

Exploring the Diversity of Conceptualizations of Work (Dis)ability: A Scoping Review of Published Definitions

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Abstract *Purpose* Researchers are confronted to numerous definitions of work ability/disability, influenced by their context of emergence, discipline, purpose, underlying paradigm and relationship to time. This study provides an in-depth analysis of the concept through a systematic scoping review and the development of an integrative concept map of work (dis)ability. The research questions are: How has work (dis)ability been conceptualized from the perspectives of research, practice, policy and industry in the published scientific literature? How has the conceptualization of work (dis)ability evolved over time? *Methods* A search strategy was designed with a library scientist to retrieve scientific publications containing explicit definition(s) of work (dis)ability in leading-edge databases. The screening and the extraction of the definitions were achieved by duplicate assessment. The definitions were subject to a comparative analysis based on the grounded theory approach. *Results* In total, 423 abstracts were retrieved from the bibliographic databases. After removing duplicates, 280 unique records were screened for

inclusion. A final set of 115 publications containing unique original conceptual definitions served as basis for analysis. *Conclusions* The scientific literature does not reflect a shared, integrated vision of the exact nature and dimensions of work (dis)ability. However, except for a few definitions, there seems to be a consensus that work (dis)ability is a relational concept resulting from the interaction of multiple dimensions that influence each other through different ecological levels. The conceptualization of work (dis)ability also seems to have become more dynamic over time. The way work (dis)ability is defined has important implications for research, compensation and rehabilitation.

Keywords Occupational · Work ability · Work disability · Concept mapping · Meaning · Systematic review

Background and Objective

Today's researchers must position themselves in regard to a myriad of definitions and conceptualizations of work ability/disability [1–7]. Perspectives on these conceptualizations are influenced by their context of emergence (legal, clinical, academic), their purpose (to classify, understand, compensate, quantify), their epistemological assumptions (positivist, constructivist, etc.) and their underlying paradigm (biomedical, biopsychosocial, ecological, etc.). They also differ between researchers and health practitioners from different disciplines and with different roles. Work (dis)ability conceptualizations range from the most specific to the most comprehensive as they focus on one or several of its multiple dimensions (employment, well-being, context). Finally, there are different views on the relationships between time and work (dis)ability,

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which may be considered punctual, multiphase or continuous, and with linear, dynamic and/or recursive attributes.

These multiple and sometimes diverging perspectives might be partially attributed the complexity of work disability itself as a research object, the diverse meanings of work (from a right, to an obligation/duty or a privilege) and the diverse meanings of work disability (from a physical or psychological impairment “caused by work” to something that prevents you from working).

In the academic literature, work disability was long treated as almost exclusively according to two predominant perspectives: the biomedical and the insurance or forensic approaches [1]. The biomedical paradigm classically considers work disability as a condition related to pain and impairment, while the insurance perspective focuses on administrative, legal and financial consequences in terms of rights, responsibilities and compensation. In this latter perspective, disability is essentially studied in terms of duration and compensation cost [2, 8, 9], again with a particular emphasis on *objective proofs* of the *impairment* seen as the origin of work disability.

Current reflections in occupational health and work rehabilitation acknowledge the limitations of studying disability only in terms of physical symptoms and time to return to work. Since the late 1970s, different authors in the field of rehabilitation have advocated a more ecological and multifactorial *new paradigm of disability*, focusing on disability as an individualized experience taking place in a certain environment, as well as disability as a social phenomenon [10–12]. Occupational epidemiologists have also shown that the relationship between physical dysfunction and work disability was often weak and not straightforward, with the presence of one not necessarily implying the other [13]. As a result, several experts are pleading for an enlarged vision of work disability [1, 2, 7–9, 14, 15], with a scope exceeding the classic conceptions based on compensation duration, comparison of pre- and post-injury jobs or results of standardized physical function tests. For the social constructivism tenants, work disability must not only be seen as an individual attribute but also as a complex scheme of conditions, activities and relationships produced by the person’s social environment [16]. The biopsychosocial model emphasizes the multidimensional nature of work disability in an attempt to integrate individual physical and/or psychological dimensions with the environmental and social characteristics [1, 16]. Some researchers suggest an ecological conception of disability, emphasizing context and distinguishing individual, organizational (interactions with the healthcare system, employer, etc.) and societal (influence of social, political, economic and legislative structures) levels of analysis [7]. Others propose a shift in focus from the prevention and management of work *disability* to the promotion and preservation of work

