2005). This is the reason why implicit motives emerge more energetically the more they are the object of frustration in childhood (Heckhausen & Heckhausen, 2010; Kuhl, 2005). Another explanation for implicit motives is based on evolutionary psychology. In an evolutionary context, life in small groups was an important long-term issue. The group life was characterised by a collectivist and interdependent orientation. As motives are to satisfy personal needs in an interdependent environment, it is useful to conceal the real motivation behind a particular action. Frequently, implicit motives are concealed to such a degree that even the acting individual is not aware of their existence (McClelland, 1987; McClelland & Pilon, 1983; Scheffer, 2005). In general, it can be assumed that people do not know their implicit motives. Implicit motives are closely connected to operant behaviour and will flexibly be changed in a given context. Implicit motives such as affiliation, power and achievement generate significant differences in individual behaviour (Scheffer, 2005; Langens & McClelland, 1997; Kuhl et al., 2010; Langens et al., 2005; Kuhl, 2010; Traindl, 2007). Current research reveals a correlation of implicit coded stimuli and the detected implicit motives of test subjects (Kordik, 2011).

Affiliation

The history of the affiliation motive starts with Henry Murray. He referenced in his classifications of 44 organic needs a main motivation of positive tropism toward people and the sub-motive for affiliation (Sokolowski & Heckhausen, 2010). The basis of the affiliation motive is the natural interest in contact with other people. An interesting aspect is to avoid being left alone. Needs such as safety and the feeling of security are important aspects of the affiliation motive (Scheffer, 2005). Sigmund Freud ascribes the need of affiliation with the feeling of helplessness in early childhood (Freud, 1930). Even Bischof reflects the affiliation motive with the early state of childhood (Bischof, 1985; Sokolowski & Heckhausen, 2010). The affiliation motive has two totally contrary components. The two motive components are (1) the hope of affiliation and in contrast (2) the fear of rejection. People with a high interest in affiliation have a positive idea about other people, tend to like people faster, seem to be friendlier than others, they are positive and make social decisions. The hope of affiliation is their guideline for their behaviour. These actions are connected to an array of positive emotions such as, for example, self-consciousness. In contrast, the fear of rejection is dominated by feelings such as overstraining, unpopularity and helplessness. The result is a careful distance in the contact to other people combined with a false interpretation of body signals and rejection (Sokolowski & Heckhausen, 2010; Mehrabian & Ksionzky, 1974). Individuals characterised by the implicit affiliation motive are satisfied by a protective and secure, warm and accepting atmosphere (Alsleben & Kuhl, 2011). The affiliation motive has its relevance for the solidarity in groups, cooperation and team work (Peinl, 2008, 2011; Scheier, 2012). As a result, the affiliation motive is inspired by situations where people can interact and get in contact with other people in order to establish a positive and reciprocal relationship (Langens et al., 2005). An affiliation-motivated individual is interested to get and stay in touch with other people. Crucial dimensions for relationships are sympathy, antipathy and the emotional distance. Emotional distance describes the mutual understanding of people (Scheffer, 2005).

Power

Power means to have access to resources and status positions and the unilateral control of behaviour. The power motive is a central concept of human motivation and refers to the desire to influence the behaviour or the emotions of others (Schmalt & Heckhausen, 2010; Winter, 1973; Ewen, 2012). To be important and to be able to influence people is what power-motivated persons are striving for. Power motivation needs formal or social influence. Negative effects are an aggressive and venturous behaviour (Scheffer, 2005). People with a strong power motive are frequently found in higher levels of hierarchy. They often work as journalists, teachers or professors and are in favour of highly competitive sports. Research has shown that these kinds of people are more likely to read sport and sex magazines, prefer more highly concentrated alcohol and tend to engage in sexual multiple partner activities without strong emotional ties (Hofer et al., 2010). People with a power motive are interested in premium goods and sports cars (Schmalt

& Heckhausen, 2010). Nevertheless, the most important issue is to get control over other people. The reason why power motivated individuals are willing to take a high risk seems to be a problem of hubris (Kuhl, 2010). The power motive is a driver in the field of competition and battle as well as activating the willingness to fight (Peinl, 2008, 2011). The power motive is inspired by situations that provide control of other persons. The goal is to control situations and other people (Langens et al., 2005). Power-motivated individuals have a high interest in progress and strongly prescribe their strategies and visions. They strive for responsibility in management positions. Energy, enforcement, leadership and charisma are characteristic traits of the power people (Scheffer, 2005). Power is the ability to have physical, mental, or emotional impact on other individuals or groups (Stanton & Schultheiss, 2009).

Achievement

Achievement is the most explored motive up to now. Even Murray listed achievement on his list of psychological needs (Brunstein & Heckhausen, 2010). He defined achievement as the ability to solve difficult situations, to accomplish things better or faster, solve problems, obtain a high standard and outpace others in competition. The basis of achievement motivation are activities related to a standard of excellence (Brunstein & Heckhausen, 2010). The achievement motive can be understood as an efficiency motive as well. Basic properties are curiosity and interest. Thus, exploration is a typical dimension of the achievement motive. The standard of excellence is the most crucial issue of achievement motivated individuals (Scheffer, 2005). In general, achievement orientated people are neither sub-challenged nor overstrained. They tend to have a good balance between their basic level of achievement and the level of difficulty of their tasks (Kuhl, 2010). Individuals with an achievement motivation try to avoid failures, flops and blame. They are motivated by performance, success and praise which generates positive feelings (Brunstein & Heckhausen, 2010). The achievement motive evokes a striving for better performance and is inspired by situations requiring an extraordinary standing (Peinl, 2008, 2011). Their goal is to dominate a situation and to succeed as a leader (Langens et al., 2005). Implicitly achievement motivated individuals tend to set standards for everything they do (Alsleben & Kuhl, 2011). They prefer clear structures and frequently appear cold and calculating. In general, achievement motivation follows a high expertise in one or more fields of knowledge or skills. Achievement motivated individuals frequently perform in the role of an expert (Scheffer, 2005). Figure 11.2 visualizes the 'Triumvirate' of the Implicit Motives.

11.3 Method

The methodology is primarily based on a broad literature review and on secondary data. For the analyses, also primary quantitative and qualitative data of current research projects of the authors were used. The publication uses a deductive approach, as implicit

Fig. 11.2 The Triumvirate of the Implicit Motives (Chlupsa 2014, adapted from Scheffer 2005)

effects are based on models and the reactions, and the decision-making process will be observed in correlation with this basic psychological model of the implicit motives.

11.4 Analysis

Even medical doctors underpin the importance of the two-system-approach (Kahneman, 2011). Kahneman's theory of decision-making is based on the interplay between two cognitive processes. Rationality and the comparison of risks and benefits, and intuition based on pattern recognition and mental short-cuts. Under time or other pressure people tend to rely on intuition. The wide variation perception implies a strong role for intuition (Morris, 2016). Nevertheless, sometimes intuition guides us into the wrong direction—even if we trust in frequently used tests and technology, that gives us the feeling of safety. During a check-up in a hospital in Virginia, Susan, a 26-year-old single mother, made a standard HIV testing. She never thought that her test could be positive. However, some weeks later she gets the result "HIV positive"! From this moment on, her colleagues refused to use the same telephone, she lost her job and her future and moved to a residential community for HIV-infected people. In the community, she had unprotected sexual intercourse with other infected residents. "You do not have to protect, if you are still HIV positive" she thought. To protect her little son from the virus she decided not

to kiss him anymore, and he suffered from the unnatural distance to his mother. Months later another physician insists during a medical treatment on a second HIV testing. The result was negative (Gigerenzer, 2001).

What was the reason for the wrong HIV test? Out of 10.000 people, usually one person is HIV positive and this person will be tested right. Out of the 9.999 remaining people, which are HIV negative, just one test will go wrong. That means that out of two people who get the result HIV positive just one person really has the virus. So, the chance that a positive test is wrong, is around 50 percent. Gigerenzer made a research and sent a student undercover to some institutions providing AIDS advice. 13 of 20 AIDS advisors had no idea that a HIV testing could test wrong. The study shows the illusion of security (Gigerenzer, 2001).

Based on the sociological part of a research about organisations it seems to be evident that a profound academic education combined with work experience on an expert level are the most crucial success factors. As a consequence, organisations should not think in a hierarchical dimension concerning the further development of new talents. To increase salary and status on the same level of hierarchy, but on an expert level of knowledge, seems to be more appropriate than the traditional career development in the levels of hierarchy. Instead of more generalists, more experts and specialists are needed (Chlupsa, 2014).

Experts can rely on their expertise if the environment is regular and homogeneous. Enough time and experience is needed to train the intuitive judgements. If experts have about 10.000 h of pattern training we can perhaps rely on their judgement. Identification of connected systems can be understood as templates underpinning the strategic thinking of experts (Chassy, 2013). Yet the validity of an expert judgement is limited to the field in which the expert is active and has gained experience. For all other aspects, direct feedback is important for training in all other aspects in which he is just a layman. A classic example is driving a car. In critical situations, we get a direct feedback if we make the right decision. The anaesthesiologist gets the promptest feedback on their work from all medical doctors. In another survey about patients who died on the intensive care unit researchers compared the diagnoses that medical doctors made shortly before death with the data from the autopsy report. The result was that 40 percent of the clinicians who were completely sure about their diagnosis were wrong (Kahneman, 2011). That means that intuition in decision-making is much more important than assumed.

In this context one question arises: Do physicians make efficient decisions, namely do they maximise their patients utilities? In a study of Trarbach and Vogt (2013) they conduct an experiment using the cold pressor test. They used an experimental study to identify the utility function between pain intensity and pain duration. According to their experiment, patients opt in for less pain intensity and longer pain duration (Trarbach & Vogt, 2013).

This is an interesting finding, because an often-made assumption about the intensity and duration is that patients tend to more invasive therapies to reduce the time of illness as patients focus on the last and most intense experience neglecting its duration

(Fredrickson & Kahneman, 1993; Schlosser et al., 2015). The reason for the patients' perception is a result of the processing of temporal information (Ariely, 1998; Ariely & Loewenstein, 2000; Diener et al., 2001; Fredrickson and Kahneman 1993; Varey and Kahneman 1992; Schlosser et al., 2015). Patients simply tend to forget negative experience over time. In consequence, the last negative experience influences patients' behaviour (Kahneman et al., 1993; Redelmeier & Kahneman, 1996; Redelmeier et al., 2003; Schlosser et al., 2015).

Patients often act based on emotionally charged decisions. Older adults often rely on affective information during comprehension compared to younger adults (Charles & Carstensen, 2010). Emotions influence decision-making directly. According to dual-process models, older adults may rely more than younger adults do on intuitive, affect-based processes rather than on more deliberative processes such as evaluating options (Peters et al., 2007; Morrow & Chin, 2015).

It seems that older adults make as effective health decisions as younger people do (Meyer et al., 2007; Stanley et al., 1984; Tanius et al., 2009). The absence of age differences related to decisions may reflect the role of knowledge about illness and decision options. Different interventions may enable older adults to identify the most relevant information for understanding problems and for evaluating options to respond (Mikels et al., 2010; Reyna, 2011; Morrow & Chin, 2015).

Peters et al. (2007) tested the dual-process models in the context of age-related decision-making. Based on the results, decisions are influenced by both deliberative processes that are effortful, information-intensive, and analytic, the system 2 in the dual-process model of Kahneman and by affective processes that are more intuitive, implicit, and automatic, described as system 1 in Kahneman's model. The process capacities seem to change during the human lifecycle. While the role of deliberative processes in decision-making may decrease, affective processes become more prominent (Charles & Carstensen, 2010).

Often people do not know what they are thinking. If you ask a smoker about the warning labels on a packet of cigarettes, he will nearly always comment that smoking has bad consequences for health and may even cause cancer. He will confess that he really takes the warning on the cigarette package seriously. Nevertheless, through an analysis of the activities in his brain using functional magnetic resonance imaging (fMRI), his brain reveals the truth: What the identical person really thinks is, wherever there is a warning there must be a cigarette and I want it now (Lindstrom, 2008). The ideas in the two fields of economics and neuroscience overlap, especially in the area of decision-making (Bechara & Damasio, 2004).

A study on the vocational rehabilitation examines seven relevant factors which influence the outcome of work resumption. Important aspects are the principals of social welfare, the application of laws, the actors in the rehabilitation, co-operation in rehabilitation, economic factors like the labor market, medical factors and personal factors. Components of the personal factors are the educational background, self-efficacy,

immigration status, sex and age. These are important factors, which influence the chance to return to work, which was less likely when the patient had a reduced internal locus of control or less motivation for work resumption (Chamberlain et al., 2009).

11.5 Results

The new information overflow in the medical field empowers patients and at the same time shifts responsibility to them and contributes to the complexity of self-managing illness and rehabilitation. As a result, patients make many decisions in their navigation through the health-care system (McNutt, 2004; Morrow & Chin, 2015).

They decide to visit a doctor or not, and they decide about diagnostics and treatments. Chronic illness for example requires decisions that may change their complete lifestyle. These health-related decisions made by patients are often complex. They require integration of dynamic and uncertain information from multiple sources (Mitzner et al., 2013; Morrow & Chin, 2015).

Health and rehabilitation becomes a kind of 'business' and the decisions of the patients can be compared to those made by managers and experts in high-complex domains like financial analysts, military generals and pilots, who make decisions under dynamic and uncertain conditions that require an understanding of the problem situation. However, patients may lack the knowledge and experience that promote effective decision-making under such conditions (Morrow & Chin, 2015). So, if we create empowered and responsible instead of anxious patients, we will be able to improve our health care system in a different way (Gigerenzer, 2001).

Still even experts need time and invest many hours in their expert level. A research in the field of business to business decision showed evidence for a limited role of rational decision-making. From the perspective of the homo economicus, clear non-rational drivers were identified. The hypotheses about the interplay of implicit motives and decision-making could be confirmed in personal, management, and group decisions (Chlupsa, 2014).

It seems that patients confronted with a new situation of illness or rehabilitation require both analytical processes in the areas where we are not experts, and medical and social-management experts on the other side. People who get the chance to invest time and effort in education and training becoming those experts we can really trust.

11.6 Conclusion

Finally, it seems essential that the workplace is integrated into rehabilitation (Kuoppala & Lamminpaeae, 2008). Yet a study of Ernst and Young showed that more than 50 percent of the employees in Germany do not trust their companies and bosses. Solely 44

percent trust their companies, just 47 percent trust their management (Grohnert, 2016). Implicit motivation seems to be a powerful driver in the decision-making process in every situation, especially in medical decisions. Patients need both motivation for their therapies and rehabilitation, and motivation to return to work.

References

Agor, W. H. (1986). *The logic of intuitive decision-making: A research-based approach for top management.* New York: Quorum Books.

Alsleben, P., & Kuhl, J. (2011). Touching a person's essence: using implicit motives as personal resources in counseling. In M. W. Cox & K. Eric (Eds.), *Handbook of motivational counseling: Goal-based approach to assessment and intervention with addiction* (pp. 109–129). San Francisco: John Wiley and Sons.

Amicia, F. D., Höfer, P., & Röckenhaus, F. (2013). Die Macht des Unbewussten – Cologne: Phoenix. Broadcast TV, 26 March 2013.

Ariely, D. (1998). Combining experiences over time: the effects of duration, intensity changes and on-line measurements on retrospective pain evaluations. *Journal of Behavioral Decision-Making, 11,* 19–45.

Ariely, D., & Loewenstein, G. (2000). When does duration matter in judgment and decision making? *Journal of Experimental Psychology: General, 129*(4), 508–523.

Bargh, J. (2013). Die Macht des Unbewussten. In F.D. Amicia, P. Höfer, F. Röckenhaus (Eds.), *Die Macht des Unbewussten – Cologne: Phoenix.* Broadcast TV, 26 March 2013.

Batchelor, J. H., & Burch, G. (2013). Increasing intuitive decision-making speed and accuracy by further understanding intuitive decision-making using emotional means. *Developments in Business Simulation and Experiential Learning, 40,* 38–42.

Bechara, A., & Damasio, A. R. (2004). The somatic marker hypothesis: a neural theory of a economic decision. *Games and Economic Behavior, 52,* 336–372.

Bischof, N. (1985). *Das Rätsel Ödipus. Die biologischen Wurzeln des Urkonfliktes von Intimität und Autonomie.* Piper.

Bischof, N. (1993). Untersuchungen zur Systemanalyse der sozialen Motivation I: die Regulation der sozialen Distanz. Von der Feldtheorie zur Systemtheorie. *Zeitschrift für Psychologie, 201,* 5–43.

Bischof, N., & Bischof-Köhler, D. (2012). *Das Zürcher Modell der sozialen Motivation.* http://www.bischof.com/norbert_forschung.html. Accessed 12 Febr 2020.

Bischof-Köhler, D. (2011). *Soziale Entwicklung in Kindheit und Jugend. Bindung, Empathie, Theory of Mind.* Kohlhammer.

Brunstein, J. C. (2010). Implizite und Explizite Motive. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation und Handeln* (pp. 237–253). Berlin: Springer.

Brunstein, J. C., & Heckhausen, H. (2010). Leistungsmotivation. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation und Handeln* (pp. 145–192). Berlin: Springer.

Camerer, C. F., Loewenstein G., & Rabin, M. (2004). *Behavioral economics.* Princeton University Press.

Chamberlain, M. A., Moser, V. F., Schüldt Ekholm, K., O'Connor, R. J., Herceg, M., & Ekholm, J. (2009). Vocational rehabilitation: an educational review. *Journal of Rehabilitation Medicine, 41,* 856–869.

Charles, S.T., & Carstensen, L.L. (2010). Social and emotional aging. *Annual Review of Psychology,* 61, 383–409.

Chassy, P. (2013). The role of memory templates in experts 'strategic thinking'. *Psychology Research, 3*(5), 276–289.
Chlupsa, C. (2009). Neuromarketing – Neue Chancen für die Werbung. *Forum, 3,* 6.
Chlupsa, C. (2014). *The impact of implicit motives on the business to business decision-making process.* Plymouth Business School (edn.). University of Plymouth.
Chlupsa, C., Döhl, W., Lean, J., & Hanoch, Y. (2013). The impact of implicit motives on the business to business decision-making process. In *NeuroPsychoEconomics Conference Proceedings* (S. 31). Washington: Association for NeuroPsychoEconomics.
Chlupsa, C., & Mueller, K.-M. (2013). Dem Wohlfühlpreis auf der Spur. http://www.absatzwirtschaft.de/dem-wohlfuehlpreis-auf-der-spur-14849. Accessed 12 Febr 2020.
Dane, E., & Pratt, M. G. (2007). Exploring intuition and its role in managerial decision making. *Academy of Management Review, 32*(1), 33–54.
De Dreu, C.K. (2003). *Time pressure and closing of the mind in negotiation*. Elsevier.
Deelmann, T. (2013). *Meilensteine und Trends der Betriebswirtschaft*. Schmidt.
Deppe, M., Schwindt, W., Krämer, J., Kugel, H., Plassmann, H., Kenning, P., et al. (2007). Belege für ein neurales Korrelat des Framing-Effekts: Voreingenommenheitsspezifische Aktivität im ventromedialen präfrontalen Kortex bei Beurteilung von Glaubwürdigkeit. In W. J. Koschnick (Ed.), *Focus-Jahrbuch* (pp. 237–256). München: Focus Magazin Verlag.
Diener, E., Wirtz, D., & Oishi, S. (2001). End effects of rated life quality: The James dean effect. *Psychological Science, 12,* 124–128.
Dilling, H., & Reimer, C. (1995). *Psychiatrie und Psychotherapie.* Springer.
Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal, 32,* 534–576.
Ewen, C. (2012). *When "why" and "how" determine the "what": Power motivation, extraversion, and job performance.* University of Maastricht.
Faller, H., & Lang, H. (2016). *Medizinische Psychologie und Soziologie*. Springer.
Fredrickson, B. L., & Kahneman, D. (1993). Duration neglect in retrospective evaluations of affective episodes. *Journal of Personality and Social Psychology, 65,* 45–55.
Freud, S. (1900). *Die Traumdeutung*. Franz Deuticke.
Freud, S. (1927). Die Zukunft einer Illusion. Internationaler Psychoanalytischer Verlag.
Freud, S. (1930). *Das Unbehagen in der Kultur*. Internationaler Psychoanalytischer Verlag.
Gigerenzer, G. (2001). Der unmündige Patient. In K. M. Michel, I. Karsunke, & T. Spengler (Eds.), *Der laufende Schwachsinn*. Berlin: Rowohlt.
Gigerenzer, G. (2007). *Bauchentscheidung – Die Intelligenz des Unbewussten und die Macht der Intuition*. Bertelsmann.
Gigerenzer, G., & Goldstein, D. G. (1996). Mind as computer: birth of metaphor. *Creativity Research Journal, 9(2 and 3),* 131–144.
Glimcher, P. W., Camerer, C. F., Fehr, E., & Poldrack, R. A. (2009). *Neuroeconomics*. Elsevier.
Gorbatschow, M. (2011). Franz Josef Strauß Award 2011 [Personal records of the acceptance speech of Dr. h.c. Michail Gorbatschow at Munich on the occasion of the Franz Josef Strauß Award 2011 at 10 December 2011 at Munich.
Grohnert, A. (2016). Studie unter Beschäftigten – nur eine Minderheit vertraut der Firma. Interview. Ntv.de. http://www.n-tv.de/wirtschaft/Nur-eine-Minderheit-vertraut-der-Firma-article18773561.html. Accessed 12 Feb 2020.
Hanoch, Y., Miron-Shatz, T., Cole, H., & Himmelstein, M. (2010). Choice, numeracy, and physicians-in-training performance: the case of medicare part D. *Health Psychology, 29*(4), 454–459.
Hayashi, A. M. (2001). When to trust your gut. *Harvard Business Review, R0102C,* 5–11.
Heckhausen, J., & Heckhausen, H. (2010). *Motivation und Handeln.* Springer.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., et al. (2011). In: search of homo economicus: behavioral experiments in 15 small-scale societies. *Economics and Social Behavior,* 91(2), 73–78.

Hofer, J., Busch, H., Bond, M. H., Campos, D., Li, M., & Law, R. (2010). The implicit power motive and sociosexuality in men and women: Pancultural effects of responsibility. *Journal of Personality and SocialPsychology, 99,* 380–394.