ability. The concept of work ability, originating in the Scandinavian countries in the 1990s, also often highlights the dynamic and multidimensional aspects of the phenomenon, as well as the role of context, in overcoming the limitations of a more traditional strictly biomedical work disability model [17, 18]. As with work disability, however, there is no unique shared definition of work ability. Instead various and sometimes divergent theoretical perspectives, from the most reductionist to the most holistic, exist within the scientific community [18, 19].

The array of perspectives, ambiguities and controversies surrounding the conceptualization of work (dis)ability undoubtedly help in capturing the multi-faceted complexity of this object [20]. However, three main issues need to be addressed.

First, the decision, conscious or not, to adopt a specific perspective on work (dis)ability is not neutral and has an impact on research results [4, 21]. It influences the choice of specific outcomes and indicators, as well as specific methods, and it addresses more or less comprehensively the priorities of different stakeholders. The fact that the concept of work (dis)ability is often variably, loosely, or undefined in studies generates misunderstandings among experts and impedes interpretation of results. Awareness of the different perspectives and clarification of the view on work (dis)ability being taken is important both for the quality of research and to improve communication amongst experts.

Second, at the conceptual level, one can wonder if the dimensions added to the concept over time should all be part of its construct or if some constitute, in fact, upstream (i.e., determinants or intermediary factors) or downstream (i.e., consequences) variables related to work (dis)ability. It is crucial to clarify these conceptual issues surrounding the notion of work (dis)ability and specify precisely its dimensions before developing more elaborate theoretical models of its determinants.

Third, even when experts agree on a common general meaning or scope of work (dis)ability, inconsistent or vague conceptual definitions lead to great heterogeneity in its measurement and operationalization between studies, thus contributing to the fragmentation rather than integration of research results. This constitutes a major obstacle to the accumulation of evidence that researchers, clinicians and the healthcare system need to study, prevent and effectively reduce work disability and promote work ability [1–3].

A unique canonical definition of work (dis)ability may not be a useful or desirable outcome, as it could only be achieved at the expense of precision and richness in the study of this multi-faceted phenomenon. Instead, this scoping review of the published definitions aims to acknowledge and illustrate the wide range of conceptualizations of work ability and

disability across professions and disciplines, understand the differences and similarities of the multiple perspectives, clarify the dimensions of its construct, highlight some of the conceptual issues or paradoxes inherent to the notion of work (dis)ability and highlight the impact of choosing one perspective or another. In this paper, work ability and disability are considered to relate to facets of the same phenomenon, so conceptualizations of both terms are addressed. The final product of this scoping review will be a proposal of an integrative concept map of work (dis)ability.

The aim of this study is thus to perform a scoping review of published definitions of work (dis)ability, the comparative analysis of these definitions and the development of a conceptual map of work (dis)ability. The specific review questions addressed are:

1. How has work (dis)ability been conceptualized from the perspectives of research, practice, policy and industry in the published scientific literature?
2. How has the conceptualization of work (dis)ability evolved over time?

Methods

Search Strategy and Data Collection

A synthetic comparative research strategy based on Glaser and Strauss's inductive grounded theory approach [22–25] was adopted to achieve the aforementioned objectives. A systematic scoping review [26, 27] was conducted to retrieve scientific publications containing one or several explicit definition(s) of work (dis)ability. By "explicit definition" we meant an overt specification of the meaning of work (dis)ability, whether it was quite broad or very operational. Anderson et al. offer a formal definition and discuss the methodological framework of scoping reviews and concept mapping [28]. To our knowledge no specific guidelines currently exist for systematic scoping reviews, so we followed similar methods to other high-quality systematic reviews of published definitions [29–32]. The scope of the search was deliberately broad to include definitions representative of various perspectives in research, clinics and public policy. The work (dis)ability definitions represent the views of research institutions, individual researchers, healthcare professionals, policy makers and other stakeholders from different disciplines and jurisdictions. Records were identified in leading databases (supplementary appendix) in physiotherapy (PEDro), ergonomics and rehabilitation (Rehabdata), medicine (Medline, Embase, EBM reviews, CINHAL), psychology (PsychINFO, ProQuest Psychology), social sciences (Econlit, Sociological Abstracts, Canadian Research Index, Francis, Worldwide Political Science