Hofer, J., & Chasiotis, A. (2011). Implicit motives across cultures. *Online Readings in Psychology and Culture, 4,* 1–10.

Hofstede, G. (2013). *Interkulturelle Zusammenarbeit: Kulturen—Organisationen—Management*. Springer.

Isaack, T. A. (1978). Intuition: an ignored dimension of management. *Academy of Management Review, 3,* 917–922.

Kahneman, D., Fredrickson, B. L., Schreiber, C. A., & Redelmeier, D. A. (1993). When more pain is preferred to less: adding a better end. *Psychological Science, 4,* 401–405.

Kahneman, D. (2011). *Schnelles Denken, langsames Denken*. Siedler.

Kehr, H. M. (2004). Integrating implicit motives, explicit motives, and perceived abilities: the compensatory model of work motivation and volition. *Academy of Management Review, 29*(3), 479–499.

Kordik, A. (2011). *Implicit motives and affect: facial EMG as an indicator of dispositional differences.* Friedrich-Alexander-Universität.

Kuhl, J. (2001). *Motivation und Persönlichkeit Interaktion psychischer Systeme.* Hogrefe.

Kuhl, J. (2005). Vorwort der Herausgeber. In D. Scheffer (Ed.), *Implizite Motive*. Göttingen: Hogrefe.

Kuhl, J. (2010). *Lehrbuch der Persönlichkeitspsychologie – Motivation, Emotion und Selbststeuerung*. Hogrefe.

Kuhl, J., Scheffer, D., Mikoleit, B., & Strehlau, A. (2010). *Persönlichkeit und Motivation im Unternehmen*. Kohlhammer.

Kuoppala, J., & Lamminapää, A. (2008). Rehabilitation and work ability: a systematic literature review. *Journal of Rehabilitation Medicine, 40*(10), 796–804.

Langens, T. A., Schmalt, H.-D., & Sokolowski, K. (2005). *Motivmessung: Grundlagen und Anwendung.* Universität Siegen.

Langens, T. A. (2009). Leistung. In V. Brandstätter & J. H. Otto (Eds.), *Handbuch der Allgemeinen Psychologie – Motivation und Emotion* (pp. 217–224). Göttingen: Hogrefe.

Langens, T.A. (2011). *Congruence between implicit and explicit motives and emotional well-being: The moderating role of activity inhibition.* Bergische Universität Wuppertal.

Langens, T. A., & McClelland, D. C. (1997). *Implicit motives, explicit motives, and emotional well-being.* In 105th Annual Convention of the American Psychological Association.

Laube, W. (2009). *Sensomotorisches System*. Thieme.

Laux, H., Gillenkirch, R. M., & Schenk-Mathes H. Y. (2012). *Entscheidungstheorien*. Springer.

Leybourne, S., & Sadler-Smith, E. (2006). The role of intuition and improvisation in project management. *International Journal of Project Management, 24,* 483–492.

Lindstrom, M. (2008). *Buy-ology*. Random House.

Luhmann, H. (2009). Sensomotorische Systeme: Körperhaltung und Bewegung. In R. Klinke (Ed.), *Lehrbuch Physiologie* (pp. 757–798). New York: Thieme.

McClelland, D. C. (1987). *Human motivation*. Cambridge University Press.

McClelland, D. C., & Pilon, D. A. (1983). Sources of adult motives in pattern of parent behaviour in early childhood. *Journal of Personality and Social Psychology, 44,* 564–574.

McClelland, D. C., Koestner, R., & Weinberger, J. (1989). How do self-attributed and implicit motives differ? *Psychological Review, 96,* 690–702.

McNutt, R. A. (2004). Shared medical decision-making: problems, process, progress. *Journal of the American Medical Association, 292,* 2516–2518.
Meffert, H., Burmann, C., & Kirchgeorg, M. (2012). *Marketing*. Springer Gabler.
Mehrabian, A., & Ksionzky, S. (1974). *A theory of affiliation*. Lexington.
Meyer, B. J. F., Talbot, A. P., & Ranalli, C. (2007). Why older adults make more immediate treatment decisions about cancer than younger adults. *Psychology and Aging, 22,* 505–524.
Mikels, J. A., Löckenhoff, C. E., Maglio, S. J., Goldstein, M. K., Garber, A., & Carstensen, L. L. (2010). Following your heart or your head: focusing on emotions versus information differentially influences the decisions of younger and older adults. *Journal of Experimental Psychology: Applied, 16*(1), 87–95.
Miron-Shatz, T., Hanoch, Y., Graef, D., & Sagi, M. (2009). Presentation format affects comprehension and risk assessment: the case of prenatal screening. *Journal of Health Communications, 14,* 439–450.
Mitzner, T. L., Barg-Walkow, H., McBride, S. E., & Rogers, W. (2013). Self-management of wellness and illness in an aging population. *Reviews of Human Factors and Ergonomics, 8,* 277–333.
Morris, A. (2016). Rational vs. intuitive judgement in surgical decision-making. *Annals of Surgery,* 264(6), 887–888.
Morrow, D., & Chin, J. (2015). Decision-making and health literacy among older adults. Aging and decision-making. In T. M. Hess, J. N. Strough, & C. E. Loeckenhoff (Eds.), *Aging and decision-making – empirical and applied perspectives* (pp. 261–282). London: Elsevier.
Mueller, K.-M. (2012). *NeuroPricing.* Haufe.
Newell, A., Shaw, J. C., & Simon, H. A. (1958). Elements of a theory of human problem solving. *Psychological Review, 65,* 151–166.
Otto, R. (2011). Kopf oder Bauch. *Indukom, 1,* 36–41.
Panksepp, J. (1998). *Affective neuroscience – The foundations of human and animal emotions*. Oxford University Press.
Peinl, R. (2008). *Multiagentsimulation der Wissensweitergabe in Organisationen am Beispiel von Individualsoftwareherstellern*. Martin-Luther-Universität.
Peinl, R. (2011). *Wissensmanagement. Wissensmangement, Lernen und Gedächtnis*. Hochschule Hof.
Perlow, L. A., Okhuysen, G. A., & Repenning, N. P. (2002). The speed trap: exploring the relationship between decision-making and temporal context. *Academy of Management Journal, 45,* 931–955.
Peters, E., Hess, T. M., Västfjäll, D., & Auman, C. (2007). Adult age differences in dual information processes and their influence on judgments and decisions: a review. *Perspectives on Psychological Science, 2,* 1–23.
Piaget, J., & Inhelder, B. (1973). *Die Entwicklung der elementaren logischen Strukturen*. Pädagogischer Verlag Schwann.
Preiser, E. (1990). *Nationalökonomie heute*. C.H. Beck.
Prietula, M. J., & Simon, H.A. (1989). The experts in your midst. *Harvard Business Review,* January-February, 120–124.
Redelmeier, D. A., & Kahneman, D. (1996). Patient's memories of painful medical treatments: real-time and retrospective evaluations of two minimally invasive procedures. *Pain, 66,* 3–8.
Redelmeier, D. A., Katz, J., & Kahneman, D. (2003). Memories of colonoscopy: a randomized trial. *Pain, 104,* 187–194.
Reiss, S. (2009). *The normal personality – Das Reiss Profile*. Gabal.
Reyna, V. F. (2011). *Across the life span. Communicating risks and benefits: An evidence-based user's guide*. Federal Drug Administration.

Roth, G. (2007). *Persönlichkeit, Entscheidung und Verhalten*. Klett-Cotta.
Roth, G. (2013). Die Macht des Unbewussten. In F. D. Amicia, P. Höfer, & Röckenhaus, F. (Eds.), *Die Macht des Unbewussten – Cologne: Phoenix*. Broadcast TV, 26 March 2013.
Samuelson, P.A., & Nordhaus, W.D. (1987). *Volkswirtschaftslehre 1.* Bund-Verlag.
Schandelmaier, S., Ebrahim, S., Burkhardt, S. C., de Boer, W. E., Zumbrunn, T., Guyatt, G. H., et al. (2012). Return to work coordination programmes for work disability: a meta-analysis of randomised controlled trials. *PLoS ONE, 7*(11),
Scheffer, D. (2005). *Implizite Motive.* Hogrefe.
Scheffer, D. (2009). Implizite und explizite Motive. In V. Brandstätter & J. H. Otto (Eds.), *Handbuch der Allgemeinen Psychology – Motivation und Emotion* (pp. 29–36). Göttingen: Hogrefe.
Scheier, C. (2007). Marketing und Hirnforschung. In W. J. Koschnick (Ed.), *Focus-Jahrbuch 2007* (pp. 129–144). München: Focus Magazin Verlag.
Scheier, C. (2012). Lass dich Verführen! Warum wir kaufen was wir kaufen. In: N. Graef (Ed.), *Die story, WDR*. Broadcast TV, 30 January 2012.
Scheier, C., & Held, D. (2006). *Wie Werbung wirkt*. Haufe.
Schlosser, D. A., Campellone, T. R., Biagianti, B., Delucchi, K. L., Gard, D. E., Fulford, D., et al. (2015). Modeling the role of negative symptoms in determining social functioning in individuals at clinical high risk of psychosis. *Schizophrenia Research, 169,* 204–208.
Schmalt, H.-D., & Heckhausen, H. (2010). Machtmotivation. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation und Handeln* (pp. 201–236). Berlin: Springer.
Schultheiss, O. C., Jones, N. M., Davis, A. Q., & Kley, C. (2008). The role of implicit motivation in hot and cold goal pursuit: effects on goal progress, goal rumination, and emotional well-being. *Journal of Research in Personality, 42,* 971–978.
Schultheiss, O.C., & Strasser, A. (2011). *Referential processing and competence as determinants of congruence between implicit and explicit motives*. Friedrich- Alexander-Universität.
Shapiro, S., & Spence, M. T. (1997). Managerial intuition: a conceptual and operational framework. *Business Horizons, 40*(1), 63–68.
Simon, H.A. (1987). *Making management decisions: The role of intuition and emotion.* Carnegie Mellon University.
Sloman, S. A. (1996). The empirical case for two system of reasoning. *Psychological Bulletin, 119,* 3–22.
Snyder, A. (2013). Die Macht des Unbewussten. In F. D. Amicia, P. Höfer, & F. Röckenhaus, (Eds.), *Die Macht des Unbewussten – Cologne: Phoenix*. Broadcast TV, 26 March 2013.
Sokolowski, K., & Heckhausen, H. (2010). Soziale Bindung: Anschlussmotivation und Intimitätsmotivation. In J. Heckhausen & H. Heckhausen (Eds.), *Motivation und Handeln* (pp. 193–210). Berlin: Springer.
Spangler, W. D. (1992). Validity of questionnaire and TAT measures of need for achievement: Two meta-analyses. *Psychological Bulletin, 112*(1), 140–154.
Spitzer, M., & Wulf, B. (2010). *Hirnforschung für Neurogierige.* Schattauer.
Stanley, B., Guido, J., Stanley, M., Shortell, D. (1984). The elderly patient and informed consent. *Journal of the American Medical Association,* 252, 1302–1306.
Stanton, J. S., & Schultheiss, O. C. (2009). The hormonal correlates of implicit power motivation. *Journal of Research in Personality,* 43, 942–949.
Tanius, B. E., Wood, S., Hanoch, Y., & Rice, T. (2009). Aging and choice: applications to medicare part D. *Judgment and Decision-making, 4,* 92–101.
Thaler, R. H., & Sunstein, C. R. (2009). Nudge. Penguin.
Traindl, A. (2007). *Neuromarketing: Die innovative Visualisierung von Emotionen*. Trauner Verlag.

Trarbach, J., & Vogt, B. (2013). Does your physician see your needs? An experimental analysis on prioritizing patients. In *NeuroPsychoEconomics Conference Proceedings* (S. 63). Washington: Association for NeuroPsychoEconomics.

Varey, C., & Kahneman, D. (1992). Experiences extended across time: evaluation of moments and episodes. *Journal of Behavioral Decision-Making, 5*(3), 169–185.

Winter, D.G. (1973). *The power motive*. Free Press.

Wolf-Kühn, N., & Morfeld, M. (2016). *Rehabilitationspsychologie*. Springer.

A DIN EN ISO Certification "Healthy Community" Requires Cooperation with the Workplace Health Management

12

Maren Porzelt and Manfred Cassens

Abstract

Across all political departments the "(New) High-Tech Strategy"—implemented by the German government in 2006—should pave the way for industry and science to enable detection and implementation of necessary innovations. At the same time, the working population is already facing massive changes in its working conditions, which has often a negative impact on the employees' state of health. Already in 1999, the World Health Organization (WHO) pointed to a direct connection between the sustained development of a society's economic and social environment and the society's general state of health. A much-discussed aspect concerning environmental health care projects is the latent and subconscious development of local underprovision, misprovision or overprovision. This is often due to the lack of a central coordination facility that assumes the duty of superordinate interaction, planning and—most importantly—sustained and indicatory evaluations. Most health care research experts point out that a sustained improvement in the overall health status in Germany will not be achieved by a mere increase in provided health care, but rather by a more focused, evidence-based distribution of existing health care resource. The German Prevention Act is currently creating the legal and monetary prerequisites so

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that efforts in regional and communal behavioural and circumstantial prevention are in accordance with the "health in all policies"-strategy. These should, from the very start, meet the requirements of a quality-assuring organizational development by a communal health management and should include local stakeholders.

12.1 Introduction

In order to retain the status as one of the leading industrial countries, the German government introduced its "High-Tech Strategy" in 2006, which is inextricably linked with the term "Industry 4.0" (Reimer, 2006). Across all political departments, this strategy should pave the way for industry and science to be able to detect and implement necessary innovations. At the same time, however, the working population is already facing massive changes in its working conditions. In order to maintain high standards, production and service, conditions are getting more complex, requiring employees to exhibit increased flexibility and, in addition, the general skills shortage due to demographic and qualification-related change has a negative/straining effect on the employees' state of health. Therefore, the German Ministry of Health has issued a warning on the possible consequences of technological innovations in the working environment on mental health. Absences related to mental illness lead to considerable financial strains on the German health system as well as on the economy (Bundesministerium für Gesundheit, 2019). According to the 2015 Medical Leave Report, mental illnesses are the fourth most common cause for absence at work in Germany—after musculoskeletal disorders, respiratory diseases and injuries (Badura, 2015). A cause for concern in this context is the 60% increase in absences related to mental illness between 2002 and 2013.

Currently, therefore, there is an urgent need in Germany to create an environment of innovation and productivity that allows the employees to maintain a reasonable work-life balance. Beyond the pure working conditions, a stronger focus on the workforces' individual living, social and environmental conditions is required (Froböse et al., 2011). However, there are grave regional discrepancies regarding internal structures of corporate health management (BGM). A 2013 study in the German state of Thuringia, funded by the EU's European Social Fund, has revealed that only 17% of the enterprises resident there—mostly larger or public companies—have implemented a full-scale BGM (Bühren et al., 2015). In the whole of Germany the BGM implementation rate in medium-sized to large companies amounted to an average of 37% in 2011 (Bechmann et al., 2011). In this context, a stronger focus should be placed on a preventive health care concept. It is therefore important to predetermine potential hazards by evaluating dangers and risks and implementing suitable measures aimed at prevention and health promotion. Not only the "High-Tech Strategy", but also the health strategy should be considered across all political departments.

12.2 Current Health Policy Trends

Since 1973, German employers have been obliged by law to cooperate with qualified experts on employee safety and health (company doctors and other safety experts). A special Occupational Safety and Health Act was introduced in 1996. Since 2004, work reintegration of employees after more than 42 days of absence within one year has been regulated by law.

The Structural Health Care Act (GKV-VStG), passed at the beginning of 2012, lay the foundation stone for a nationwide, needs-based, easy-access care system (Bundesministerium für Gesundheit, 2015). It can be regarded as a bridge-building step towards a multi-sectoral regional health structure. Apart from several other framework parameters, the GKV-VStG serves to promote cooperation and networking efforts of specialized outpatient and stationary facilities as well as to reinforce medical care centres. In addition, it stresses the necessity to revise the current data transparency with the aim of a lasting improvement in terms of care research and the insurance system.

The Prevention Act for Germany, passed in summer 2015, focuses on a cross-sectoral approach in all environments in which humans are living, learning and working. At the same time, it precisely defines the financial and factual/technical responsibilities. This imposes a legal obligation on social security agencies as well as regional states and local authorities, the employment agency and other social partners. This obligation to act fundamentally changes the basic monetary and practice-oriented topics of health promotion and prevention and also makes them a subject of discussion in the general public. This is a landmark for the "health in all policies" idea that has found its way into the Ottawa Charter in 1986. Since then the sustained implementation of this generally welcomed idea has often failed due to a lack of financial feasibility. Municipalities and local communities in particular often lacked the financial resources. Thanks to the legally required increase in inter-professional networking and cooperation of all partners involved, a more active involvement than before is hoped for (Froböse et al., 2011).

12.3 Ottawa Goes Regional

In Europe, the inclusion of health-promoting issues in general policies is strongly connected with the Ottawa Charter of 1986.

12.3.1 Local Governments' Prevention Mandate

Following up on the Charter, the World Health Organization (WHO) in 1999 already pointed to a direct connection between the sustained development of a society's economic and social environment and the society's general state of health. An adequate health policy plays a decisive role in a country's economic capability. Based on this, the

WHO demanded an improved multi-sectoral approach of all institutions involved within a community, a demand that is reflected in the term "health in all polices", introduced in the 1980s. The Ottawa Charter's 38 European Health Objectives that were part of a further specification through the Agenda 21 in 1998 in Geneva, were now to be adapted and implemented at regional levels. A corresponding adaptation guide—known as "Local Agenda 21" (LA 21)—focuses on the local administrations' imminent responsibility as regional coordinators regarding the pursuit of the objectives in accordance with the Charter. Many and various public-health-related offers and interventions have since been inaugurated or expanded in towns, communities and districts. A much discussed problematic aspect in this context, however, is the latent and subconscious development of local underprovision, misprovision or overprovision. This is often due to the lack of a central coordination facility that assumes the duty of superordinate interaction, planning and—most importantly—sustained and indicatory evaluations. Regarding the impending allocation scenario in particular, it becomes evident that it is necessary to implement a structured and inter-sectoral approach within the community setting that on the one hand focuses on the processes, but on the other hand also includes precise outcome measures. This is where the LA 21 demands the involvement of the local government as well as the general public, the NGOs and the economy. Furthermore, the implementation of processes regarding trans-sectoral planning, activities, monitoring and (continued) improvements including the indicators derived from these processes is being discussed (Ruschkowski, 2002).

The requirements of a healthy community are being discussed at various points. To start with, a central contact is necessary where all action, planning and also feedback are being coordinated as well as evaluated. Additionally, all parties involved have to establish cross-sector networks to be able to purposefully implement common objectives. This should minimize the occurrence of underprovision, misprovision or overprovision. Resulting from the two aforementioned points there is the requirement of a transparent evaluation and implementation of a CIP (continual improvement process) by means of the inclusion of all parties involved: agents, users and sponsors (NBCH, 2013; Techniker Krankenkasse, 2008).

12.3.2 Ottawa Charter's Significance in Germany: Challenges and Practical Approaches

Since the 1990s a number of different networks have been set up with the objective to establish a strategic network of health-related care structures to boost the health of regional sections of the population (Braun et al., 2008). To a growing extent, the integration of regional companies came into focus as these companies have a significant influence—not only on their own workforce, but also on the region's infrastructure and the general living conditions.

To which extent these organised health regions gave an important social and economic impetus beyond pure health-related issues can be seen with initiatives like the "Network of German Health Regions" in Northern Germany (Morgner & Eberlein-Gonska, 2011), the "Health Strategies of Baden-Wuerttemberg" in Germany's Southwestern part or the "Health Regions^{plus}" in Bavaria. The all-German "Healthy Cities" network, based on the WHO's "Healthy Cities" concept in accordance with the Ottawa Charter, is also aimed at a multi-sectoral cooperation that includes local science endeavours as well as the local economy (Gesunde Städte Netzwerk 2019). A major point of interest to all parties involved in this context—including the trade unions—is the interlocking of the inner-company health management with external cooperation partners, as for instance being discussed in depth within the "Health Region^{plus}" Ingolstadt (GOIN/SEGESTRA) or in Baden-Wuerttemberg. Andrew Webber, former president and CEO at the USA's "National Business Coalition on Health" (NBCH) once summed up this interlocking as follows:

> This seed-grant program, and NBCH's promotion of metrics for population health, performance measures for health plans, and support of value-based approaches to health and health care, champion the progression of actions by employers…. By striking out in these new directions, employers can better achieve their organizational goals, along with building a healthier, more economically robust America. (Webber, 2011)

It is important in a regional setting, however, to set up a comparatively sustainable and quality-ensuring overall concept in order to guarantee an adequate multi-sectoral use of resources and to provide an evaluation that is in accordance with the Prevention Act by means of a transparent organizational development. The Local Agenda 21 already requires a strongly process-oriented approach when establishing networks of regional health care structures if a sustained quality development is to be ensured. Also of major importance is a scientific evaluation that minutely analyses the effectiveness and efficiency of implemented structures, interventions, and offered activities within the regional setting and uses the gathered information to derive the necessary steps. Some references on first steps towards scientifically founded support and evaluation of various regional interventions can be found. However, there is an inherent lack of standardised, indicator-based measures of effectiveness and efficiency (e.g. comparable with regulations in the field of pharmaceutical or food industry) that can serve as a basis for conclusions regarding further developments.

12.4 Possible Solutions for a "Healthy Community"

For more or less 20 years, mostly thanks to the process-oriented EN ISO body, standards have been successfully set regarding the development of health management.

12.4.1 Demand Assessment of Profound High-Quality Conditions for a "Healthy Community"

In order to implement a sustained, integral and demand-oriented adaptation of the new health approach required by the WHO within a regional setting, the Institute of Health and Social Affairs (ifgs) at FOM University of Applied Sciences in Munich focuses on the development of a communal Health Management System (KGM) in one of its projects. During preliminary talks with representatives of regional health networks that have already passed the first pilot phases of trans-sectoral networking with the focus on prevention and health promotion, the lack of adequate trans-sectoral management structures has been identified as the main problem. Especially in rural regions, which traditionally have presence of generically developed thinking within professional structures, it is imperative to counteract this kind of "silo mentality".