Abstracts, Business Source Premier, Gender Studies Database, International Political Science Abstracts, Public Administration Abstracts), and in multidisciplinary databases (Google Scholar).

Selection criteria were set a priori to include: (a) peer-reviewed journal articles, academic books and book sections, scientific/technical reports, doctoral dissertations, conference papers or proceedings, workshop papers and documents published by government agencies or international intergovernmental organizations, (b) written in English, and (c) proposing an *original* conceptual definition of work (dis)ability in explicit terms in the title, abstract or body of the paper, regardless of publication date or methods. (d) Publications containing an original definition cited by the papers retrieved with the search string were also included if they satisfied criteria (a), (b) and (c). The Boolean search string was designed and tested with a reference librarian to apply to a variety of database search engines and to make the quest as exhaustive as possible while minimizing false positives. Synonyms, antonyms and workclass variations of the term were identified in a pilot study including preliminary searches and consultation of dictionaries and thesauruses. The search string was:

Work disability defined" OR "work ability defined" OR "occupational disability defined" OR "work-related disability defined" OR "define work disability" OR "define work ability" OR "define occupational disability" OR "define work-related disability" OR "defines work disability" OR "defines work ability" OR "defines occupational disability" OR "defines work-related disability" OR "defined work disability" OR "defined work ability" OR "defined occupational disability" OR "defined work-related disability" OR "defining work disability" OR "defining work ability" OR "defining occupational disability" OR "defining work-related disability" OR "definition of work disability" OR "definition of work ability" OR "definition of occupational disability" OR "definition of work-related disability" OR "work disability is defined" OR "work ability is defined" OR "occupational disability is defined" OR "work-related disability is defined" OR "work disability was defined" OR "work ability was defined" OR "occupational disability was defined" OR "work-related disability was defined" OR "work disability has been defined" OR "work ability has been defined" OR "occupational disability has been defined" OR "work-related disability has been defined"

Endnote software was used to manage references and remove duplicates. The full text of the records identified from the search and each unique definition were screened for inclusion by two independent examiners. The verbatim

conceptual definitions, citation references and source databases were extracted by the lead author only. The first record to mention an original definition was tracked down and added to the sample if it had not already been retrieved with the search string. The frequency of citation by peers was also recorded for each original definition in order to estimate the extent to which it was used in research and practice.

Qualitative Analysis

These conceptual definitions were subject to a comparative analysis. The analysis did not follow a linear process but rather an inductive and iterative strategy. Verbatims were coded by the lead author according to the grounded theory methodology [24]. The purpose of the coding was to identify the dimensions and properties of each definition (open coding) as well as their relationships (axial coding). Basic units of analysis were meaningful segments of text (words, sentences or paragraphs) that reflected a single homogeneous nonoverlapping theme or dimension. Text units were then analyzed using the constant comparative method of qualitative analysis [25]. This transversal content analysis involved the identification of global dimensions of the concept, recurrent themes, variations, contradictions and their connections. Particular attention was given to the evolution and shifts in content over time. Several readings of the definitional data and regular discussions with the co-authors helped clarify the boundaries of the emerging theory and ensured a uniform categorization of similar text units. The ultimate objective of this analytical breakdown and synthesis of the dimensions of the concept was to develop an integrative concept map of work (dis)ability.