The first steps of in-house research yielded the following basic conditions that are required regarding the field of regional health promotion:

1. Implementing an integral process-oriented and scientifically founded way of thinking and acting when managing regional structures.
2. Establishing a coordination facility within the community with a defined universal quality standard. This facility's objective is the step-by-step synchronization of all institutions that are to be integrated in a modular way by determining universal standard indicators.
3. Systematically analysing and defining clear responsibilities, multi-sectorially unearthing redundancies and determining sustainable and demand-oriented interface cooperations.
4. Specifying generalized indicators on the regional conditions—under the premise of preserving evaluative comparability.
5. Implementing an evidence-based communal quality management system in accordance with the "health in all policies" approach.
6. Adapting a cloud-based software system to the regional requirements in order to resource-efficiently set up a user-friendly interactive handling and analysis system.

To continue meeting the requirement of a "healthy community" in accordance with the health objectives aimed at by the WHO, it is mandatory to include the region's infrastructure within a health-related communal setting (Fig. 12.1).

12.4.2 Project History

In a previous Institute of Health and Social Affairs (ifgs) project that already discussed a quality management within a communal setting, an initial handbook based on the 10

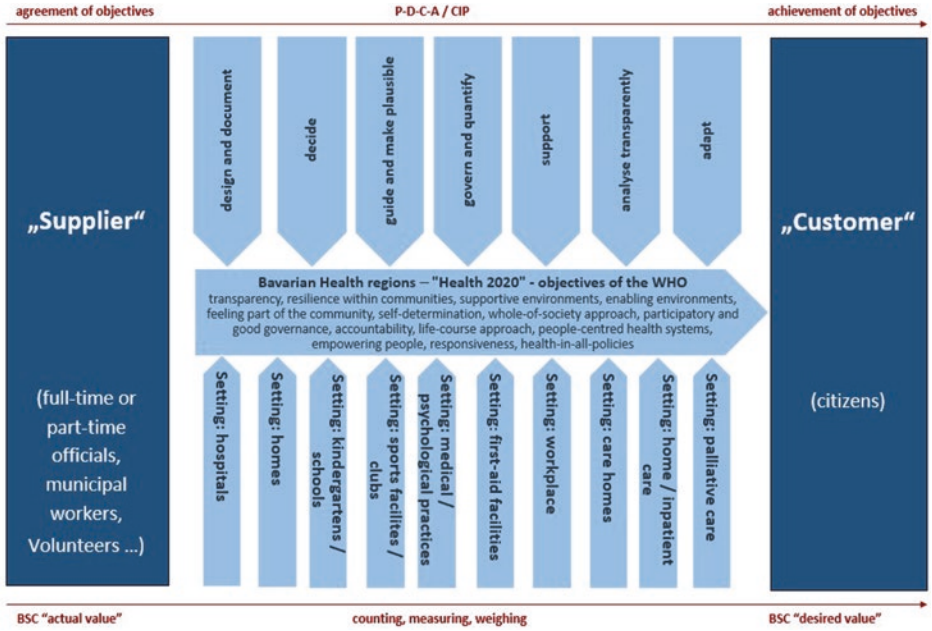

Fig. 12.1 Bavarian Health Regions—"Health 2020"—Objectives of the WHO

Austrian Health Objectives (in accordance with the Ottawa Charter's objectives) was developed for an Austrian pilot community by means of field of action research and document analysis. According to the inductive research design, the developers could hermeneutically identify structural as well as personal parameters within a small pilot region. They could also determine which of these parameters support the implementation of a health-focused quality management system within a community and which ones impede this implementation (Cassens et al., 2016). It should be stressed in this context that—30 years after the Ottawa Charter—there is still a considerable lack of knowledge among communal decision-makers about the following topics:

- The cross-sector responsibilities of communal policies regarding health ("Health in all policies" strategy)
- Largely free of charge offers by government and non-government institutions regarding prevention and health promotion
- Alternative approaches on the integration of all parties involved within one region
- The impending allocation problem
- The necessity to document and evaluate interventions and processes, also regarding future generations, in order to introduce a sustainable continual improvement process (CIP)

In the implementation period, the introduction of the quality management system was, partly also due to the aforementioned points, subject to problems well-documented in earlier reference processes. Lack of communication and fragmentary knowledge of the decision-makers, for instance, quickly led to one senior party (in this case the mayoress) taking over the quality approach, resulting in a decrease in motivation among the other parties involved (Linß, 2015). Among the positive aspects was the realization that the introduction of quality assurance processes leads to a transparency that allows the parties to faster detect redundancies, recommendations for action and responsibilities and in this way enabling them to introduce more focused implementation strategies.

These days many fields of health care are subject to the highest quality standards in order to continually improve effectiveness and efficiency, not only for ethical and medical purposes, but also as a result of the acute scarcity of resources. The most comprehensively developed quality standards in Europe are in the field of pharmaceutical and medical products as these products are subject to the highest quality and safety requirements through well-known guidelines such as the WHO, FDA, EU and ICH. Furthermore, corporate health managements in this context are mostly incorporated into the companies' general quality management systems. To adapt to the high quality requirements in the field of health care, the minimum requirements in the pharmaceutical markets as well as the general quality-related standards—such as DIN EN ISO, lean six sigma, and TQM—have been analysed and adapted for implementation within regional network structures (the Institute of Health and Social Affairs' (ifgs) communal quality management system (QMS) is under development). The indicators derived from this have now been made accessible within the institute together with the findings and evaluations of the first pilot project for the implementation of a communal quality management "healthy community" (Breisach & Porzelt, 2016).

12.4.3 Current Research Topic and Research Design

The Institute of Health and Social Affairs (ifgs) in Munich is currently involved in a follow-up project aimed at bundling the insights and evaluations from the Austrian pilot community with the results gathered in the extensive reference research regarding quality management adapted parameters for "healthy communities" and triangulates them with the already existing basic network structures in Bavarian health regions. The institute's preliminary talks with the decision-makers of two "Health Regions^{plus}" indicated a positive mutual interest in the modular implementation of a communal quality management system. The research question in this context is:

Is the modular-hermeneutical adaptation of the parameters relevant for health and quality management in "healthy communities" as developed by the Institute of Health and Social Affairs (ifgs) a suitable tool to promote a sustained procedural development in accordance with the "health in all policies" strategy in the "Health Regions^{plus}"?

Due to the research project's complexity, this question is to be tackled with the aid of the specifics mentioned below and by means of an inductive research design.

12.5 Project-Related Specifics

In the following we present details of which others may benefit who are looking into their health care resources.

12.5.1 Using a Cloud-Based Trans-Sectoral Software Solution

In every organisation the first implementation of quality management systems is initially accompanied by a fair amount of extra work and requires extra personnel. It is vital for the proceedings to achieve some results as soon as possible to keep all parties involved motivated. For this reason, a special software called "Business Process Asset Service" (BPAS) is being used. This software has already been developed and successfully implemented in other departments and provides a user-friendly input system that can be accessed from every software system within the communal network. Other beneficial features are the visualisation of event-driven process chains (EPC) and the system's capacity to trans-sectorally access and store multiple data structures (e.g. written documents, images, movies). The adaptation of the software to communal specifics is to be implemented within the project.

12.5.2 E-Health and the Clash with German Data Protection

By means of electronic information and communication technology (ICT), data is already being assembled and used within networks in the medical field in a resource-preserving and user-friendly way. As long as this data is used solely within the doctor-patient relationship, this is a widely accepted and legally secure procedure. As soon as inter-institutional electronic data storage and use is involved, a conflict between data protection ("right to self-determination over personal data") and health protection ("the right to life and physical safety") often arises—and not only in Germany.

Should a cross-sector evaluation with the objective of public health relevance be part of a project—which is the case in this one –, then the service providers' occupational freedom as well as the scientific freedom will also be affected. In legal terms each kind of storage and use of personal data is subject to the patient's declaration of consent or a special permission (Schneider, 2016). For this reason, legal counselling is vital from the very start and this aspect is covered by an involved lawyer in the current project.

12.5.3 Success Factors "Community Health Manager" (KGM) and Empowerment for Regional Health Promotion and Prevention

Meanwhile, some health regions in Bavaria have successfully completed their first pilot phases of trans-sectoral networking (2013-2015). In the follow-up phases the derived findings regarding the development of organisational processes are to be stabilised in a transparent and structured way that is acceptable to all parties involved, and the courses of action and the necessary documentation are to be entered into the cloud-based software system. To be able to continually meet these requirements as well as those of a "healthy community" in accordance with the health objectives aimed at by the WHO, an enhanced personal and professional support of the regional office managements is required. Regarding this, the Institute of Health and Social Affairs (ifgs) is in contact with a training and certification agency that, among other things, is specialized in the area of quality-assured management structures within the health sector. It is planned to implement a joint training initiative focused on communal health management, the curriculum of which will cover the need of software and process-specific teaching as well as going into the multi-sectorial prevention and health promotion within regional structures.

12.6 Conclusion

Most health care research experts point out that a sustained improvement of the overall health status in Germany will not be achieved by a mere increase in provided health care, but rather by a more focused, evidence-based distribution of existing health care resources (Robra, 2014). The German Prevention Act is currently creating the legal and monetary prerequisites so that efforts in regional and communal behavioural and circumstantial prevention are in accordance with the "health in all policies"-strategy. These should, from the very start, meet the requirements of a quality-assuring organisational development by a communal health management and should include local stakeholders. In accordance with A. Webber it is also necessary that business and health-related structures within a region form a closer network of cooperation (NBCH, 2013).

The basic prerequisite of a scientifically founded evaluation within a communal setting is the trans-sectorally standardised use of already available health report (GBE) indicators that are to be triangulated with other procedural indicators. This is a step that, above all, is meant to overcome the interface complexity of care providers, users, and other social partners. Suitable regional framework conditions, like adequately adapted software solutions, specially trained and qualified personnel and adaptations to existing data protection law are basic prerequisites for this new era of health strategies.

References

Badura, B. (2015). *Neue Wege für mehr Gesundheit – Qualitätsstandards für ein zielgruppenspezifisches Gesundheitsmanagement: Zahlen, Daten, Analysen aus allen Branchen der Wirtschaft.* Fehlzeiten-Report. Berlin: Springer.

Bechmann, S., Jäckle, R., Lück, P., & Herdegen, R. (2011). iga. Report 20. *Motive und Hemmnisse für Betriebliches Gesundheitsmanagement (BGM). Umfrage und Empfehlungen*. https://www.bgm-ag.ch/files/public/literatur/pdf/motive-und-hemmnisse-fuer-betriebliches-gesundheitsmanagement.pdf. Accessed 11 Feb 2020.

Braun, G., Gröbner, M., & Seitz, R. (2008). Evaluation vernetzter Versorgungsstrukturen: Ergebnisse einer empirischen Untersuchung. *Gesundheitsökonomie & Qualitätsmanagement, 13,* 358–364.

Breisach, T., & Porzelt, M. (2016). Effizienz- und Effektivitätssteigerung regionaler Gesundheitsversorgung durch „Kommunales Gesundheitsmanagement" (KGM). *ÖGPH-Newsletter*, S. 10–12.

Bühren, S. C., Müller, M., Neuber, N., Schmidt, R., Fröhlich, J., Senff, T., et al. (2015). Thüringenweite Befragung zum Betrieblichen Gesundheitsmanagement in Unternehmen und öffentlichen Einrichtungen. *Econpapers, 1,* 1–59.

Bundesministerium für Gesundheit. (2019). Förderung der psychischen Gesundheit und des Wohlbefindens am Arbeitsplatz. https://www.bundesgesundheitsministerium.de/themen/praevention/betriebliche-gesundheitsfoerderung/gesundheit-und-wohlbefinden-am-arbeitsplatz.html. Accessed 24 Mar 2020.

Bundesministerium für Gesundheit. (2015). GKV-Versorgungsstrukturgesetz. https://www.bundesgesundheitsministerium.de/service/begriffe-von-a-z/v/versorgungsstrukturgesetz.html. Accessed 24 Mar 2020.

Cassens, M., Wöhler, C., & Porzelt, M. (2016). Qualitätsmanagement – perspektivischer Allokationsdruck im kommunalen Setting. *Prävention und Gesundheitsförderung, 11,* 40–45.

Froböse, I., Wilke, C., & Biallas, B. (2011). Unternehmen unternehmen Gesundheit. *Betriebliche Gesundheitsförderung in kleinen und mittleren Unternehmen. Bundesministerium für Gesundheit (Hrsg.). Berlin*.

Gesunde Städte Netzwerk. (2017). 9-Punkte Programm. http://gesunde-staedte-netzwerk.de/9-punkte-programm/. Accessed 24 Mar 2020.

Linß, G. (2015). *Qualitätsmanagement für Ingenieure*. Hanser.

Morgner, A., & Eberlein-Gonska, M. (2011). Einleitung zur Fortsetzungsreihe: Gesundheitsregionen und vernetzte Gesundheit. *Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen, 105,* 606.

National Business Coalition on Health. (2013). *NBCH action briefs.* https://www.pcpcc.org/resource/national-business-coalition-health-action-briefs. Accessed 24 Mar 2020.

Porzelt, M., & Breisach, T. (2016). Effizienz- und Effektivitätssteigerung regionaler Gesundheitsversorgung durch „Kommunales Gesundheitsmanagement" (KGM): Adaption des hohen Qualitätssicherungsstandards der Pharmabranche auf die Gesundheitsorganisation regionaler Strukturen. *ÖGPH-Newsletter*, März, 10–12.

Reimer, H. (2006). BMBF: Die Hightech-Strategie für Deutschland. *Datenschutz und Datensicherheit – DuD,* 30, 665–666.

Robra, B.-P. (2014). John E. Wennberg, Pionier der regionalen Versorgungsforschung: Was kann eine deutsche Versorgungswissenschaft von ihm lernen? *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz, 57,* 164–168.

Schneider, U.K. (2016). *Einrichtungsübergreifende elektronische Patientenakten: Zwischen Datenschutz und Gesundheitsschutz* (DuD-Fachbeiträge). Springer Vieweg.

Techniker Krankenkasse. (2008). "Gesunde Kommune": Die TK fördert Städte, Gemeinden und Regionen. https://www.tk.de/tk/vorsorge-und-frueherkennen/gesunde-lebenswelten/gesunde-kommune/39532. Accessed 18 Feb 2020.

von Ruschkowski, E. (2002). Lokale Agenda 21 in Deutschland – eine Bilanz. *Aus Politik und Zeitgeschichte,* B, 31–32.

Webber, A. (2011). Businesses as partners to improve community health. *American Journal of Preventive Medicine, 40*(1), S84–S85.

Part IV

Work and Innovation

Ambulatory Assessment as a Heuristic Research Method in the Field of Occupational Rehabilitation

13

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Abstract

Over the past decade, the research method Ambulatory Assessment has gained growing interest in diverse areas of application. Besides other methodological advantages related to the real-time and real-life quality of this measurement, the multiple questioning of subjects regarding recent or momentary experiences offers the investigation of interesting and heuristic within-subject research questions. After providing a short introduction into the general benefits of the Ambulatory Assessment method, we present three studies conducted within occupational rehabilitation. While the first study addresses the question, which environmental factors are most influential in predicting the momentary affective well-being of adult occupational rehabilitants at the beginning of a commercial qualification measure, the second study focuses on the special context of external practical training. The third study was conducted among adolescent occupational rehabilitants, whereby Ambulatory Assessment was used as a supporting tool for self-efficacy training by monitoring the daily experiences of the

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participants. These studies illuminate the broad and heuristic application possibilities of Ambulatory Assessment within the special context of occupational rehabilitation, which are finally summarized.

13.1 Introduction

Ambulatory Assessment is a collective term for different data collection methods that take place in the field and assess ongoing behavior, experience, physiology as well as environmental aspects (Society for Ambulatory Assessment, 2014). This means that the participants of Ambulatory Assessment studies are repeatedly asked short questions about their momentary mood and behavior as well as momentary situational aspects like positive or negative events, while they do what they usually do and while they are where they usually are, e.g. at work. Therefore, Bolger et al. (2003, p. 597) characterized Ambulatory Assessment as a method that "captures life as it is lived". Depending on the type of data collection, different assessment strategies are distinguished: In experience sampling studies, momentary mood, situation, and behavior are assessed signal-based, which means that the participants are requested to fill out the questionnaire in each case when the smartphone rings. The alarm can be set at fixed or random times. A study investigating working situations, for example, could trigger the data collection at 10 am, 13 pm, and 15 pm or at three random times between 8 am and 17 pm. In event sampling studies, data collection is triggered by the occurrence of an event. For example, people could be asked to fill out a questionnaire every time before they go to bed, after each contact with their supervisor or every time after a performance feedback. A further assessment strategy refers to the continuous sampling of physiological or technical data applying physiological sensors or GPS. The main benefits of the Ambulatory Assessment method can be described with three keywords: Real-time, real-life and within-person.

Real-time (Schwarz, 2012). Ambulatory Assessment studies are less prone to retrospective biases because the questions refer to momentary or very recent experiences. A demonstrative example for the difference between retrospective and real-time questions is the rosy view effect found by Mitchell et al. (1997). In their series of longitudinal studies, participants answered questions before, during and after their vacation trips about their expected, actual and remembered enjoyment. This research team found that the participants' expectations as well as their recollection of their vacation trips were more positive than the real-time experiences they actually had. Among others, negative expectation violations emerged as a mediator—in the study about a bicycle trip, for example, 61 % of the participants reported that something worse than expected had occurred. However, only 11 % also remembered these feelings of disappointment.

As all steps on the way from a question to the answer—interpretation of the question, recall of relevant information and selection, producing an answer and transferring it to the response format—are prone to distorting influences, Ambulatory Assessment data is not free from bias. It can nevertheless be argued that Ambulatory Assessment data could

be less susceptible to biases that arise from the recall of past events and their experience (Schwarz, 2012).

Real-life (Reis, 2012). As data collection takes place in the natural environment of the subjects, Ambulatory Assessment data shows a high external validity. Aside from the control of context effects, Ambulatory Assessment offers the possibility of analyzing associations between contextual conditions and subjective experiences or behavior. For example, an Ambulatory Assessment study could address the question, which situational conditions are associated with feelings of distress among occupational rehabilitants during practical training. It is important to note that Ambulatory Assessment studies usually cannot inform about causality, as characteristics of the subjects and their natural environments are confounded. Nonetheless, Ambulatory Assessment offers insights into individual micro-relationships, a further advantage, which is labeled with the keyword within-person.

Within-person (Hamaker, 2012). We know from many Ambulatory Assessment studies that working conditions as well as well-being are highly variable within persons. Johnston et al. (2016), for example, report in their nursing study intraclass correlations of .17 for demand and of .23 for control, suggesting that there is a great amount of variance located at the situational level of working characteristics. At an intraclass correlation range between .39 and .44 nurses also differed more strongly with regard to their current stress experience, affect and fatigue than they differed between each other on their mean level. These results clearly support the value of investigating, which situations are experienced as stressful and why.

As between-subject studies are dominating, broad knowledge is present, which personal characteristics and working conditions individuals report who suffer from elevated stress levels. However, results from between-subject studies can only be transferred to within-subject processes under the condition of ergodicity (Hamaker, 2012). For example, a study could address the question, which perceived working conditions during practical training are associated with feelings of stress and overload in occupational rehabilitants by asking them to fill out a questionnaire after completing the practical training. A hypothesis could be that occupational rehabilitants experiencing high control during their practical training report lower stress levels. For the conclusion that the well-being of occupational rehabilitants during practical training could be promoted by enhancing autonomy, ergodicity is required, that is, the population parameters have to equate to within-parameters. In the context of the example, ergodicity would imply that all individuals show the same mean over time regarding job control as well as stress experiences, that they exhibit the same variances in these variables and moreover, that the relationship between control and stress is the same for all occupational rehabilitants. These parameters are not likely to be met as it is across most psychological phenomena. Therefore, theoretical models have to be examined from a within-subject perspective in order to draw intervention approaches from them (Johnston et al., 2016). Following a within-subject design, Ambulatory Assessment studies provide this kind of data: In a study addressing the exemplary research question that high control is associated with

low stress, occupational rehabilitants would be asked repeatedly during practical training, which extent of control they are provided with and how they feel right now. If this study finds that an increase of control is associated with lower stress levels, this result would indeed support autonomy as a starting point for interventions.

A further advantage of this design is the assessment, how many individuals show a certain effect by estimating the random effect variance, which represents the variance of a fixed effect (average regression slope). In a study among 41 nurses, elevated control showed a significant negative effect on distress on average, but the regression slopes varied significantly between people (Wimmer & Thomas, 2016). Estimated from the variance of the fixed effect, a stress-reducing effect of elevated control was true for 73 % of the participants while for the remaining 27 % there was a negative or no effect of high autonomy. It is beneficial to know for how many people an average effect is valid, as it can be taxed whether and to what extent an action of intervention will be useless or even harmful for a part of the target group.

By calculating so-called cross-level interactions, it can be further investigated on which personal characteristics the beneficial effect of a certain situational condition depends. In the nursing study (Wimmer & Thomas, 2016), for example, the personality variable desire for control (Burger & Cooper, 1979) was found to moderate the effect of control on distress: While people high in desire for control benefited from high control, the reverse was true for people low in desire for control. In this group high control was associated with an increase in distress. Considering the benefits of Ambulatory Assessment, this method is fruitful and heuristic for a variety of research domains including clinical psychology (Trull et al., 2012), developmental psychology (Hektner, 2012) and organizational psychology (Beal, 2012) as well as personality (Fleeson & Noftle, 2012) and emotion research (Augustine & Larsen, 2012). The next section will give an insight into the application of Ambulatory Assessment within occupational rehabilitation.

13.2 Study 1: Predictors of Affective Well-Being Among Occupational Rehabilitants

For occupational rehabilitants, the period of obtaining and regaining occupational qualification is a highly demanding time with many challenges, problems, and uncertainties. Compared to the general population, occupational rehabilitants show higher levels of depression, anxiety, and exhaustion (Michalski et al., 2008). The main difficulty during occupational retraining retrospectively reported by occupational rehabilitants is overload with respect to the time available (Hofbauer, 1977). Besides challenges associated with the training measure itself, many rehabilitants additionally suffer from financial and family problems (Hofbauer, 1977). However, which environmental factors are most influential in predicting the momentary affective well-being of occupational rehabilitants? This question was addressed within a study conducted in cooperation with a large German centre for adult occupational rehabilitation.