Results

Overview of Literature Included in the Review

In total, 423 abstracts were retrieved from the bibliographic databases (Fig. 1). After removing duplicates, 280 unique records were screened for inclusion. Publications citing a definition from another author or paper were excluded. Records containing the original cited definition were tracked down and added if they were not already included. This procedure yielded 13 additional papers bringing the total to 293 papers. A final set of 115 publications containing unique original conceptual definitions served as basis for analysis (supplementary appendix). Publication dates spanned the last three decades (1981–2011), the majority (70.7 %) being published since 2001. Based on the location of the lead author, records mainly originated from the United States (44.8 %), the Netherlands (12.1 %), Finland (10.3 %),

Sweden (10.3 %), and Canada (8.6 %), but also from the United Kingdom, Germany, Denmark, Australia, Belgium, China, France, Norway, Portugal, and Spain. There was a variety of publication formats (Fig. 1), the majority being journal articles (77.4 %). The length of included conceptual definitions ranged from three to 310 words. Eighty one percent referred to the concept as work “disability” while 19 % designated it work “ability”.

Major Conceptual Definitions in the Literature

Examining the frequency of citations by peers, it appeared that very few work (dis)ability definitions were broadly recognized and integrated by the scientific community. Only two definitions were cited by more than 5 % of the publications that included conceptual definitions. The definition of work ability by Tuomi et al. [33] was the most frequently cited, appearing in 6.2 % of all articles containing conceptual definitions. The second most prominent definition was the official characterization of work disability by the US Census [34], cited in 5.6 % of the publications.

Conceptualization of the Levels of Analysis: From an Individual to an Ecological Perspective

Table 1 shows the key dimensions identified in the 115 original definitions of work (dis)ability during the open coding

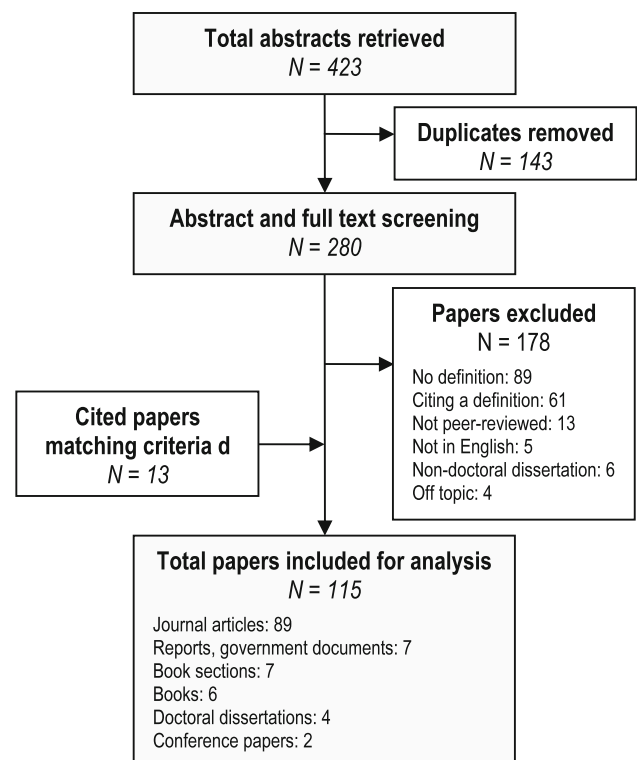


Fig. 1 Summary of the review process

Table 1 Summary of the open coding analysis: conceptualization of the levels and dimensions of work (dis)ability