13.2.1 Method

Twenty-six occupational rehabilitants took part in this study. All of the participants were at the beginning of a three-year commercial qualification measure. Thirteen of the subjects were male, 13 female. Twelve of the subjects reported a physical illness (often musculoskeletal disorders), 14 people a psychiatric disease (depression, schizophrenia, personality disorders). The participants were between 21 and 50 years old ($M = 37.5$, $SD = 7.8$).

The smartphone-based data sampling lasted five days with four or five surveys per day. In total, 546 questionnaires were filled out, which included the same 22 items in each situation. Completing the questionnaire took on average two minutes. Nine percent of the alarms triggering the smartphone questionnaire were ignored, while a part of the missed alarms could be traced to exams that the subjects had to take.

All situational variables were assessed by single-item measures, which is suggested to be acceptable within experience sampling studies, as long as the construct is not complex in nature and the answer format allows differentiated statements (Fisher & To, 2012). Each question was rated on a seven-point Likert scale. Affective well-being was assessed by the three principal axes displeased-pleased, anxious-contented and depressed-enthusiastic as suggested by Warr (1990). Following typical operationalizations (de Jonge & Schaufeli, 1998), the first axis was measured by the item "satisfied—dissatisfied", the second axis by the item "relaxed—tense" and the third axis by the item "happy—depressed". In consultation with the rehabilitation centre, three types of stressors were assessed: (1) Task-related demands (working fast: "At the moment, I have to work very fast", multitasking: "At the moment, I have to work on many tasks at the same time", highly-skilled tasks: "My momentary task requires high skills"), (2) private problems ("At the moment, I am concerned with private problems") and (3) bad group atmosphere ("At the moment, there is a bad atmosphere in the group").

Statistical Analyses

Because of the hierarchical data structure including within-person variables (called level-1 variables) and between-person variables (called level-2 variables) multilevel models were built. Each predictor variable was considered separately. The easiest thinking of multilevel models is to imagine that for each person a separate regression model is calculated, while in a next step, the parameter estimates of all persons are further processed (Nezlek, 2011). For example, for each person a regression could be calculated to predict the effect of working demands on stress experience. Afterwards, the regression slopes of all people could be used as a dependent variable in a new model by which it could be analyzed whether the between-subject variable psychiatric illness predicts a higher slope coefficient compared to healthy people. In case of a significant positive effect of psychiatric illness on the effect of working fast on stress experience, it could be concluded that mentally ill people are less resilient facing high demands. As already mentioned in the introduction, the effect of a between-subject variable like psychiatric illness on the effect of a within-subject variable like working demands is called

crosslevel interaction. However, in multilevel models both levels are actually analyzed simultaneously.

13.2.2 Results

First, the intraclass correlations of all variables were computed. For seven of the eight variables it was true that a great amount of variance was located at the within-subject level. With respect to feelings of dissatisfaction ($ICC = .41$) and tension ($ICC = .43$) as well as the rating of task-related demands ($ICC = .19$ for highly skilled tasks, $ICC = .33$ for working fast, $ICC = .36$ for multitasking), people differed more strongly in their current experience than they differed between each other on their mean level. For feelings of depression ($ICC = .51$) and the rating of the group atmosphere ($ICC = .47$), the variances were equally distributed between both levels. Only the variable being concerned with private problems showed an intraclass correlation markedly higher than .50 ($ICC = .64$) suggesting that between-subject differences outweighed within-subject differences.

Models

All five predictors showed significant fixed effects (average slope coefficients) on the dependent variable tension (see Table 13.1). By comparison of the standardized beta coefficients of the five models with tension as dependent variable, working fast and multitasking showed the strongest effect followed by private problems and group atmosphere. The smallest contribution to explain fluctuations in tension was provided by the variable highly skilled activities. The latter three variables showed significant or marginally significant random effect variances (variances of the slope coefficients between the subjects) meaning that the strength of the effects of private problems, group atmosphere and highly skilled tasks on feelings of tension was not the same for all subjects. While there was a positive effect of working fast and multitasking on tension for all of the participants (the percentage of subjects that showed a slope coefficient greater than zero was near 100 %), the other effects were also valid for the majority of the subjects (see Table 13.1).

Predicting dissatisfaction, four of the five stressors showed significant positive effects on average (see Table 13.1). Only highly-skilled activities were not associated with a mean increase or decrease of dissatisfaction. However, with respect to this variable, there was a pronounced variance of the slope coefficient, which leads to the conclusion that some people were more satisfied when the skill-level of their activities increased while others reacted with dissatisfaction. Estimated 50 % of the subjects showed an effect of highly-skilled activities on satisfaction greater than zero, but for the remaining 50 % the slope coefficient was negative. Comparing the standardized beta coefficients, the strongest predictor for reduced satisfaction was a bad group atmosphere—an association with dissatisfaction was found for estimated 95 % of the subjects. Private problems also seemed to be more relevant for feelings of dissatisfaction than both task-related demands working fast and multitasking. A significant or marginally significant variance of the strength of the slope coefficients was found for multitasking and private problems.

Table 13.1 Multilevel Model Estimates for Tension, Dissatisfaction and Depression

Model	Predictor variables	Standardized fixed effects	Random effects variance	Percentage showing effect
Tension	Working fast	**.27****	0.01	.99
	Multitasking	**.29****	0.01	1.00
	Highly-skilled tasks	.18*	0.04*	.75
	Private problems	.24**	0.03^{+}	.94
	Group atmosphere	.23**	0.06^{+}	.86
Dissatisfaction	Working fast	.12*	0.02	.78
	Multitasking	.14*	0.03+	.79
	Highly-skilled tasks	.00	0.05*	.50
	Private problems	**.21***	0.10*	.75
	Group atmosphere	**.28****	0.04	.95
Depression	Working fast	.11*	0.01	.86
	Multitasking	.06	0.00	.85
	Highly-skilled tasks	.03	0.02*	.56
	Private problems	**.39****	0.07*	.91
	Group atmosphere	**.24****	0.86^{+}	.86

Note. The two strongest predictors for each dependent variable are printed in bold
**$p < .01$; *$p < .05$; $^{+}p < .10$

For increased feelings of depression, private problems were most predictive followed by a bad group atmosphere (see Table 13.1). Among the task-related predictors only working fast showed a significant positive effect on average. However, compared to the strength of the effects of the social stressors, the effect of working fast on momentary depression seemed to be negligible. Significant or marginally significant variances of the slope coefficients existed for highly-skilled tasks, private problems and group atmosphere.

Cross-level Interaction

As already mentioned, multilevel models offer the possibility to analyze whether the mean of the dependent variable or the strength of an effect varies depending on a between-subject variable like sex, age or personality. In this study, the focus was on the between-subject variable psychiatric disorder present or absent. While mentally ill rehabilitants did not report higher mean levels of tension ($b = .48$, $SE = .50$, $p = .342$) or dissatisfaction ($b = .41$, $SE = .41$, $p = .405$), they exhibited higher mean depression values compared to mentally healthy subjects ($b = 1.12$, $SE = .44$, $p = .018$). For the dependent variable satisfaction, a cross-level interaction between mental illness and multitasking was revealed. Compared with mentally healthy people, subjects with a psychiatric disorder showed a significantly higher increase in dissatisfaction when confronted with multiple tasks ($b = .26$, $SE = .09$, $p = .012$). Figure 13.1 illustrates the interaction over both

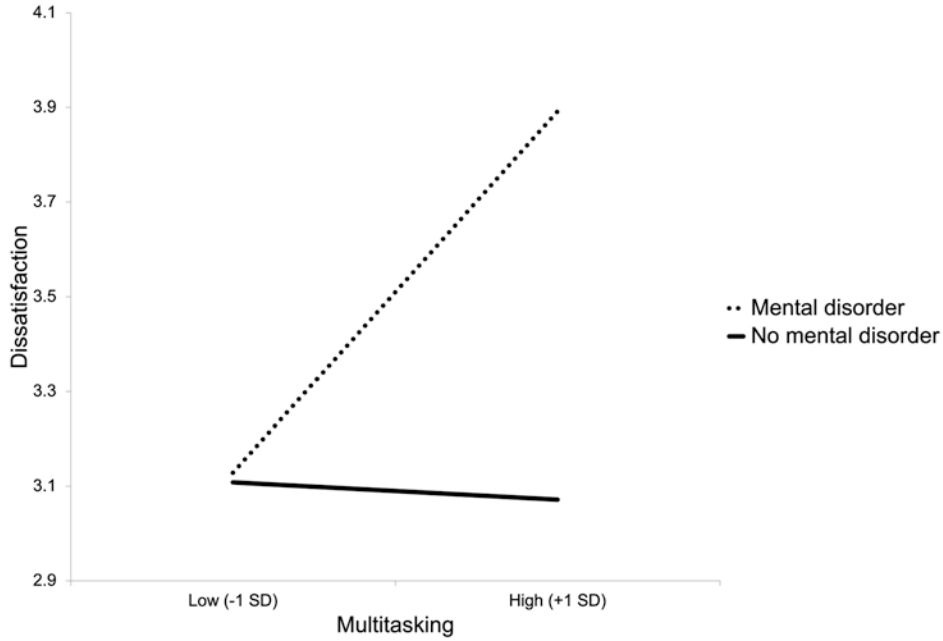

Fig. 13.1 Moderating Role of Psychiatric Illness in the Relationship between Multitasking and Dissatisfaction

levels—for people without mental disorder multiple tasks had no effect on satisfaction, while for mentally-ill subjects they were strongly associated with growing discontent.

13.2.3 Discussion

This study shows that the affective well-being of occupational rehabilitants is highly variable in different situations. While for feelings of tension task-related demands played an important role, they scarcely influenced feelings of satisfaction and happiness, which were strongly associated with private problems and group atmosphere. As the latter two were also predictive for tension, the affective well-being of occupational rehabilitants seemed to be more depending on private problems and group atmosphere than on task-related demands. While institutions for occupational rehabilitations pay particular attention on person-environment fit with respect to task-related demands, the results of this study suggest that a greater support in case of private problems and an increased focus on the establishment of a positive group atmosphere could be a fruitful approach to foster the affective well-being of occupational rehabilitants.

This study is illustrative of the benefits of a within-subject focus. A variable that shows no mean influence on a dependent variable is not necessarily negligible. In case

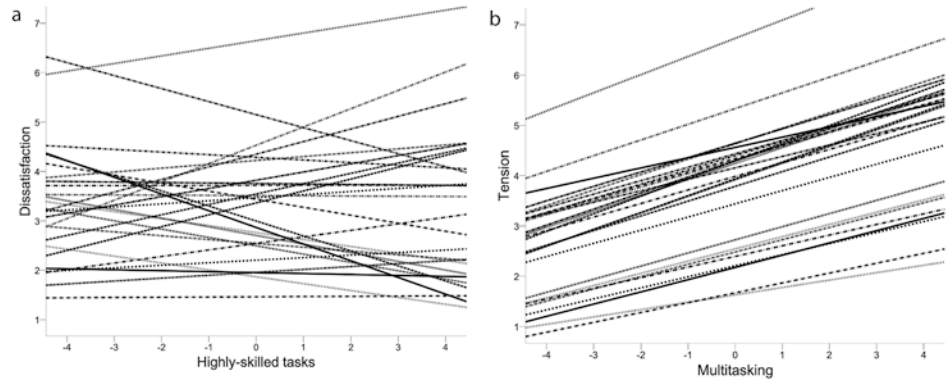

Fig. 13.2 **a** Plots of Individual Regression Slopes for Highly-skilled Tasks on Dissatisfaction. **b** Plots of Individual Regression Slopes for Multitasking on Tension

of a high random effect variance, the zero finding can be owed to a very diverse effect of this variable between people. A good example for this phenomenon is the variable highly-skilled activities. As shown in Fig. 13.2a, for many rehabilitants there was indeed an influence of this variable on feelings of satisfaction, but the direction of this influence differed strongly between the subjects. While feelings of satisfaction were enhanced by increasing task difficulty for some subjects, the reverse was true for other rehabilitants. Unfortunately, we failed to explain these differences by a between-subject variable like psychiatric illness. We assume that a variable like achievement motive or self-efficacy could be predictive in this constellation. For other variables that show a strong mean effect on well-being, it is interesting to know, for how many people an effect is valid as this information allows to estimate whether and to what extent an intervention would be useless or even harmful for a part of the target group. Contrasting the finding for highly-skilled activities, the figure for tension depending on multitasking (Fig. 13.2b) shows a uniform influence of a predictor on a dependent variable—a reduction in multitasking would lower feelings of tension for all subjects.

13.3 Study 2: Daily Affective Well-Being Among Occupational Rehabilitants During Their Practical Training

Psychological stress in working environments is often defined as job strain according to the job demand-control (JDC) model by Karasek (1979) or the extended job demand-control-support (JDCS) model by Johnson and Hall (1988). Using a sample of adult occupational rehabilitants, we conducted an Ambulatory Assessment study to investigate the applicability of the JDCS model to occupational rehabilitants while being in an external practical training. The model postulates that an individual's stress experience is determined by the amount of job demands combined with the level of control and/or

social support. Accordingly, control and support are supposed to act as resources buffering the negative effect of high job demands on well-being.

For rehabilitants, the practical training in an external work placement marks the step from a safe and caring rehabilitation environment into a challenging and demanding working environment. This means facing a new social work environment as well as a variety of new tasks and stressors. A self-imposed pressure to perform and achieve and feelings of uncertainty, anxiety and strain are omnipresent (Meschnig et al., 2015). As such occupational changes are usually characterized by a high variability in subjective well-being and situational characteristics, Ambulatory Assessment studies seem to be an appropriate way to study and monitor psychological health in rehabilitative practical trainings.

In previous Ambulatory Assessment research, several ambulatory markers of stress were studied, e.g. subjective ratings (Johnston et al., 2013; Riedl & Thomas, 2019), physiological recordings (Johnston et al., 2016), or behavioral parameters (Giakoumis et al., 2012). While some Ambulatory Assessment studies support the JDC/JDCS models as predictors of daily occupational stress (e.g. Johnston et al., 2013; Rau et al., 2001), to date there is no research on the interplay between daily job demands and resources concerning specifically the sector of occupational rehabilitation and, all the more, rehabilitative practical trainings. Therefore, the present study focused on daily subjective strain determined by the JDCS model during rehabilitative practical trainings. That is, we concentrated on the interactive effects of demands (quantitative vs. qualitative) and resources (control vs. support) on well-being.

13.3.1 Method

The study sample consisted of 36 German occupational rehabilitants taking part in a three-year commercial qualification measure and being at the beginning of their external practical training. Twenty-five of the participants were male, 11 female. The subjects ranged in age from 25 to 51 years ($M = 36.5$, $SD = 6.8$). They underwent a smartphone-based Ambulatory Assessment three times a day over the course of the first two weeks of their practical training. The questionnaire contained 20 questions, which took about three minutes to answer. In total, 668 ambulatory questionnaires were filled out resulting in a compliance rate of 70 %.

The daily assessment contained measures of different job demands, control, support, and well-being. Each item was rated on a six-point Likert scale. In particular, well-being was assessed by four bipolar items referring to the basic dimensions of mood according to Wilhelm and Schoebi (2007): That is, among others, calmness (“relaxed – tense”, “agitated – calm”) and valence (“content – discontent”, “unwell – well”). The JDCS measures were adapted from the Job Content Questionnaire (Karasek et al., 1998) including two items for quantitative job demands (“During the past two hours, I worked

under time pressure", "… I had to work on many things at the same time"), two items for qualitative job demands ("… I had to work on difficult tasks", "… an error on my part could have caused seriously high damage"), three items for job control (e.g. "… I had a high decision freedom", "… I could make own decisions"), and four items for social support (e.g. "… my supervisor was helpful", "…my coworkers were interested in me").

Statistical Analyses
Again, multilevel models were built separately for each outcome (calmness and valence) and each demand type (quantitative vs. qualitative demands). The independent variables were entered in three steps. The first model includes the independent variables demands, control and support without interaction (additive model). In the second step, the interaction terms D x C, D x S and C x S were entered (two-way interaction model). Finally, the interaction D x C x S was included (three-way interaction model).

13.3.2 Results

Considering the fixed effects of the JDCS predictors, multilevel analysis indicated that quantitative ($b = -.17$, $SE = .05$, $p < .01$) and qualitative job demands ($b = -.16$, $SE = .05$, $p < .01$) were negatively associated and control ($b = .04$, $SE = .02$, $p = .015$) and support ($b = .14$, $SE = .04$, $p < .01$) were positively associated with well-being. All fixed effects estimates listed here refer to valence as dependent variable, but roughly, the same applied for calmness. An analysis of the standardized beta coefficients of the buffering variables revealed a stronger effect for support ($\beta = .28$) compared to control ($\beta = .08$) in explaining fluctuations in valence. Regarding the multiplicative models, results also indicated that social support significantly buffered the relationship between qualitative job demands and well-being ($b = .03$, $SE = .01$, $p < .01$) and marginally the relationship between quantitative job demands and well-being ($b = .03$, $SE = .01$, $p = .071$). That is, the negative effect of qualitative (and to some extend quantitative) job demands on valence was less pronounced when high social support was present. In contrast, control neither buffered the relationship between quantitative ($b = .01$, $SE = .01$, $p = .667$) nor between qualitative job demands ($b = -.002$, $SE = .01$, $p = .836$) and well-being. Interestingly, the effect of control on well-being also marginally depended on the level of social support ($b = .01$, $SE = .01$, $p = .100$) suggesting that high control as a resource was less useful when the working environment did not provide enough social support. In line with this, we also found a substantial but not significant three-way interaction between qualitative job demands, control and support on valence ($b = -.01$, $SE = .00$, $p = .103$). As shown in Fig. 13.3, the stress buffering effect of job control on valence was more pronounced when participants experienced high social support.

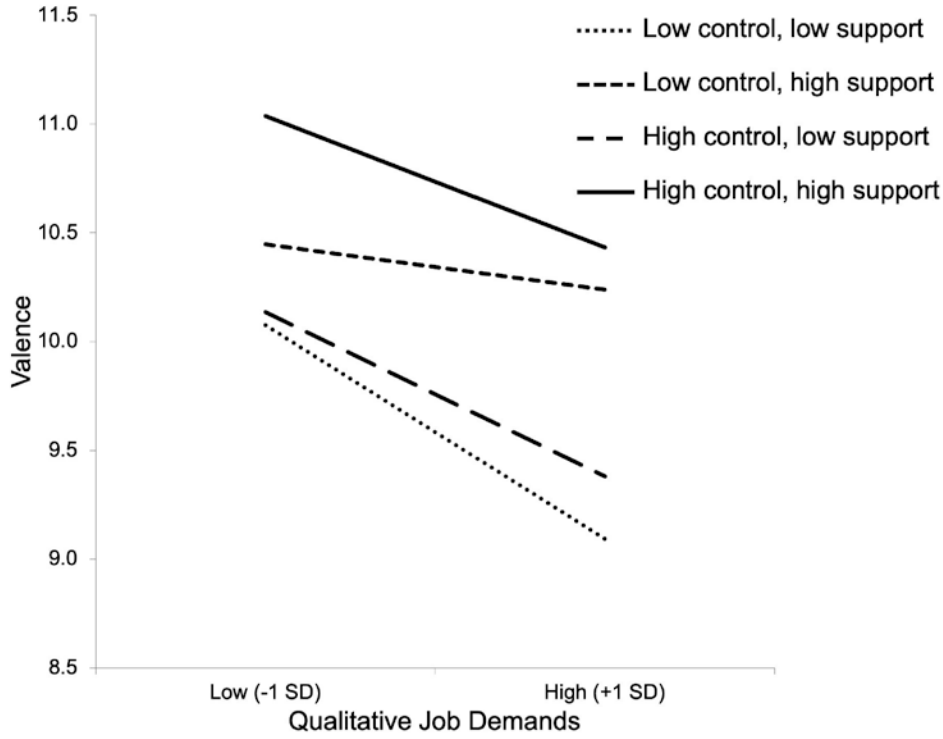

Fig. 13.3 Three-way Interaction between Qualitative Job Demands, Control and Support on Valence

13.3.3 Discussion

This study shows that the job demand-control-support model is, in fact, applicable to occupational rehabilitative practical trainings. The additive models revealed the expected negative effects for demands and positive effects for control and support paralleling the findings of many previous studies (Häusser et al., 2010). While support emerged as a significant or marginally significant buffering variable against both types of job demands, there was no evidence for a two-way interaction between control and job demands. Many previous studies also failed to provide evidence for the interaction between job demands and control (e.g. Johnston et al., 2016). From our point of view, the strong effect for support—compared to control—on well-being as well as the statistical tendencies for C x S- and D x C x S-interactions deserve special attention. It is well-known that high levels of support seem to play an essential role for rehabilitants (Meschnig et al., 2015) or for high pressure work environments in general (Turner et al., 2012). Given the special characteristics of our study setting (new work environment combined with a high pressure to perform), it seems plausible that the beneficial effect of high control is particularly evident

when the rehabilitants simultaneously feel socially strengthened. That is, support is useful not only to buffer the negative effects of high demands, but also in order to benefit from the positive effects of control.

These findings offer several theoretical contributions to occupational stress and rehabilitation research as well as methodological and practical implications. First, the Ambulatory Assessment approach highlighted that smartphone monitoring is a valuable instrument for detecting associations between temporal variations in affective well-being and working conditions. Second, this study stresses the importance of a supportive working environment in rehabilitative practical trainings. Providing social support in order to enhance well-being in occupational rehabilitation and practical trainings should have priority within differential workplace interventions—concentrating purely on heightened control may not be sufficient (Lawson et al., 2009). Nonetheless, due to some methodological limitations, the current results should be interpreted with caution, especially with regard to the small sample size. Therefore, future research would benefit from further Ambulatory Assessment studies about practical trainings in occupational rehabilitation, which may also consider other types of resources or methods (e.g., Schmid & Thomas, 2019, 2020; Schmid et al., 2019).

13.4 Study 3: Ambulatory Assessment as a Monitoring Tool Supporting Self-efficacy Training in Adolescent Occupational Rehabilitants

The following intervention study investigates the effects of Ambulatory Monitoring combined with self-efficacy training on performance-related self-efficacy among young occupational rehabilitants suffering from learning disabilities. The study results concerning social self-efficacy and desire for control have already been published earlier (Moraß et al., 2018).

The transition from school to job is a difficult developmental task, especially due to the large number of demands (Pavlova et al., 2017). Starting an occupational qualification measure means facing new social, emotional, role-based, and professional demands. This is particularly true for young occupational rehabilitants. They often overestimate their own abilities, for example in handling social interactions, which in turn leads to failure and reduced experience of self-efficacy (Eser & Sedlatschek-Dussling, 2005). This lack of trust in own abilities in overcoming difficulties often results in resignation and discourage, especially when being confronted with new (challenging) tasks (Bandura, 1982). In consultation with experts in the area of adolescent occupational rehabilitation, self-efficacy was identified as a construct with crucial importance for a successful rehabilitation. Self-efficacy is "concerned […] with what you believe you can do with what you have under a variety of circumstances" (Bandura, 1997, pp. 37) and is associated with different positive effects like increased motivation, optimism, better performance and better physical and mental well-being (Bandura & Locke, 2003; Caprara

et al., 2006; Luszczynska et al., 2005). Thereby different domains of self-efficacy are differentiated, e.g. performance-related self-efficacy. An important question is, however, how people develop self-efficacy. Following Bandura (1986, 1997), the best way to promote self-efficacy is to learn about own abilities for problem solving, e.g. by mastery experiences or persuasion.

Against this background, the present study investigates, whether a self-efficacy training supported by an Ambulatory Monitoring of daily life experiences or the smartphone-based monitoring alone influence adolescents' performance-related self-efficacy in a positive manner.

13.4.1 Method

Twenty-nine adolescent occupational rehabilitants (10 female, 19 male) living at a German rehabilitative boarding school took part in the study. All of them suffered from learning disabilities (partially accompanied by physical and/or mental disabilities).

The adolescents were randomly assigned to experimental group 1 (EG 1, 13 adolescents, monitoring plus self-efficacy training) and experimental group 2 (EG 2, 16 adolescents, monitoring only). The two groups did not differ in the pretest-values of the measured variables. Performance-related self-efficacy as dependent variable was assessed three times. Before starting the monitoring (pretest, T1), after the intervention (posttest, T2), and three weeks later (follow-up, T3). The intervention was conducted over a time span of 17 days. Every participant in EG 1 received four individual training sessions aimed at increasing self-efficacy by discovering and activating personal resources and attributing individual achievements to own competences, while the graphically prepared monitoring data provided the basis for the dialogue (see Fig. 13.4). The Ambulatory Monitoring focusing on situational experiences was conducted via smartphones at three fixed times a day (lunchtime, after work, before going to bed).

In the Ambulatory Monitoring, the participants were asked whether they had experienced positive or negative situations relating to performance, authority figures or peers. In this case, they were requested to state a keyword as anchor for remembering. Afterwards, they were asked to what extent they personally had control over the situation. Finally, the participants rated seven items measuring momentary well-being. Depending on the occurrence or non-occurrence of the situations, 13 to 25 questions were presented. The dependent variable professional/school-related self-efficacy was measured with a simplified and shortened scale based on the measure of Jerusalem and Satow (1999), in order to have regard to the cognitive limitations of the subjects.

Statistical Analyses

For analyzing the effects of monitoring plus training and monitoring alone, mixed ANOVAs with time of measurement as within-subject factor and Time of Measurement x Experimental Group as mixed within- and between-subject factor were conducted.

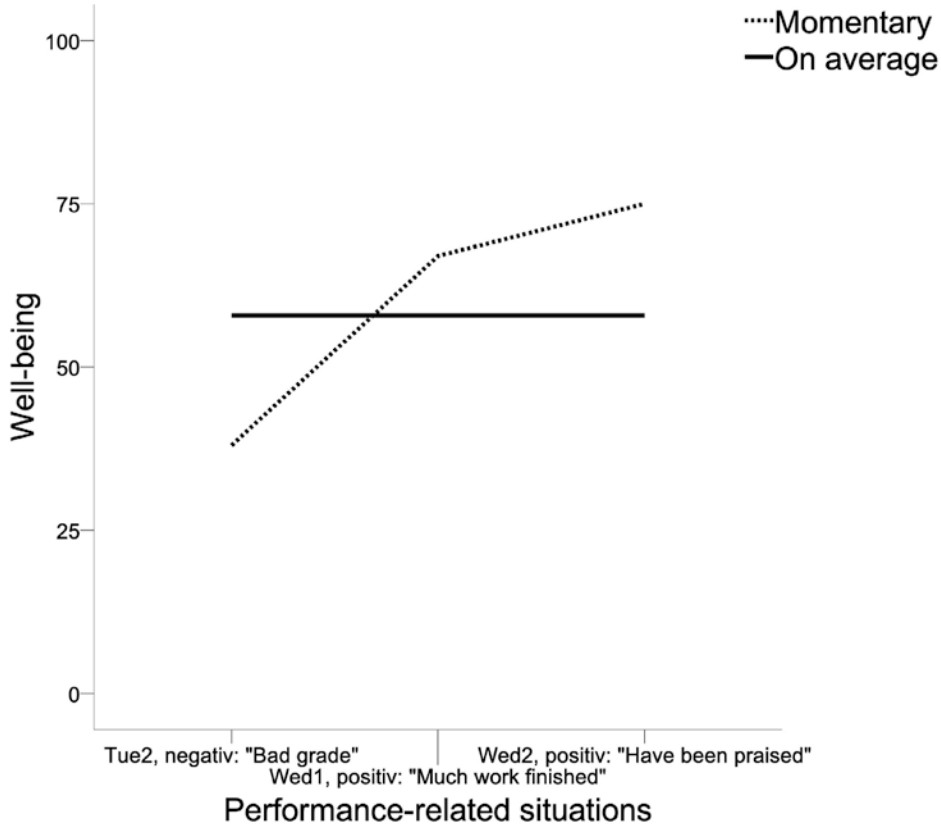

Fig. 13.4 Exemplary Graphic Used to Support the Training (Based on the Monitoring Data of One Week of One Participant)

13.4.2 Results

For school-related self-efficacy, a significant effect of the repeated measurement was found, but only for a quadratic trend ($F(2,54) = 4.51$, $p < .043$, $\eta 2 = .09$): While school-related self-efficacy increased significantly from T1 to T2 ($M_{T1–T2} = -1.10$, $SE = 0.42$, $p = .014$), this difference was no longer evident at T3 ($M_{T1–T3} = -.32$, $SE = 0.49$, $p = .516$) (Fig. 13.5). There were no differences between the groups ($F(2,54) = 1.51$, $p = .116$).

13.4.3 Discussion

The study shows that school-related self-efficacy can be increased by ambulatory monitoring or ambulatory monitoring combined with training, respectively. While

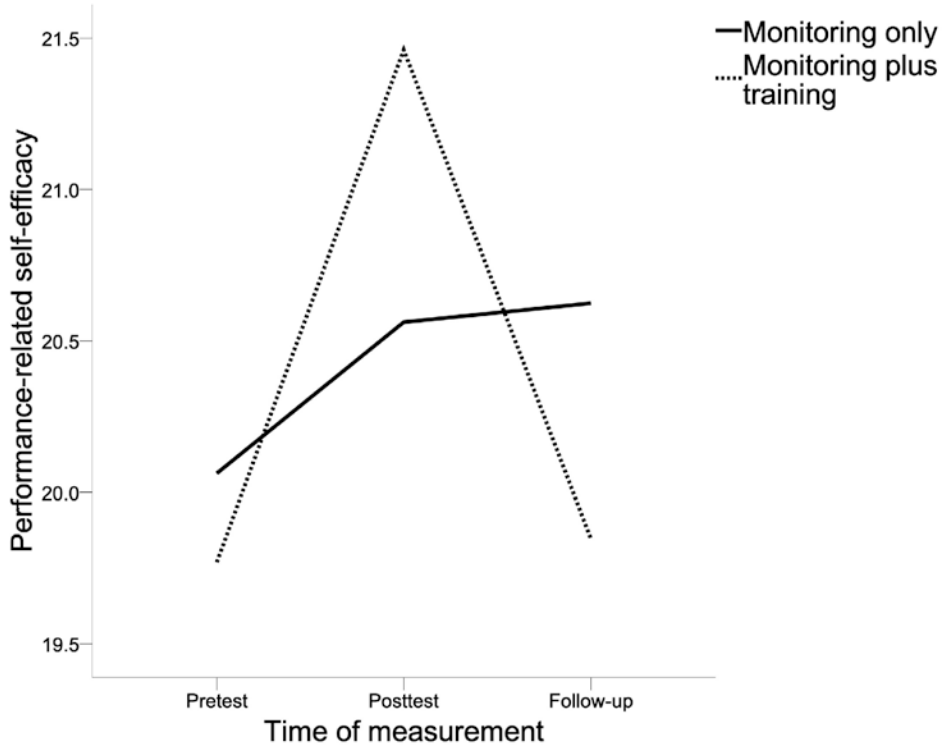

Fig. 13.5 Effects of Monitoring plus Training and Monitoring Only on Performance-related Self-efficacy

a positive effect was found from pretest to posttest, this effect disappeared in the follow-up. Contrary to our expectations, there was no difference between the group Ambulatory Monitoring combined with training and the group Ambulatory Monitoring only. There are different possibilities to explain this phenomenon. One reason might be that the adolescents in EG 2 were able to reflect on their experiences without a coach (Reid et al., 2009). Another reason can be seen in the smartphone itself as a resource for self-efficacy, because the participants got attention from other adolescents and from the facilitator (because of possessing a modern smartphone and being allowed to use it despite the cellphone ban).

These findings offer diverse implications for further use of Ambulatory Assessment strategies as a monitoring tool, for future research on the development of self-efficacy-trainings and for practical issues. Among others, future investigations should focus on a longer time span and implement a passive (waiting) control group. In addition, it would be interesting to include external assessments for the measurement of effects in the observation of others, e.g. motivation, endurance and sociability.

13.5 Conclusion

The three presented studies highlight the diverse fields of application of Ambulatory Assessment within occupational rehabilitation. Providing context-sensitive insights into the real-life of occupational rehabilitants and knowledge about proximal stressor-strain relationships (Demerouti & Bakker, 2011), Ambulatory Assessment offers the possibility to derive concrete and specific starting points for organizational improvements. In this context, a main benefit of Ambulatory Assessment is the availability of an estimation for how many occupational rehabilitants such an intervention would be beneficial and on which characteristics of the rehabilitants this depends. Moreover, by Ambulatory Assessment clinicians can get meaningful information about the real-time concerns, problems and needs of occupational rehabilitants beyond clinical settings. This knowledge can be used to support the process of an intervention like training sessions. Finally, the results of the third study also demonstrate that—at least in some cases—Ambulatory Assessment can represent an easy and low-threshold intervention itself by helping occupational rehabilitants to reflect on their experience and behavior and/or by promoting social exchange. Based on these advantages, we suppose Ambulatory Assessment to be a promising approach for aftercare in the period following occupational rehabilitation.

References

Augustine, A. A., & Larsen, R. J. (2012). Emotion research. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 497–510). New York, NY: Guilford.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122–147.

Bandura, A. (1986). *Social foundations of thought and action: a social and cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self-efficacy: the exercise of control.* New York, NY: Freemann.

Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology, 88,* 87–99.

Beal, D. J. (2012). Industrial/Organizational Psychology. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 601–619). New York, NY: Guilford.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: capturing life as it is lived. *Annual Review of Psychology, 54,* 579–616.

Burger, J. M., & Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion, 3,* 381–393.

Caprara, G. V., Steca, P., Gerbino, M., Paciello, M., & Vecchio, G. M. (2006). Looking for adolescents' well-being: self-efficacy beliefs as determinants of positive thinking and happiness. *Epidemiologia e Psichiatria Sociale, 15,* 30–43.

De Jonge, J., & Schaufeli, W. B. (1998). Job characteristics and employee well-being: a test of Warr's vitamin model in health care workers using structural equation modelling. *Journal of Organizational Behavior, 19,* 387–407.

Demerouti, E., & Bakker, A. B. (2011). The job demands–resources model: challenges for future research. *SA Journal of Industrial Psychology, 37*, 1–9.

Eser, K.-H., & Sedlatschek-Dussling, M. (2005). Kompetenzorientierte Fördereffekte rehabilitationsspezifischer Berufsvorbereitung (BvB) bei lern- und mehrfachbehinderten Jugendlichen [Competence-oriented promotional effects of rehabilitation-specific occupational preparation among learning and multiple disabled adolescents]. *Berufliche Rehabilitation, 19,* 227–249.

Fisher, C. D., & To, M. L. (2012). Using experience sampling methodology in organizational behavior. *Journal of Organizational Behavior, 33,* 865–877.

Fleeson, W., & Noftle, E. E. (2012). Personality Research. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 525–538). New York, NY: Guilford.

Giakoumis, D., Drosou, A., Cipresso, P., Tzovaras, D., Hassapis, G., Gaggiolo, A., et al. (2012). Real-time monitoring of behavioural parameters related to psychological stress. *Studies in Health Technology and Informatics, 181,* 287–291.

Hamaker, E. L. (2012). Why researchers should think 'within-person': a paradigmatic rationale. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 43–61). New York, NY: Guilford.

Häusser, J. A., Mojzisch, A., Niesel, M., & Schultz-Hardt, S. (2010). Ten years on: a review of recent research on the job-demand-control(-support) model and psychological well-being. *Work & Stress, 24,* 1–35.

Hektner, J. M. (2012). Developmental psychology. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 585–600). New York, NY: Guilford.

Hofbauer, H. (1977). Verlauf und Erfolg der beruflichen Umschulung bei Rehabilitanden [Process and success of occupational retraining among rehabilitants]. *Mitteilungen aus der Arbeits- und Berufsforschung,* 1, 47–73. http://doku.iab.de/mittab/1977/1977_1_MittAB_Hofbauer.pdf. Accessed 18 Feb 2020.

Jerusalem, M., & Satow, L. (1999). Schulbezogene Selbstwirksamkeitserwartung [School-related self-efficacy]. In R. Schwarzer & M. Jerusalem (Eds.), *Skalen zur Erfassung von Lehrer- und Schülermerkmalen: Dokumentation der psychometrischen Verfahren im Rahmen der wissenschaftlichen Begleitung des Modellversuchs Selbstwirksame Schulen* [Scales for the assessment of characteristics of teachers and pupils: [Documentation of the psychometric measures within the scientific monitoring of the pilot project self-efficacious schools] (pp. 15–16). http://www.psyc.de/skalendoku.pdf. Accessed 18 Feb 2020.

Jimmieson, N. L. (2000). Employee reactions to behavioural control under conditions of stress: the moderating role of self-efficacy. *Work & Stress, 14,* 262–280.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health, 78,* 1336–1342.

Johnston, D., Bell, C., Jones, M., Farquharson, B., Allan, J., Schofield, P., et al. (2016). Stressors, appraisal of stressors, experienced stress and cardiac response: a real-time, real-life investigation of work stress in nurses. *Annals of Behavioral Medicine, 50,* 187–197.

Johnston, D. W., Jones, M. C., Charles, K., McCann, S. K., & McKee, L. (2013). Stress in nurses: stress-related affect and its determinants examined over the nursing day. *Annals of Behavioral Medicine, 45,* 348–356.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: implications for job redesign. *Administrative Science Quarterly, 24,* 285–308.

Karasek, R. A., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristic. *Journal of Occupational Health Psychology, 3,* 322–355.

Lawson, K. J., Noblet, A. J., & Rodwell, J. J. (2009). Promoting employee wellbeing: the relevance of work characteristics and organizational justice. *Health Promotion International, 24,* 223–233.

Luszczynska, A., Gutiérrez-Doña, B., & Schwarzer, R. (2005). General self-efficacy in various domains of human functioning: evidence from five countries. *International Journal of Psychology, 40,* 80–89.

Meschnig, A., Bartel, S., & Kardorff, E. (2015). Individuelle und kontextbezogene Ursachen von Abbrüchen beruflicher Qualifizierungsmaßnahmen. *Rehabilitation, 54,* 184–189.

Michalski, D., Zweynert, U., Küppers-Tiedt, L., & Hinz, A. (2008). Körperliche Beschwerden, emotionale Belastung und Kontrollüberzeugung im Verlauf der orthopädischen Rehabilitation [Physical complaints, emotional distress and locus of control over the course of orthopedic rehabilitation]. *Rehabilitation, 47,* 299–307.

Mitchell, T. R., Thompson, L., Peterson, E., & Cronk, R. (1997). Temporal adjustments in the evaluation of events: the "Rosy View". *Journal of Experimental Social Psychology, 33,* 421–448.

Moraß, A. M., Regensburger, L., Riedl, E. M., Thieme, I., Thomas, J., & Wagner, M. (2018). Selbstwirksamkeitscoaching für Rehabilitanden im BBW: Pilotprojekt [Training of self-efficacy for rehabilitants in German Rehabilitative Boarding Schools: Pilot project]. *Berufliche Rehabilitation, 32,* 322–333.

Nezlek, J.B. (2011). *Multilevel modeling for social and personality psychology.* Thousand Oaks, CA: Sage.

Pavlova, M., Lee, J. C.-K., & Maclean, R. (2017). Complexities of school to work transitions. *Educational Research for Policy and Practice, 16,* 1–7.

Rau, R., Georgiades, A., Fredrikson, M., Lemne, C., & de Faire, U. (2001). Psychosocial work characteristics and perceived control in relation to cardiovascular rewind at night. *Journal of Occupational Health Psychology, 6,* 171–181.

Reid, S. C., Kauer, S. D., Dudgeon, P., Sanci, L. A., Shrier, L. A., & Patton, G. C. (2009). A mobile phone program to track young people's experiences of mood, stress and coping. Development and testing of the mobiletype program. *Social Psychiatry and Psychiatric Epidemiology, 44,* 501–507.

Reis, E. L. (2012). Why researchers should think 'real-world': a conceptual rationale. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 3–21). New York, NY: Guilford.

Riedl, E. M., & Thomas, J. (2019). The moderating role of work pressure on the relationships between emotional demands and tension, exhaustion, and work engagement: an experience sampling study among nurses. *European Journal of Work and Organizational Psychology, 28*, 414–429.

Schmid, R. F., Thomas, J. (2019). Physiologische Aspekte der Achtsamkeit [Physiological aspects of mindfulness]. In Y.-S. Chang-Gusko, J. Heße-Husain, M. Cassens, & C. Schulte-Meßtorff (Eds.), *Achtsamkeit in Arbeitswelten: Für eine Kultur des Bewusstseins in Unternehmen und Organisationen* [Mindfulness in working environments: For a culture of awareness in companies and organisations] (pp. 35–49). Wiesbaden, Germany: Springer.

Schmid, R. F., & Thomas, J. (2020). Teachers' ambulatory heart rate variability as an outcome and moderating variable in the job demands-resources model. *Anxiety, Stress, & Coping, 33,* 387–402.

Schmid, R. F., Dings, W., Thomas, J. (2019). Das Konzept der Achtsamkeit im rehabilitativen Setting [The concept of mindfulness in the rehabilitative setting]. In Y.-S. Chang-Gusko, J. Heße-Husain, M. Cassens, & C. Schulte-Meßtorff (Eds.), *Achtsamkeit in Arbeitswelten: Für eine Kultur des Bewusstseins in Unternehmen und Organisationen* [Mindfulness in working environments: For a culture of awareness in companies and organisations] (pp. 243–256). Wiesbaden, Germany: Springer.

Schwarz, E. L. (2012). Why researchers should think 'real-time': a cognitive rationale. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 22–43). New York, NY: Guilford.

Society for Ambulatory Assessment. (2014). *Ambulatory Assessment: Methods.* www.saa2009.org. Accessed 2 May 2018.

Trull, T. J., Ebner-Priemer, U. W., Brown, W. C., Tomko, R. L., & Scheiderer, E. M. (2012). Clinical psychology. In M. R. Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 620–635). New York, NY: Guilford.

Turner, N., Stride, C. B., Carter, A. J., McCaughey, D., & Carroll, A. E. (2012). Job Demands-Control-Support model and employee safety performance. *Accident Analysis and Prevention, 45,* 811–817.

Wang, A. Y., & Richarde, R. S. (1988). Global versus task-specific measures of self-efficacy. *The Psychological Record, 38,* 533–541.

Warr, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology, 63,* 193–210.

Wilhelm, P., & Schoebi, D. (2007). Assessing mood in daily life: structural validity, sensitivity to change, and reliability of a short-scale to measure three basic dimensions of mood. *European Journal of Psychological Assessment, 23,* 258–267.

Wimmer, E. M., & Thomas, J. (2016). *The buffer-effect of control on distress in three different demand settings: an experience sampling study of the moderating influence of Desire for Control.* Poster session presented at the 50th conference of the German Psychological Society, Leipzig.

Innovation in a Knowledge-Based Economy: Knowledge Transfer in the Health Sector

14

Winand H. Dittrich

Abstract

The aim of this chapter is to conceptualise the term "knowledge transfer" in the light of technological advances and to differentiate between meanings of knowledge transfer in relation to innovation on the one side and knowledge translation on the other side. The new multidimensional lean knowledge-to-action model of organisational knowledge translation is discussed and developed further. Also, factors which seem to hinder knowledge transfer are evaluated. In particular, the phenomenon of organisation silence is highlighted. Furthermore, the text elaborates on factors supporting the exchange of information and translation of knowledge and on the importance of social issues in this context such as researcher-user relations. The role of information exchange and the participation of all stakeholders in occupational rehabilitation, embedded in the health system in Germany, demonstrate the interdependence of different levels of rehabilitation as well as its regulatory frameworks. In this context, a phase model of occupational rehabilitation is described. Finally, knowledge translation seems to function best with a foundation in evidence-based research, transparency, ethical grounding and social consensus.

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14.1 Forms of Knowledge Transfer and the Role of Knowledge Translation

The national institute for public health in Germany, the Robert-Koch-Institute (RKI), has prominently displayed their slogan in all their press meetings during the worldwide Corona crisis in spring 2020: "Evidenz erzeugen – Wissen teilen – Gesundheit erhalten und verbessern". This slogan is highlighting the aims of the RKI for the future, namely "promoting research and evidence, sharing knowledge, protecting and improving health", as explicitly summarised in their strategy paper "RKI 2025" (Robert-Koch-Institut, 2017). One of the main aims in this strategy report is the knowledge transfer in form of new digital databases, new networking options and extending its external communication capacities. These new ways of communication suggest new ways of using the latest IT-developments as well as the latest methods in communication theory and behavioral economics. Key features of the proposed strategy will include the explicit development of a modern communication strategy closely coordinated with the Federal Centre for Health Education (BZgA). Most interestingly, the RKI, explicitly, seems committed to use evidence-based methods for communication and knowledge transfer.

Often, the term knowledge transfer seems to be used in various ways and evidence of the transfer remains unclear. Transfer (lat. transferre "to bring over") is the general transfer of a product (X) from point (A) to point (B). This can be, among others, money transfer transactions between creditor and debtor or a ferry crossing. The process is similar for knowledge transfer. Knowledge is transferred from one employee to another, from the product owner to the project team and so on. However, knowledge exchange goes far beyond the mere transfer of knowledge. In addition to social and moral aspects, the focus is also on communication and knowledge management as well as the development of guidelines (Canadian Institutes of Health Research, 2004). To achieve sustainable effects in knowledge transfer, it is important to understand that the presentation of knowledge alone is not sufficient (Grimshaw et al., 2012; Haynes, 2001). Through research by Landry et al. (2003), it was found that the mere presence of knowledge does not guarantee that it will be used. Thus, unidirectional communication is not effective. In order to increase the acceptance of knowledge, it is necessary to adapt the research results to the needs of the users. This kind of adaptation will be dealt with again explicitly with an in-depth case study in the course of this text (Landry et al., 2003). In the early 2000s, McKibbon and his colleagues (2013) became aware of the misunderstandings and misinterpretations, especially in the medical sector, of undefined concepts in the field of knowledge translation. For the following text, the authors use the term "knowledge translation" of the 127 identified terms for knowledge transfer (McKibbon et al., 2013). For, as already described above, "transfer" does not automatically mean that the knowledge presented is also used (Graham et al., 2006). The Latin translation (transfer, translation) describes more accurately the transfer of knowledge to user groups in terms of adapting it to their needs.

The most successful description for "knowledge translation" comes from the Canadian Institutes of Health Research (CIHR) (2004). Here, knowledge translation is understood from a concept that includes all steps from the creation of knowledge, through implementation, to the assurance of results. CIHR is based on research by Landry et al. (2003) and defines knowledge translation as follows:

> Knowledge translation is the exchange, synthesis and ethically-sound application of knowledge – within a complex system of interactions among researchers and users – to accelerate the capture of the benefits of research [for Canadians] through improved health, more effective services and products, [and a strengthened health care system]. (Canadian Institutes of Health Research, 2004, S. 4)

Twelve of the most important process steps in knowledge translation were developed by McKibbon and his colleagues (McKibbon et al., 2013) in collaboration with the Canadian Institutes of Health Research (Canadian Institutes of Health Research, 2004): the knowledge that needs to be transferred or translated; the necessity of the knowledge; how the knowledge is applied; who receives the knowledge; who has the knowledge; what is important additional information; what skills are needed; what tools are needed to implement the knowledge; what are barriers or facilitators for implementation; what are the results and how can they be measured and how is the project evaluated and monitored.

14.2 Barriers in the Translation of Knowledge

Identifying barriers and eliminating them is an important success factor for knowledge translation. Barriers can be identified using various methods. These include surveys, interviews of individuals, group discussions or observations. As mentioned above, an essential part of the knowledge translation process is to build an understanding that simply presenting knowledge is not enough to ensure that this knowledge is applied correctly or at all. Behavioural adaptation must be actively encouraged and supported. Research by Scott-Findlay and Estabrooks (2006) has shown that certain factors can influence the acceptance of new knowledge. These are organisational complexity, centralisation, size, presence/famousness of a researcher and his/her research area, traditionalism, organisational sag, time, access to and amount of resources, professional autonomy and organisational support (Scott-Findlay & Estabrooks, 2006, p. 209). The aim of knowledge translation in the field of healthcare is to establish and use knowledge from nursing research in practice, for example. In 1997, Grol found out that the willingness to actively change is not based on evidence of the effectiveness of individual theories, but on individual conviction (Grol, 1997). To increase the effectiveness of the implementation of new knowledge, the knowledge to be transferred must be tailored to the needs of the stakeholders. But even if a senior healthcare professional is informed about the latest research findings and considers them to be good (Ajzen, 1991), the

successful adaptation of knowledge can be prevented despite interactions within the team and/or external influences such as time pressure and lack of personnel. Scott-Findlay and Estabrooks (2006) investigated the individual preconditions of nurses to try out a newly tested therapeutic approach. Although they found no clear evidence relating individual preconditions and knowledge translation, they concluded that there must be some connection between personal attitude, education, cognitive flexibility and the successful implementation of knowledge. Testing this hypothetical connection in a study with family doctors, Scott et al. (2008) proved that the acceptance of new knowledge has a lot to do with one's own values and beliefs. If the doctors themselves were not convinced of the introduction of the novel heart health kit for the treatment and prevention of risk patients, they did not hand it over to the patients. In addition, several other factors can prevent the acceptance of new knowledge in the health sector:

- Develop a negative attitude if the benefit and goal are not clear; general disinterest (Rogers, 1995)
- Feel disturbed in their routine (Grol, 1997)
- Do not question their own actions; no ambition to deal with new findings (Davies et al., 2007)
- Influence of age; older people (doctors) are more reluctant than younger ones (Scott et al., 2008)
- Enormous lack of knowledge management skills, ability to read, understand and evaluate research results; no capacity or time to critically examine research results (Ellen et al., 2011; Davies et al., 2007)
- Absence of supportive counselling centres and internal tensions within a team (Davies et al., 2007, pp. 31–32)
- Confusing amount of research results, difficulties to understand or evaluate the results (Grimshaw et al., 2012)
- Results are not always applicable in practice; results are often only insufficiently available to qualified personnel (Kothari & Wathen, 2013)
- Individual actors e.g. family doctors (Scott et al., 2008)
- Return to the usual routine in the absence of support (Grol, 1997)
- Organisational barriers: lack of facilities (organisational), financial barriers (structural), lack of infrastructure, not clearly communicated hierarchy and its responsibilities or standards of practice that are not compatible with the planned change to be implemented (Grimshaw et al., 2012; Davies et al., 2007)
- Lived organisational cultures (Verhezen, 2010)
- Erroneous assumption that no improvement is necessary in the absence of complaints, not admitting the defects unless official, valid data prove otherwise; social desirability (Davies et al., 2007)

Access to sources and research results (e.g. electronic library) as well as the competence to critically evaluate research results independently is extremely important for medical

professionals (Davies et al., 2007). Furthermore, the work climate and culture are essential for either support or hindrance conditions in relation to the success of knowledge translation.

It is to be noted that in case of resistance, two factions of rejection crystallize within the professional staff. The factions differ in their strength of resistance, in "ineffective and useless" and "waste of resources and potentially dangerous". Especially due to the dynamic and fast moving changes within medical research, current knowledge can be outdated within two years. The documentation obligation associated with the innovation and the resulting lack of time are particular hurdles. Especially rare disease patterns are completely excluded from the innovation process, as the circumstances of preparation and follow-up are disproportionate compared to the actual sick patients and thus only unnecessarily block resources (Davies et al., 2007).

In addition, some medical professionals may fear the loss of their professional independence and decision-making power through evidence-based medicine. In particular, the standard of evidence-based methods cannot be integrated into their daily routine due to personnel and organisational barriers and would thus be accompanied by a loss in their relationship with patients and the quality of treatment. Some of the evidence-based methods may be seen as difficult to implement, especially for small companies, because they do not have the technical possibilities or resources. Although evidence-based methods are intended to be a tool for quality improvement, there are strong concerns about whether quality can be maintained in the long term in some organisations. With the introduction of an evidence-based method, the user simultaneously commits himself to be informed about ongoing updates and to implement them promptly, which is hardly possible with limited personnel resources (Davies et al., 2007). However, the importance of evidence-based methods in combination with knowledge translation cannot be overstated, primarily in modern medicine. Evidence-based methods are important to ensure that patients in particular receive the correct treatment based on the latest research (Grimshaw et al., 2012). The development of research-based knowledge and its implementation in practical guidelines or even law during the COVID-19 pandemic in early and mid-2020 can demonstrate the strengths as well as the weaknesses of such an approach. Most likely, a full analysis of this pandemic situation will be needed and, as a consequence, will change our understanding of knowledge translation in the health sector and beyond. One key characteristic of this new pandemic situation seems the greatly compressed timeframe in which knowledge and practical guidelines are constantly changing. Another crucial feature for a new understanding of knowledge translation seems the remarkable role the mass media and online media are given not only by the public but also by the researchers themselves (e.g. Barnes, 2020; Chan et al., 2020; Gottlieb & Dyer, 2020; Goel & Gupta, 2020; Hamid, 2020; Lavis et al., 2003). As the time between evidence, knowledge translation and decision making is of utmost importance in the pandemic, the question arises whether the COVID-19 pandemic has fundamentally changed our understanding of knowledge translation or, alternatively, has brought to the foreground some crucial features of otherwise well-established models of

knowledge translation (see below). Will this pandemic be seen as the final breakthrough of adaptive evidence-based medical practise and policy making?

The quality and responsibility in respect to knowledge translation are assessed differently by different professional groups. According to Davies, Powell and Ruschmer (2007), doctors, for example, tend to see the responsibility for change in themselves rather than in management. In this context, management does not have the necessary foresight for physicians to evaluate and implement changes. This holds a great potential for conflict when changes are decided and introduced by management. Particularly with regard to quality measurements, physicians fear that management will misuse them to reduce costs and cut jobs. Is the quality claim that the manager has the same quality claim that a doctor may have against his patient? Quality-based measurements are critically assessed by employees, there is concern that the measurements are erroneous and do not reflect the actual status. Especially the publication of quality-based data and its further processing by management is not effective for many users and they fear negative consequences. By quality, the manager could mean, for example, treatment with little time (cost savings, efficiency), low use of consumables (cost savings, efficient use of resources, waste avoidance) and standard diagnostic procedures (tested diagnosis, comparable treatment). In return, these very management assumptions could prevent a physician from meeting his or her own quality standards by taking time for the patient and possibly deviating from the standard procedure in order to provide the patient with a better and perhaps more efficient therapy. However, as soon as the physician deviates from the standard procedure, his or her treatment would no longer be measurable according to the criteria of quality standards, since there are no key data for measurement compared to the standard procedure. In the case of a translation of knowledge that brings about an improvement in quality, the question now would be for whom would it be an improvement and how would it be measured? This raises the question of what could be used as an indicator of quality. Results are a good basis for the assessment of quality, yet results also primarily reflect the ability of the treating physician. Nevertheless, is not every result the best result for the patient? If survival has been defined as an outcome goal, but it is accompanied by severe limitations in mobility and loss of quality of life, the outcome is not desirable and does not testify to qualitative medicine.

Furthermore, it is questionable whether medical care could not also be recorded as a quality feature. This would include anamnesis, interactions between patients and doctors, general care measures and the like. Also the general Hospital equipment and its use can be made a quality feature. Diagnosis reports are undoubtedly a characteristic with which the quality of a hospital can be checked, especially, when errors occur in diagnosis and patient treatment. Nevertheless, the physician's performance can still be judged as being good if the treatment strategy can be proven to be logical regardless of whether his or her diagnosis is based on the most recent, valid research data (Donabedian, 2005), which subsequently raises the question of whether performance should be judged based on records or on direct care performance.

Scott-Findlay and Estabrooks (2006) found that knowledge is not always used in the same way in the company, but varies from one occupational group to another. Doctors, for example, have a verbal, scientific communication when it comes to innovations. Nurses, on the other hand, communicate innovations in a more practice-oriented way and "on the job". They also found that there were also differences in the use of knowledge within the employed nurses in terms of position and role. What is particularly striking is that they found no evidence that, in contrast to the literature, lack of time prevented nurses from using research knowledge. They described that a high workload may even be a reason for the need to use research knowledge.

The development of guidelines in daily use could be beneficial in practice. However, many users criticise the guidelines as too rigid and outdated too quickly. Interestingly, Davies, Powell and Rushmer (2007) found that there were differences in the use and adherence to the guidelines. Nurses are more willing to follow the guidelines than doctors are. The use of guidelines also requires a defined framework that ensures that they are up to date and can be implemented in the daily routine by the staff (Davies et al., 2007). Therefore, the difficulty remains in establishing guidelines in a way that all professionals can identify with them.

14.3 Organisational Knowledge Translation

Knowledge to Action Loop

To talk about knowledge transfer models, Graham et al.'s "Knowledge-to-Action" framework (see Fig. 14.1) is probably the most common. With their model, Graham et al. (2006) managed to transcribe the intangible process of knowledge translation into a generally understandable process. Essentially, the model consists of two independent, separate processes, which are nevertheless conditional on each other. This offers the advantage that two teams, for example in the form of working groups, can focus on knowledge creation on the one hand and on knowledge implementation on the other. In the action phases, individual steps can be carried out either sequentially or simultaneously. The first step in the Knowledge-to-Action framework is that the breadth of existing knowledge ("Knowledge Inquiry") is reduced with the help of Knowledge Synthesis into useful, valid and implementable knowledge ("Products and Tools") that is tailored to the specific needs of the users. Due to the possible multidirectional communication, both working groups can communicate and act with each other at any time in order to adapt the knowledge as much as possible. The subsequent action cycle determines the course of the knowledge implementation. The predominant problems of an institution are identified and suitable, valid pre-selected knowledge is matched with regard to validity and usefulness ("Identify, Review, Select Knowledge"). In the case of suitable knowledge that is not transferable to practice, this is called a knowledge-to-action gap (Graham et al., 2006). Concentrating on the point "Adapt Knowledge to Local

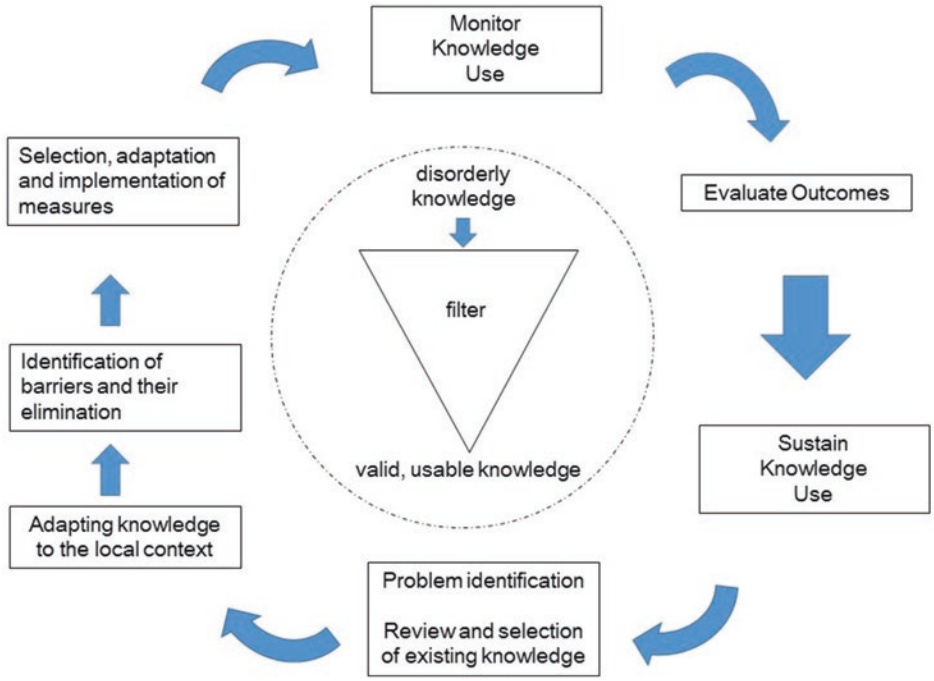

Fig. 14.1 Knowledge-to-Action-Loop (*Source* Modified after Dittrich and Schulz 2020, p. 237)

Context" knowledge is specifically adapted to understanding and needs (Grimshaw et al., 2012). Then knowledge translation barriers identified are assessed and measures taken ("Asses Barriers to Knowledge Use"). With a strategy transfer process ("Select, Tailor and Implement Interventions") knowledge can be successfully placed in the company. During the "Knowledge Use Monitor", the success of the implementation is checked and, if necessary, readjusted. The monitoring helps to differentiate whether, for example, users are not interested, new barriers have opened up or barriers beyond their own control are blocking the implementation of the knowledge. If this is not the case, the "Evaluate Outcome" can be used to assess the results achieved. During "Sustain Knowledge Use", the use of the knowledge is maintained and scanned for new barriers or strategy adjustments. The advantage of Graham et al.'s Knowledge-to-Action Framework is the parallel running processes, which are interlinked. Thus, feedback can be absorbed at an early stage and strategies for reducing barriers can be developed (Graham et al., 2006).

Graham et al.'s framework served as the basis for further developing a two-stage process of knowledge translation. Dittrich and Biniok (2018) modified Graham's model for better transferability to the economy (see Fig. 14.2). Significant changes were made primarily in the second process step. Here, Dittrich and Biniok (2018) focused on the

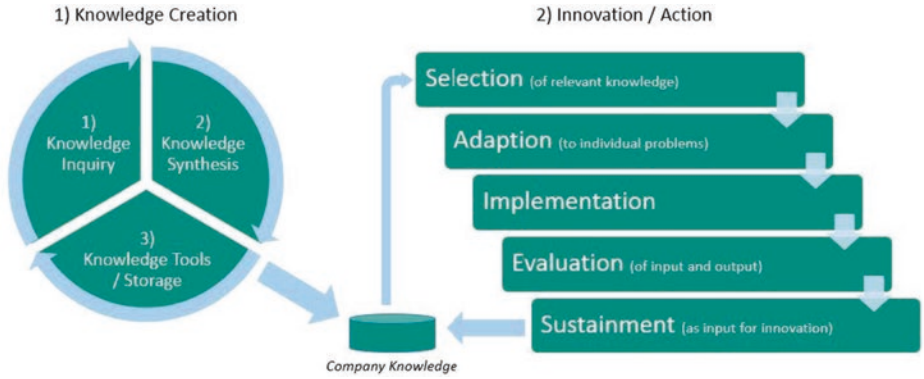

Fig. 14.2 Lean Knowledge-to-Action Model (*Source* Dittrich and Biniok 2018, p. 240)

storage of knowledge and knowledge instruments in an economic context. In their Lean Knowledge-to-Action model, it is continuously possible to store and reassess knowledge after implementation and problem solving. This opens up new possibilities for adapting and implementing ideas and evaluating them, since this knowledge can be stored as innovation and action and thus made available to other stakeholders. Especially with regard to economic efficiency and quality assurance, it is necessary to check continuously the implemented knowledge and to evaluate it with regard to maintenance or rejection. By preserving knowledge, by means of storage, this simplifies the further use of the knowledge already used and serves as a basis for further knowledge translations. Strategy-oriented knowledge management is an important additional aspect of the overall strategy.

Dittrich and Schulz (2020) relied on this already further developed Lean-Knowledge-to-Action model and supplemented it with a multifunctional component (see Fig. 14.3). The focus here is on the already existing preconditions of the organisation. Thus, Graham et al.'s focus on what knowledge is available was redirected to the conditions of the organisation as a starting point. Cultural norms and guidelines, previous practice, innovative ability, needs and problems create the basis for the knowledge creation process. Dittrich and Schulz (2020) have also incorporated Roger's (1983) five criteria for new knowledge to solidify its acceptance. As an indispensable prerequisite, new knowledge must have a specific benefit that is visible to the user and thus a relative advantage. Furthermore, other factors such as compatibility of the knowledge with the user's existing values, a healthy complexity, testability and observability are necessary (Rogers, 1995). By integrating a knowledge broker (knowledge mediator/change agent), the acceptance of the user groups can also be increased (Glegg & Hoens, 2016). Furthermore, Rogers (1983) has anchored a five-step plan in his innovation diffusion theory, which also promotes the adaptation of new knowledge (see Figs. 14.4 and 14.5). According to Rogers (1983), (1) knowledge (preservation of knowledge), (2) persuasion (decision whether this knowledge is convincing), (3) decision (decision) (acceptance or

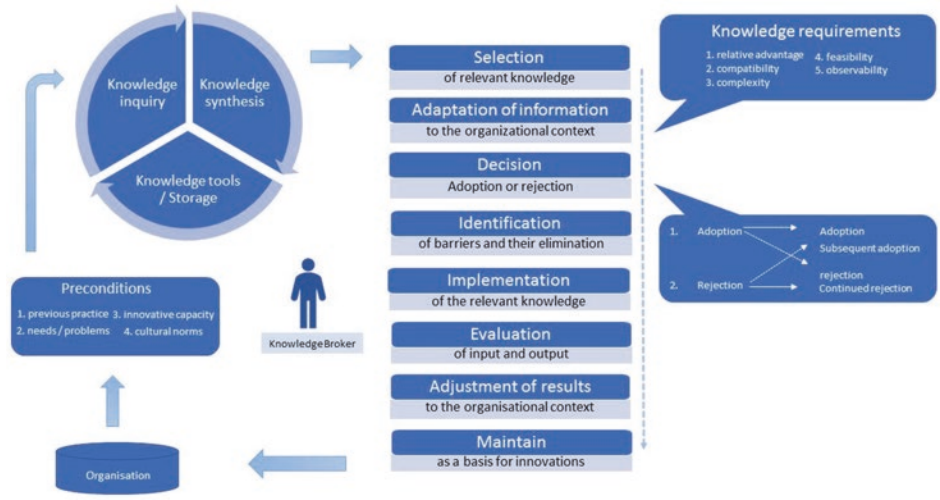

Fig. 14.3 Multidimensional Lean Knowledge-to-Action Model (*Source* Modified after Dittrich and Schulz 2020, p. 244)

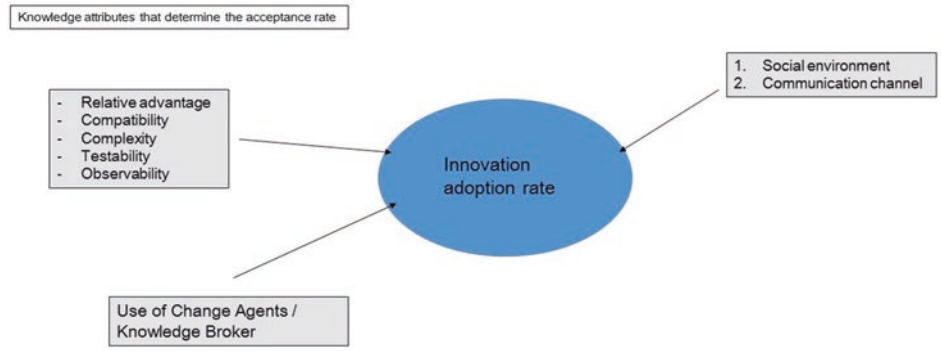

Fig. 14.4 Aspects for Determining the Adoption Rate according to Rogers (*Source* Modified after Dittrich and Schulz 2020, p. 241)

rejection), (4) implementation (implementation of knowledge and, if necessary, adaptation) and (5) confirmation (retention of knowledge, adaptation or rejection) are also important criteria for the acceptance of new knowledge.

In highlighting the various stages of knowledge translation with a special emphasis on the two aspects of knowledge creation and acceptance in the multidimensional lean knowledge-to-action model (Dittrich & Schulz, 2020) recent developments in health-related knowledge translation driven by the World Wide Web can be appreciated more fully. The multidimensional lean knowledge-to-action model is based on a holistic

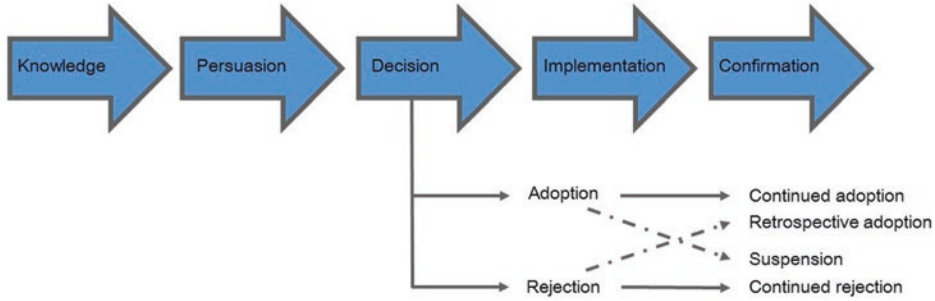

Fig. 14.5 Aspects of Innovation Diffusion Theory (*Source* Modified after Dittrich and Schulz 2020, p. 240)

approach pointing to all aspects of knowledge management that pertain to knowledge translation activities (e.g. generation, storage, distribution, application and so forth) as well as managerial levels (e.g. strategic, operational levels). Health-related data services and systems either closed professional or open public ones, of unprecedented qualities foster collaborative work among health experts, allow users to raise their voices, allow participation in the development of content, and enable new forms of communication among participants. For example, blogs, wikis, social networks and, more recently, blended systems (i.e. combining the various web-based technologies in a single system) are collaborative technologies, which, finally, will not only be combined but integrated in a consistent environment to allow for synergetic effects in knowledge management (Fichter, 2005). One major challenge will be not only to make use of explicit relations (such as the names of products or the names of people individuals meet closely as in the COVID-19 app) but also to be able to infer implicit linkages among information units and make them accessible (risk of COVID-19 infections among people met in public places).

It is the context and the context-related association of data that makes their interpretation possible and, thus, transfers the same data into information units. This kind of transfer is the aim and great strength of big data. Furthermore, linking information units to specific human actions can be seen as the basic process of knowledge generation. In such a way, implicit knowledge which otherwise might be lost is preserved and exchanged. A holistic approach, as suggested here, has enormous consequences for the communities in relation to knowledge translation in the health sector in general. Holistic approaches are defined by the combination of both technical and human aspects of knowledge management. With modern IT-technologies and big data approaches our notion of implicit knowledge as human factor, especially cognitive and emotional facets, transcends the level of tacit knowledge as described by Nonaka and Takeuchi (1995). They, rightly, draw attention to the role of tacit knowledge as the innate, hard-to-communicate skills of practical knowledge, in psychology sometimes also referred to as implicit memory.

Nevertheless, Nonaka and Takeuchi's (1995) use of tacit knowledge seems highly undefined and vague (e.g. McAdam & McCreedy, 1999). Furthermore, nowadays implicit knowledge encompasses much more than these rather practical aspects of using our motor system or movements as stored in memory. Here, information implicitness refers to all relationships or connections between information units which are not directly accessible but only available through mediated or 3rd party indirect links, for example, if the mood of a user is inferred through the writing style or word use in emails or search histories. Hence, not only texts or images but also more abstract data such as the identity of users or their well-being in a social network or in occupational rehabilitation setting can directly be communicated (e.g. Novak & Wurst, 2004). Therefore, in finding indirect connections among information units users' relationships in networks, the data they produce and the information they search for can be analysed and visualised. Finally, making use of semantic information will go a long way to meet the challenge of preserving and transferring rsp. translating implicit in addition to explicit knowledge in the health sector. To support knowledge translation from research to evidence-based practise new ways of transferring information and knowledge using new technologies are required. For example, direct communication with the stakeholders or support through journalism rsp. media may allow new forms of knowledge marketing by using digital tools (Dittrich, 2017). Such a rather new approach to interlinking economic and psychological levels in respect to communication strategies rsp. knowledge translation, for example in the finance sector, has been highlighted and captured in Dittrich and Wohlmann's model of communication between the central bank and markets (2018; 2020). This model emphasizes that, as human beings have a limited capacity and variable readiness to absorb knowledge, the recipients of the information play a central role in determining what information actually reaches them. Appropriate information exchange that takes such obstacles, as e.g. selective attention and, generally, recipients' psychology, into account can thus significantly increase the efficiency of knowledge translation. To develop new and acceptable ways of knowledge translation it seems essential to agree on social norms and rules among all stakeholders. Before solving the highly complex technological and ethical challenges of implicit knowledge management in the next decades there are some hurdles to knowledge translation to consider more closely in the immediate future.

14.4 Organisational Silence

Organisational silence occupies a special position among the barriers that can arise during a knowledge translation process, as it sometimes causes the most damage within organisations (Donaghey et al., 2011; Rezabeygi & Almasi, 2014). Organisational silence is a conscious communicative decision of an employee not to want to speak. What makes employees not want to communicate? Often it is particularly fears that cause employees to be silenced. They fear punishment or loss of their professional reputation. However, there are also cases of internal stress, in which employees feel it is

pointless to communicate; perhaps they have lost confidence in their management. In addition, employees increasingly fall into a kind of indifference to actively participate in the company's affairs. They do not feel that their opinions and ideas are valued and tasks are only half-heartedly completed.

Rezabeygi and Almasi (2014) have established three categories of employee silence. One is the submissive silence, the employee is afraid to speak in public, he fears that he will not be taken seriously and wants to give the impression that he is satisfied with the current situation. Regarding defensive silence the employee is afraid of confrontation and protects himself against attacks by the silence. This particularly affects insecure employees who are worried about their personal professional status. As well as the friendly silence, the employee consciously withdraws in order to make other employees listen to him in order to be able to take advantage of it if necessary. Particularly offensive behaviour by superiors can encourage organisational silence. This occurs comparatively frequently in a "top-down" organisational culture (Vakola & Bouradas, 2005). Organisational silence can also be of organisational origin. Among other things, employees are afraid of their managers or supervisors, they fear losing their job or being demoted. Unexplained structures within the hierarchy and invisible responsibilities can reinforce the silence, especially, if no monetary or professional incentives are created for commitment. When employees are affected by silence, whether it is organisational or moral silence, this silence causes stress, dissatisfaction and in the worst case depression in the long run (Rezabeygi & Almasi, 2014; Vakola & Bouradas, 2005). It is precisely for this reason that it is particularly important that companies pay attention to open and trusting communication within their company. Through open communication, measures can be taken in advance before abusive internal processes are discovered too late and become harmful (Donaghey et al., 2011).

14.5 Support Systems of KT

Researcher-User Relations

A close and professional relationship between researchers and users helps to translate new knowledge into everyday practice. Only in this way can organisational barriers be clarified in advance and the responsible researchers get a feel for how the company works. Complex systems in particular should be the subject of research before implementing an innovation. This is the only way to ensure that the strategies for implementation can be adapted to the needs of the systems and individuals (Ghate, 2016). The Canadian Institute of Health Research defines the knowledge sharing process as a dynamic and highly complex interaction between researchers and users (Canadian Institutes of Health Research, 2004). Landry et al. (2003) have introduced a new variable in this respect, the linkage mechanisms. The more linkages researchers and users have and invest in these linkages, the higher the acceptance and use of knowledge by users. For a better and increased innovation output, even Kothari and Wathen (2013)

recommend an active cooperation between research and users. They believe that a higher acceptance of "foreign knowledge" in practice can be achieved if the end user gains an understanding of the working process of science. Therefore, it is necessary to intensify the relationship between researchers and research users. A relationship based on proximity and connectedness between researchers and knowledge users can be conducive to the adoption of knowledge (Landry et al., 2003; Grimshaw et al., 2012). Furthermore, the organisational structuring of knowledge as a success factor has proven a main focus. End users have difficulties in communicating with researchers and often do not communicate at the same level. This is especially true when results are presented in language that is not understandable, results are not clearly presented and the dissemination effort is too high (Landry et al., 2003). In order to improve acceptance of the results, research and scientific reports should be made more attractive and easier to understand, which will increase user acceptance. If, in addition to comprehensibility, the needs of the users are also perceived and the results appear relevant and credible to the users, acceptance and adoption in practice is more likely (Landry et al., 2003). Working together with research questions can positively influence the dynamics of research. Early involvement of research users may even lead researchers to reinvent research that they thought had failed and to continue working on it until the desired results are evident (Kothari & Wathen, 2013; Spiel et al., 2016).

Dobbins et al. (2007) examined the question of what demands and needs decision-makers and researchers have to meet. In a study with three organisations (Children's Treatment Centres of Ontario (CTCs); Ontario Community Care Access Centres (CCACs); and District Health Councils (DHCs)), CEO/managers, executives, senior clinicians, and health planners, among others, were asked about perceived barriers to knowledge transfer from research to practice and demands on the content of the knowledge to be communicated. Spiel et al. (2016) argued for a systematic integration of intervention and implementation research and recommended to use a field-oriented and participative approach including the perspective of policymakers.

In addition to the classical barriers such as lack of time, lack of understanding and critical discussion skills, organisational and personal barriers such as lack of structures and competencies as well as resistance to new ideas were also mentioned. This led Dobbins et al. (2007) to the conclusion that the involvement of decision-makers has a positive influence on the acceptance of new knowledge. In the survey, the study participants named in particular four suitable media for knowledge transfer. Summaries/abstracts in scientific journals are usually preferred to the original full texts. Furthermore, websites, e-mail and workshops (partly conferences) were mentioned. This leads to the conclusion that the needs and resources of decision makers are the benchmark for the design of research results.

CanChild (Centre for Childhood Disability Research/McMaster University) confirms this assumption. In a literature review in cooperation with the CTCs, they drafted a model for the requirements of knowledge transfer. The knowledge to be transferred must meet the following requirements: the scientifically valid content must be classified as useful for the user. Furthermore, the content must appear credible and competent.

When choosing the transfer medium (abstract, website, e-mail etc.), care must be taken to ensure barrier-free access and comprehensible language (Dobbins et al., 2007). Generally, it can be concluded that the joint effect of several determinants of knowledge transfer contributes to the degree of knowledge transfer (e.g. Minbaeva, 2007): characteristics of knowledge, characteristics of both senders and receivers, and the relationships between them.

14.6 Occupational Rehabilitation – A German Perspective

A phase model of rehabilitation as recently suggested and partly implemented in German is described as it seems to demonstrate various aspects of successful knowledge translation. Before discussing the phase model in more detail some background information about the rehabilitation situation in Germany is provided. Besides the well-known health and pension insurance in Germany, there is a third already older insurance, the statutory accident insurance (GUV). In most cases, the costs of accident insurance are borne by the employer. Accident insurance always takes effect where potential dangers for the well-being of employees lurk. It does not only come into effect when it is already too late, but protects employees (and beyond, e.g. family and employers) from the dangers of an accident in advance. The importance of prevention is explicitly regulated in the social security statutes ("Sozialgesetzbuch", see §§ 20 SGB V). The health insurance system focuses on four core tasks: (a) prevention, (b) rehabilitation, (c) medical treatment and (d) health care management. In addition to prevention, the GUV also focuses on restoration (rehabilitation) and compensation (for an overview see: Lukasczik et al., 2011; Linden, 2014). In general, however, all measures for restoration must be taken before compensation is paid. The measures taken must be sufficient, appropriate and economical, according to a subsidiary agreement of the statutory health insurers. The structure of the GUV increasingly relies on patients receiving services bundled from corresponding partners and thus moving within a network. The GUV is striving to establish its own trauma rehabilitation network based on the model of the trauma network of the DGU (German Society for Trauma Surgery). In addition, suitable rehabilitation procedures were defined and described in a manual to ensure uniform treatment of patients (Müller, 2015; Auhuber et al., 2017; Simmel et al., 2017).

The aim of this development was the comprehensive measurement of success for applied therapy methods in terms of the BGSW (Berufsgenossenschaftliche Stationäre Weiterbehandlung) Reha-Management procedure and the co-development of a job-related musculoskeletal rehabilitation (ABMR). A new phase model of occupational rehabilitation has been proposed (Müller, 2015) and in some rehabilitation areas been implemented (e.g. Müller et al., 2018). This model is based on the action guideline for a uniform overview of rehabilitation management developed in 2010 by the DGUV (German Social Accident Insurance), which serves as a support for all stakeholders working together in rehabilitation cases, the classes SAV (severe injury type procedure) and VAV (injury type procedure) (e.g. Auhuber et al., 2017).

The general goal of rehabilitation seems the fastest possible and extensive reintegration into social and professional life. For a long-term implementation and success assurance, four basic modules are essential in the new phase model (see Müller, 2015; Auhuber et al., 2017):

1. Patient-related assessment instruments
2. Workplace-related test and therapy elements
3. Conducting case conferences
4. Annual result reviews

(1) Patient-related assessment instruments: By using paper-related assessment instruments (PROs – Patient Reported Outcomes), barriers and/or success preventers of the measures can be found with the help of the patients already in the run-up to the therapy. In addition, the therapy requirements found can thus be raised to a higher level of professional integration conditions, far away from mere medical examinations. In this way, further necessities in the professional activity environment and in the consideration of the therapy plan become visible. Furthermore, the results can be used for cost plans and/or therapy extensions. By involving the patients, it is possible to assess patient motivation and commitment in advance.

(2) Workplace-related test and therapy elements: An individually adapted job-related requirement profile is an advantage for the chances of success for a successful professional rehabilitation of a patient. Through the use of ABMR instruments (requirement profile from the employer, test procedures, workplace inspection, etc.), individual, workplace-related problems can be addressed and included in the therapy plan, thus enabling the therapeutic goal of reintegration to be achieved more quickly. The first step is to determine the job requirements profile. This is usually prepared by the employer and should be available before the therapy plan is drawn up. For a better integration of the requirements, a standardized method is recommended. The next step is to determine the job-related skills profile. This is done, among other things, by interviewing patients about their general activities and, in addition to clinical diagnostics, by recording all the patient's injury-related disorders. In the third step, the profile comparison, all requirements found are compared with the patient's existing deficits. The individual, work-related therapy plan results from the profile comparison. After completion of the rehabilitation therapy, the success of the therapy can be checked with regard to the work-related patient profile by evaluating the performance (e.g. EFL according to Isernhagen (1992) or WORQ according to Finger et al. (2014). An overview of approaches based on functional capacity evaluation can be found e.g. in Escorpizo et al. (2016), De Baets et al. (2018), regarding knowledge translation Halar et al. (2020) or in cases of the elderly Wong et al. (2020). The relative advantage of such approaches is a condition for the acceptance of new knowledge (see above). The rehabilitant must perceive a (relative) advantage in the measures for himself and his early reintegration into the work process. Especially by using workplace-related content, the patient can be convinced of the

usefulness of the applications and thus the motivation for successful participation in the rehabilitation can be increased.

(3) Conducting case conferences: During or at the end of a therapy plan, case conferences should definitely be held. All stakeholders (patient, rehabilitation manager, attending physicians, etc.) discuss the current course (case conference) and, if necessary, adjust goals and procedures, or draw a summary of the therapy that has taken place (final case conference).

(4) Annual result reviews: Once a year a retrospective feedback session should be scheduled together with the management of the accident insurance companies (UV), with the consulting UV doctors and the BG doctors of the respective clinic. Here, completed cases are evaluated with regard to prediction of the ability to work, success of the therapy and reintegration. The annual review has shown that the all-encompassing analysis of the cases of the past calendar year is an important characteristic of quality assurance. In particular, the exchange with staff from outside the clinic offers benefits.

The development of treatment standards and the merger of service providers into a trauma rehabilitation network seems highly recommendable and has proven successful to ensure and expand excellent quality standards (Kladny, 2011; Debus et al., 2014; Müller et al., 2018). At present, no uniform rehabilitation measures have been developed. Due to the complex severity of the individual cases, it has not yet been possible to develop a comprehensive rehabilitation model that is adapted in all circumstances. Nevertheless, the partial implementation of the rehabilitation phase model and integrating occupational rehabilitation in a trauma network have been a success and have led to improved outcomes regarding the situation in Germany.

One specific area of knowledge transfer is the topic of how to deal with the situation of being ill. Of course, the usual routines of seeing a doctor and following the medical advice seem most obvious. However, there is a large grey zone of indecisiveness and uncertainty when people are confronted with decisions about their own feeling of sickness. A formal as well as an informal approach to this problem are discussed here. Starting with the latter approach, since the 1990s it has become obvious that not only absence from work due to illness is a problem for productivity but also the newly described phenomenon of sickness presenteeism (Aronsson et al., 2000). Sickness presenteeism (SP) refers to the behavior of going to work despite illness. Findings indicate that SP can be related to serious health problems at a later stage (Gustafsson & Marklund, 2011) and that several episodes of SP during the previous year are a risk factor in later years (Bergström et al., 2009). When investigating the consequences of SP on the productivity of American organisations it was found that SP causes much more aggregate productivity loss than sickness absence (Collins et al., 2005) and that managing SP more effectively could become a competitive advantage (Hemp, 2004). The reasons for SP seem not only manifold but vary also from country to country. Despite

a low response rate, not surprisingly in such a sensitive matter, Johansen et al., (2014) investigated the main reasons for absence: 56% of the Norwegian and Swedish respondents experienced SP in the previous year. The most frequently reported reasons for SP include the wish not to burden colleagues (43%), the fact that one enjoys work (37%) and the feeling of being indispensable (35%). Compared to Swedish respondents fewer Norwegians state that they cannot afford taking sick leave, while more Norwegians refer to the fact that they enjoy their work. Women and young workers more often report that they do not want to burden their colleagues. Managers, highly educated persons and the self-employed more often report that they are indispensable. It may well be difficult to draw firm conclusions about the validity and reliability of the study but it seems undisputed that beside the obvious factors such as financial and social security system ones there are various highly personal reasons for SP. In this sense, the knowledge translation in public health education remains an important aim but the whole approach remains rather informal as it largely depends on the individuals' responsiveness.

A more formal approach for knowledge transfer has been taken by the RKI in the 1980s and 1990s when dealing with HIV infections and AIDS. As early as 1981 the RKI was at the forefront when informing the public about the epidemic (Hamouda, 2003). Other governmental bodies were informed and instigated to act. From 1982 onwards AIDS cases were actively looked for and investigated. An information sheet for the public and for those most at risk about the illness and health promotion activities was published and constantly updated depending on the latest research. From 1983 onwards the RKI took over as the funding body for all governmentally funded research projects related to AIDS. First health models for public education were developed and nationwide implemented since 1985. In the spring of 1987 an AIDS Center was planned as part of the RKI and opened in early 1988. As main aims of the Center the following ones can be highlighted:

- Policy consultancy on issues related to HIV/AIDS
- Clearing center for epidemiological issues
- Collection and evaluation of clinical studies
- Virological and molecular research about diagnostics and pathogeny of HIV infection
- Psycho-social research related to HIV/AIDS
- Documentation and information materials with a focus on education
- Funding body for all governmentally funded research projects related to HIV/AIDS

In this respect, the AIDS Center of the RKI was founded as the major hub of knowledge transfer and leading the formal approach to research and education related to HIV/AIDS in Germany. Similarly, in the Corona/Covid-19 crisis in spring 2020 the RKI was the leading national institute for collecting information and publishing national statistics on the pandemic in Germany.

Finally, recent developments clearly point in the direction that quite different factors and therapeutical practises seem to contribute to the success in occupational rehabilitation. Because of the complex nature of injuries at work, confounding socio-economic factors (e.g. the job market, individuals' histories), variability of treatment and management protocols across countries as well as heterogeneity in the intervention populations it is not surprising that various rehabilitation models have been adopted instead of one commonly accepted model everywhere. Therefore, this variability in rehabilitation requirements can be seen as an important driver of knowledge translation to ensure up-to-date best practice and latest research-based information. At least, the following common factors might be highlighted, here: importance of therapy intensity and occupation-based activities based on active participation of the user, provision of cognitive and emotional training facilities, overarching knowledge translation centers and/or networks, integration of therapeutical and non-therapeutical measures in comprehensive rehabilitation programs guided by multidisciplinary teams.

14.7 Conclusion

In a knowledge-based economy the management of knowledge information is dependent on a multidimensional set of technologies, norms and practices. To optimize knowledge translation for all the qualitatively different aspects in the health sector a guiding role of health management is crucial. The effective sharing and translation of knowledge requires a clear and acceptable knowledge strategy based on a theoretical framework. This paper focused on such a theoretical framework and discussed various stages and ideas for such a model and, thus, for providing guidance for a holistic management of knowledge. The multidimensional lean knowledge-to-action model, as described here, specifies important steps and phases of knowledge creation and translation. At the same time preconditions and acceptance criteria are considered. The characterisation and elaboration of common understanding for knowledge translation in the health sector seems a shared task of both researchers and practitioners. The interactions between the different parties and organisational structures for knowledge translation and dissemination should be considered in future studies for a more mature rehabilitation scheme in order to fulfil the expectations they have raised. The establishment of successful and more efficient rehabilitation schemes can only be achieved by joint efforts of all stakeholders involved that compile the commonalities of evidence as shared through knowledge translation. One particular aspect which has proven more and more important in the rehabilitation sector has been the intercultural applicability of rehabilitation procedures. Knowledge translation and rehabilitation practices take place and are rooted in a specific cultural context. Innovation and knowledge management has been largely viewed through the lens of industrialized nations. There seems to be a need to understand knowledge translation outside of Japan and the Western world.

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References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50,* 179–211.

Aronsson, G., Gustafsson, K., & Dallner, M. (2000). Sick but yet at work. An empirical study of sickness presenteeism. *Journal of Epidemiology and Community Health, 54,* 502–509.

Auhuber, T. C., Reimertz, C., Müller, W. D., & Hoffmann, R. (2017). Neuausrichtung der Heilverfahren der gesetzlichen Unfallversicherung. *Die Rehabilitation, 56*(01), 55–72.

Barnes, S. J. (2020). Information management research and practice in the post-COVID-19 world. *International Journal of Information Management*, 102175.

Bergström, G., Bodin, L., Hagberg, J., Aronsson, G., Josephson, M., Bergström, G., et al. (2009). Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *Journal of Occupational and Environmental Medicine, 51,* 629–638.

Canadian Institutes of Health Research. (2004). *Knowledge translation strategy 2004–2009: innovation in action.*

Chan, A. K., Nickson, C. P., Rudolph, J. W., Lee, A., & Joynt, G. M. (2020). Social media for rapid knowledge dissemination: early experience from the COVID-19 pandemic. *Anaesthesia*, 12, 1579–1582.

Collins, J. J., Baase, C. M., Sharda, C. E., Ozminkowski, R. J., Nicholson, S., Billotti, G. M., et al. (2005). The assessment of chronic health conditions on work performance, absence, and total economic impact for employers. *Journal of Occupational and Environmental Medicine, 47,* 547–557.

Davies, H., Powell, A., & Rushmer, R. (2007). *Healthcare professionals' views on clinician engagement in quality improvement: a literature review.* The Health Foundation.

De Baets, S., Calders, P., Schalley, N., Vermeulen, K., Vertriest, S., Van Peteghem, L., et al. (2018). Updating the evidence on functional capacity evaluation methods: a systematic review. *Journal of Occupational Rehabilitation, 28*(3), 418–428.

Debus, F., Ruchholtz, S., & Kühne, C. A. (2014). Rehabilitation of severely injured patients in TraumaNetwork DGU. *OUP, 11,* 508–511.

Dittrich, W. (2017). Business intelligence als navigator. *HR Performance, 2*(2017), 58–59.

Dittrich, W., & Biniok, M. (2018). Knowledge transfer as driver for innovation culture in heterogeneous economic zones. In F. Bakirci, T. Heupel, O. Kocagöz, & Ü. Özen (Eds.), *German-Turkish Perspectives on IT and Innovation Management* (pp. 229–246). Wiesbaden: Springer Gabler.

Dittrich, W., & Wohlmann, M. (2018). Effizientere Geldpolitik durch bessere Kommunikation? In M. Seidel (Ed.), *Banking & Innovation 2018/2019* (pp. 195–213). Wiesbaden: Springer Gabler.

Dittrich, W., & Schulz, T. (2020). Entscheiden bei Unsicherheit. In R. Buchkremer, T. Heupel, & O. Koch (Eds.), *Künstliche Intelligenz in Wirtschaft & Gesellschaft* (pp. 231–247). Wiesbaden: Springer Gabler.

Dittrich, W.H., Wohlmann, M. (2020). Hurdles and obstacles in monetary policy communication. A model for the communication between the Central Bank and markets. *Economics of the 21st Century,* 23. https://dbc.wroc.pl/Content/110025/Dittrich_Wohlmann_Hurdles_and_obstacles_in_monetary_policy_communication.pdf. Accessed 26 Apr 2021.

Dobbins, M., Rosenbaum, P., Plews, N., Law, M., & Fysh, A. (2007). Information transfer: what do decision makers want and need from researchers? *Implementation Science, 2*(1), 20.

Donabedian, A. (2005). Evaluating the quality of medical care. *The Milbank Quarterly, 83,* 691–729.

Donaghey, J., Cullinane, N., Dundon, T., & Wilkinson, A. (2011). Reconceptualising employee silence: problems and prognosis. *Work Employment Society, 25,* 51–67.

Ellen, M. E., Lavis, J. N., Ouimet, M., Grimshaw, J., & Bédard, P.-O. (2011). Determining research knowledge infrastructure for healthcare systems: a qualitative study. *Implementation Science, 6,* 60.

Escorpizo, R., Finger, M. E., & Reneman, M. F. (2016). Integration and application of the International Classification of Functioning, Disability and Health (ICF) in return-to-work. In I. Z. Schultz & R. Gatchel (Eds.), *Handbook of Return to Work* (pp. 99–118). New York: Springer.

Fichter, D. (2005). The many forms of e-collaboration: Blogs, wikis, portals, groupware, discussion boards, and instant messaging, *29,* pp. 48–50.

Finger, M. E., Escorpizo, R., Bostan, C., & De Bie, R. (2014). Work Rehabilitation Questionnaire (WORQ): development and preliminary psychometric evidence of an ICF-based questionnaire for vocational rehabilitation. *Journal of Occupational Rehabilitation, 24*(3), 498–510.

Ghate, D. (2016). From programs to systems: deploying implementation science and practice for sustained real world effectiveness in services for children and families. *Journal of Clinical Child & Adolescent Psychology, 45*(6), 812–826.

Glegg, S. M., & Hoens, A. (2016). Role domains of knowledge brokering: a model for the health care setting. *Journal of neurologic physical therapy, 40,* 115–123.

Goel, A., & Gupta, L. (2020). Social Media in the Times of COVID-19. *Journal of Clinical Rheumatology, 26*, 220–223.

Gottlieb, M., & Dyer, S. (2020). Information and Disinformation: Social Media in the COVID-19 Crisis. *Academic Emergency Medicine, 7*, 640–641.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in Knowledge Translation: Time for a Map? *The Journal of Continuing Education in the Health Professions*, 26, pp. 13–24.

Grimshaw, J. M., Eccles, M. P., Lavis, J. N., Hill, S. J., & Squires, J. E. (2012). Knowledge translation of research findings. *Implementation Science, 7,* 50.

Grol, R. (1997). Beliefs and evidence in changing clinical practice. *British Medical Journal, 315,* 418–421.

Gustafsson, K., & Marklund, S. (2011). Consequences of sickness presence and sickness absence on health and work ability—a Swedish prospective cohort study. *International Journal of Occupational Medicine and Environmental Health, 24,* 153–165.

Halar, J., Amare, E., Labrecque, L., Didic, S., & Rowan, M. (2020). The use and benefits of evaluation framework modules at the Canadian Foundation for healthcare improvement: engaged capacity building and collaborative program evaluation planning. *Canadian Journal of Program Evaluation, 35*(2), 258–267.

Hamid, A. R. A. H. (2020). Social responsibility of medical journal: a concern for COVID-19 pandemic. *Medical Journal of Indonesia, 29*(1), 1–3.

Hamouda, O. (2003). HIV/AIDS surveillance in Germany. *Journal of Acquired Immune Deficiency Syndromes, 32*(Suppl 1), 49–54.

Haynes, R. B. (2001). Of studies, syntheses, synopses, and systems: The "4S" evolution of services for finding current best evidence. *EBM Evidence-Based Medicine, 6,* 36–38.

Hemp, P. (2004). Presenteeism: at work - but out of it. *Harv Bus Rev, 82,* 49–58.

Isernhagen, S. J. (1992). Functional capacity evaluation: rationale, procedure, utility of the kinesiophysical approach. *Journal of Occupational Rehabilitation, 2*(3), 157–168.

Johansen, V., Aronsson, G., & Marklund, S. (2014). Positive and negative reasons for sickness presenteeism in Norway and Sweden: a cross-sectional survey. *British Medical Journal Open, 4.* http://dx.doi.org/10.1136/bmjopen-2013-004123. Accessed 24 Apr 2021.

Kladny, B. (2011). Rehabilitation im TraumaNetzwerk D DGU. *Trauma und Berufskrankheit, 13*(1), 67–74.

Kothari, A., & Wathen, C. N. (2013). A critical second look at integrated knowledge translation. *Health Policy, 109,* 187–191.

Landry, R., Lamari, M., & Amara, N. (2003). Extent and determinants of Utilization of University Research in Government Agencies. *Public Administration Review, 63,* 192–205.

Lavis, J. N., Robertson, D., Woodside, J. M., McLeod, C. B., & Abelson, J. (2003). How can research organizations more effectively transfer research knowledge to decision makers? *The Milbank Quarterly, 81,* 221–248.

Linden, M. (2014). Psychosomatic inpatient rehabilitation: the German model. *Psychotherapy and Psychosomatics, 83*(4), 205–212.

Lukasczik, M., Wolf, H. D., Gerlich, C., LÖffler, S., Vogel, H., Faller, H., et al. (2011). Current state of vocationally oriented medical rehabilitation–a German perspective. *Disability and Rehabilitation, 33*(25–26), 2646–2655.

McAdam, R., & McCreedy, S. (1999). A critical review of knowledge management models. *The Learning Organization, 6*(3), 91–100.

McKibbon, K., Lokker, C., Keepanasseril, A., Colquhoun, H., Haynes, R., & Wilczynski, N. (2013). WhatisKT wiki: a case study of a platform for knowledge translation terms and definitions — descriptive analysis. *Implementation Science, 8,* 13.

Minbaeva, D. B. (2007). Knowledge transfer in multinational corporations. *Management International Review, 47*(4), 567–593.

Müller, W. D. (2015). Das Reha-Management der DGUV. *Trauma und Berufskrankheit, 17*(2), 293–300.

Müller, W. D., Simmel, S., Köhler, S., Hoffmann, R., & Reimertz, C. (2018). Einbindung von Rehabilitationseinrichtungen in die Traumanetzwerke-Praktische Umsetzung des Phasenmodells der Traumarehabilitation. *Physikalische Medizin, Rehabilitationsmedizin, Kurortmedizin, 28*(03), 163–170.

Nonaka, I., & Takeuchi, H., (1995). *The knowledge-creating company*. Oxford University Press.

Novak, J., & Wurst, M. (2004). Supporting knowledge creation and sharing in communities based on mapping implicit knowledge. *J. UCS, 10*(3), 235–251.

Rezabeygi, S., & Almasi, D. (2014). Organizational silence: a dangerous phenomenon in the way of the organizational progress. *International Journal of Basic Sciences & Applied Research, 3,* 300–306.

Robert-Koch-Institut. (2017). *RKI 2025. Evidenz erzeugen – Wissen teilen – Gesundheit schützen.* RKI.

Rogers, E. M. (1983). *Diffusion of Innovations* (3rd edn.). The Free Press.

Rogers, E. M. (1995). *Diffusion of Innovations* (4th edn.). The Free Press.

Scott, S. D., Plotnikoff, R. C., Karunamuni, N., Bize, R., & Rodgers, W. (2008). Factors influencing the adoption of an innovation: An examination of the uptake of the Canadian Heart Health Kit (HHK). *Implementation Science,* 41.

Scott-Findlay, S., & Estabrooks, C. A. (2006). Knowledge Translation and Pain Management. In A. Finley, P. McGrath, & C. Chambers (Eds.), *Bringing Pain Relief to Children* (pp. 199–227). Totowa: Humana Press.

Simmel, S., Müller, W. D., Reimertz, C., Kühne, C., & Glaesener, J. J. (2017). Phasenmodell der Traumarehabilitation. *Der Unfallchirurg, 120*(9), 804–812.

Spiel, C., Schober, B., & Strohmeier, D. (2016). Implementing intervention research into public policy-the "I(3)-Approach". *Prevention Science, 19,* 337–346.

Vakola, M., & Bouradas, D. (2005). Antecedents and consequences of organisational silence: an empirical investigation. *Employee Relations, 27,* 441–458.

Verhezen, P. (2010). Giving voice in a culture of silence. From a culture of compliance to a culture of integrity. *Journal of Business Ethics, 96,* 187–206.

Wong, S. P., Sharda, N., Zietlow, K. E., & Heflin, M. T. (2020). Planning for a safe discharge: more than a capacity evaluation. *Journal of the American Geriatrics Society, 68*(4), 859–866.

Final Remarks

This book has presented different topics related to new approaches for maintaining work ability in the workplace from multiple perspectives including occupational health and rehabilitation and behavioral economics. The book is based on three successful international seminars through the collaboration between the Norwegian National Advisory Unit on Occupational Rehabilitation, Norway and the Competence Center of Interdisciplinary Economic Research and Behavioral Economics (KCI), FOM University of Applied Sciences, Germany. The seminars were held in Frankfurt am Main in 2015 and Munich in 2016. A third seminar was held at the Rehaklinik Bellikon, in Bellikon, Switzerland in 2019. This seminar kept within the theme of the two previous ones. Here, three of the authors in this book presented new findings from their research fields. Prof. Reuben Escorpizo gave an update on the multidisciplinary approach to work disability, Dr. Thomas Johansen presented new findings about attention as a success factor for return to work in patients sick-listed due to anxiety, depression and pain, and Prof. Dr. Winand H. Dittrich presented new knowledge on behavioral economics and knowledge transfer in occupational rehabilitation. To further follow up on the seminars, in 2021, Prof. Dr. Winand H. Dittrich led a workshop on behavioral economics and mental health rehabilitation in a psychiatric center in Switzerland.

The aim of this book was to combine different perspectives and approaches from different fields, working towards the common goal of sustainable labor market participation from either the individual, employer, workplace, rehabilitation clinic, policy maker or social security system perspective. The European Commission's 2020 target that 75% of individuals in Europe aged between 24 and 60 should be in work has been a challenging task seen from a country-specific viewpoint. Beyond 2020, cross national and multi methodological approaches seem a sensible avenue to pursue in order to sustain high labor participation rates, also considering how the Covid-19 situation has affected the labor markets around the world. The contributions in this book point to new approaches, often not highlighted together, which present new knowledge and methodologies possible to implement in different European countries.

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Most contributions in this book emphasize stakeholder involvement as a prerequisite in achieving sustainable labor market participation.

In part one we started with a broad view given by Escorpizo et al. on the International Classification of Functioning, Disability and Health (ICF), which represent both a theoretical and conceptual model and a common language. The authors claimed that the quality of disability evaluations will be enhanced if the bio-psycho-social ICF framework is applied in clinical practice. Escorpizo et al. also combined the use of ICF Core Sets with an ICF based questionnaire, thereby giving an example of how the ICF can be operationalized for clinical practice. It is therefore recommended, not only to use ICF as a framework, but also to follow the practical example given by Konráðsdóttir from Iceland, in which the author has combined the use of ICF Core Sets in clinical practice with standardized psychological and physical self-reported instruments to assess work ability. Thus, giving support to the external validity of the ICF Core Set categories. Another practical example came from Veith-Tezeren and Dittrich in Chap. 5. The authors have cross-culturally adapted the Work Rehabilitation Questionnaire (WORQ), based on the ICF, from English to German. They also used a work motivation tool to investigate any associations between the ICF and motivation for return to work. They reported that both tools were feasible and acceptable to be used in a rehabilitation setting and the factors sleep and dealing with stress and other mental demands, as operationalized in WORQ, should be specifically adhered to in the rehabilitation process. The concept of work ability is always relevant and important to consider in all rehabilitation research and clinical practice, as emphasized by Grabovac and Dorner. In a labor market that is increasing in complexity, due to more entrepreneurship and a vast number of different sized companies, they argued that external support should be given to aid companies re-integrating workers in the workplace. They emphasized that the culture at work is often overlooked and is an avenue that deserves more empirical weight to better understand work ability and return to work factors. They also highlighted the Austrian Fit-2-Work project, aiming to improve labor market participation and prevent workers from falling out of the labor market. Taking the results and suggestions of the chapters in part one into account, Konráðsdóttir raised some critical questions in the last chapter. Namely, the case of implementing new ICF knowledge in clinical practice, while considering existing knowledge. This requires strategic planning and careful execution from the leadership to the individual professions if the ICF is going to be implemented in daily clinical practice.

In part two, Reims, in chapter seven, shifted the focus to individuals who are dependent on the social security system providing labor market interventions to support reintegration to the labor market. These interventions combat societal exclusion mechanisms representing barriers for reintegration. This investigation pointed to how different stakeholders, that are employees, employer and vocational rehabilitation services, must systematically collaborate to provide an orchestrated effort to support return to work. The importance of a joint effort by several stakeholders is followed up in the next chapter showing that workers who combined sick leave with graded return to work had less

sickness absence during a 3-year follow-up period compared to usual care. The graded return to work group also had a reduced risk of receiving a disability benefit by 40%. Being in work also led to a €4.000 higher income per year. Using the graded return to work approach showed that there was no difference in sickness absence between workers with musculoskeletal disorders, mental disorders, and cancer, giving support to the place and train approach from individual placement and support / supported employment. Hence, graded return to work is a method that can be used across different diagnostics groups and countries to gain higher income and promote health.

Part three commenced with findings from a qualitative study by Zucker et al. on how pathogenic clinical organizations, caused in part by increasing workload, could have a detrimental effect on workplace health promotion. They argued that preventing individuals from falling out of the labor market in the first place and creating workplaces meeting the psychosocial needs of employees seem key strategies. They emphasized that the contextual work setting must not be overlooked. Despite the efforts in the workplace to accommodate returning workers or keeping those who struggle in work, some workers go on long-term sick leave. These individuals can be referred to comprehensive work-related rehabilitation, for example, occupational rehabilitation, either as inpatient or outpatient services. Such interventions have shown to have an effect on return to work as described by Johansen in chapter ten. The author pointed to which cognitive functions are affected in sick listed individuals, which cognitive functions are implicated in return to work and how this could inform cognitive approaches in rehabilitation interventions, involving patient, rehabilitation teams and employment stakeholders. The focus on rehabilitation continued in an interesting piece of work by Chlupsa et al. although from a different perspective, namely rehabilitation psychology concerning the patient versus the worker. They argued that an individual's decision-making and implicit motivation are important factors in the return to work process, focusing on the employee as a key stakeholder who is surrounded by powerful stakeholder experts aiding in the return to work process. The patient, who previously was a well-functioning worker, must now evaluate and process vast amounts of information supposed to facilitate return to work. However, patients may lack the tools and knowledge needed when falling out of the labor market. Rehabilitation services should empower patients, together with medical and social management stakeholder involvement, enabling patients to make rational decisions and creating motivational drivers for return to work. This brought us back to preventing workers from falling out of the labor market highlighted by an example from Germany, where the employee and employer are key stakeholders. Porzelt and Cassens, in Chap. 12, argued that the distribution of corporate health care resources suffer from an imbalance between local, communal and regional stakeholder collaboration. Therefore, the German Federal Ministry of Health, is focusing on how shifting working conditions towards more technology-driven work tasks impact mental health and suggest the adaptation and implementation of the "health in all policies"-strategy. This should pave the way for companies, varying in size, to ensure that qualified health care personnel are at hand to

deal with mental health issues at work, and thereby shifting resources to local stakeholders. This could prevent workers falling out of work, also emphasized by Chlupsa et al., where rational decision-making processes and strategies to keep workers at work should be dealt with where the worker lives and works.

The authors of the final chapters, **in part four**, wrapped up the book by focusing on innovative technology related to measuring health, and demonstrated the advantages and possibilities of using ecologically valid measurements capturing real time data on the health of occupational rehabilitants. This opens up for contextualising work and health assessments and may prove to be a more reliable way in which to link rehabilitation measures and return to work using ecologically valid tools. In the final chapter, Dittrich provided new ideas on how to link innovation, behavioral economics and occupational health. These three fields are rarely connected in research, but this approach offers new ideas in terms of prolonging and sustaining working life for individuals and collectively as a society. The author suggested an updated model of knowledge translation to further develop theoretical and practical approaches of evidence-based rehabilitation.

This book encourages clinicians, researchers and policy makers to learn and adopt relevant clinical practices, research methodologies and system policies across countries involving key stakeholders to ensure that the labor market participation target set by the European Commission, continues to rise beyond 2020. This book has shown that stakeholder involvement is needed to prevent workers falling out of the labor market and returning workers back to work after sickness absence. These perspectives have been shown from a variety of occupational health-related domains including the individual, workplace and social security system levels, related to social, psychological and environmental factors, both outside and inside the workplace. The focus on stakeholder involvement, could serve researchers in the development of research hypotheses and research questions. This research, both in-country and cross-country, should also focus on knowledge transfer and exchange between research and practice, finally leading to enhancement of policy and practice in different countries.

Recommendations for Research and Practice

This book focused on the importance of collaborations between different stakeholders giving examples from a variety of domains and specific interventions used in occupational health and rehabilitation. Thus, the following recommendations for research and practice are put forward:

- Continuous phasing of health management without interruptions from accident and medical interventions to occupational rehabilitation and return to work
- Contextual factors and organisational culture in the workplace affecting work ability and functioning of individuals should receive more empirical research
- New ICF-related tools may be better suited to capture functioning related to work
- Graded return to work schemes enable contact with the workplace during sick leave or work disability and support work productivity
- Organizational structures affecting labor market participation ought to be assessed to create healthy work environments
- Assessing cognitive and emotional functioning and subjective work and health perceptions are key to fully capture the impairments and experiences of workers on sick leave
- Research tools and perspectives on bio-psycho-social dimensions, in particular decision-making, mental and emotional training options, deserve more attention to increase our knowledge about work ability in the workplace
- Applying comparative research and learn from good practice across different countries having used a comprehensive stakeholder approach
- Strengthen responsible departments or persons involved in the health sciences and occupational rehabilitation to apply a comprehensive approach

We conclude this book by encouraging future research and knowledge translation to build alliances across countries, health professions, practice-oriented research areas and applied methods to gain further knowledge and opportunities that improve sustainable labor market participation of people facing health challenges related to work in the years to come.

Dr. Thomas Johansen
Prof. Dr. Winand H. Dittrich

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