Years	Authors, references	Individual level									
		General condition	Health/medical condition	Physical dimension	Mental/behavioral/emotional dimension	Social dimension	Demographic dimension	Financial dimension	Educational/vocational dimension	Cultural/symbolic dimension	
1981–2011	US Census Bureau [34]	x	x				x				
1983	McNeil [89]	x	x	x	x		x				
1986	Chirikos [90]	x									
1987	Yelin et al. [41]						x				
1988	Russo et al. [55]		x	x							
1989	Greenwald et al. [91]		x								
1989	Yelin [92]		x				x				
1990	Levine et al. [93]		x	x	x		x				
1991	Allaire et al. [94]		x	x			x				
1991	Ilmarinen et al. [95]			x	x	x				x	
1991	McNeil et al. [96]	x	x				x				
1991	Nygård et al. [97]	x									
1991	Tuomi et al. [33]	x		x	x						
1991	Yelin et al. [50]		x								
1992	US Bureau of the census [37]		x	x	x						
1995	Spoonster [98]	x									
1996	Blanc et al. [99]			x							
1996	Blanc et al. [100]	x		x							
1996	Santiago et al. [56]		x								
1996	Straaton et al. [101]		x	x	x					x	
1996	Wolfe et al. [102]	x									
1997	McDonough [103]	x		x	x						
1997	Partridge et al. [104]			x							
1997	Stronks et al. [105]		x								
1998	US Social Security Administration et al. [38]		x	x	x					x	
1999	Blanc et al. [106]			x							
1999	Ilmarinen [48]		x		x						
1999	Ilmarinen et al. [107]	x	x		x					x	
1999	Jans et al. [108]	x	x		x						
1999	Löfvander [109]	x		x							
1999	Mayfield et al. [110]	x	x								
2000	Blanc [111]	x	x	x							
2000	Guillemin [112]		x								
2000	Wang et al. [113]	x	x							x	
2001	Allaire [54]		x							x	
2001	Barlow et al. [53]			x							
2001	Boonen et al. [114]	x		x						x	
2001	Boonen et al. [115]		x	x						x	

Table 1 continued

Years	Authors, references	Individual level									
		General condition	Health/medical condition	Physical dimension	Mental/behavioral/emotional dimension	Social dimension	Demographic dimension	Financial dimension	Educational/vocational dimension	Cultural/symbolic dimension	
2001	Fredriksen-Goldsen et al. [116]		x	x	x						
2001	Lund [117]	x	x								
2001	MacDonald-Wilson et al. [118]	x			x						
2001	Poljonen [119]		x								
2002	Boonen et al. [61]	x		x						x	
2002	Boonen et al. [120]	x		x							
2002	Shaw et al. [121]	x	x	x							
2003	De Jong [40]	x	x							x	
2003	de Walque [122]	x									
2003	Kessler et al. [123]				x						
2003	Lipton et al. [64]			x							
2003	Lund et al. [124]	x									
2003	Vandenplas et al. [125]			x							
2004	Allaire [126]	x		x							
2004	Crimmins et al. [127]		x							x	
2004	Gouttebauge et al. [128]			x	x						
2004	Lacaille et al. [60]			x						x	
2004	Puolakka et al. [129]		x	x							
2004	Robinson et al. [130]										
2004	Visser et al. [131]										
2004	Vuori et al. [51]		x	x	x				x		
2005	Allaire et al. [132]			x						x	
2005	Burton [59]	x	x	x	x						
2005	Malek et al. [133]			x							
2005	Merkesdal et al. [134]										
2005	Wolfe et al. [135]									x	
2006	Burton et al. [57]	x									
2006	Chung et al. [136]			x							
2006	Eisner et al. [63]			x							
2006	Franche et al. [137]										
2006	Kremer et al. [138]	x									
2006	Lindberg [139]		x								
2006	Lindberg et al. [140]		x	x						x	
2006	Shaw et al. [62]										
2006	Steenstra et al. [141]		x	x						x	
2006	Tseng et al. [142]										
2007	Bertoli et al. [143]	x	x								

Table 1 continued

Years	Authors, references	Individual level									
		General condition	Health/medical condition	Physical dimension	Mental/behavioral/emotional dimension	Social dimension	Demographic dimension	Financial dimension	Educational/vocational dimension	Cultural/symbolic dimension	
2007	Committee on Veterans' Compensation for Posttraumatic Stress Disorder et al. [144]	x									
2007	Eberhardt et al. [145]		x								
2007	Fonseca et al. [146]		x								
2007	Karlsson [147]	x	x						x		
2007	Thulesius et al. [46]			x	x						
2008	Allaire et al. [148]	x		x					x		
2008	Gould et al. [17]	x									
2008	Kuoppala et al. [149]		x	x	x	x					
2008	Mok et al. [150]			x							
2008	Nordenfält [151]			x	x	x					x
2008	Plug et al. [152]			x	x	x					
2008	Utset et al. [153]			x							
2008	Walt [154]	x								x	
2008	Zirkzee et al. [155]			x							
2009	Al Dhanhani et al. [58]	x									
2009	Detaille et al. [156]	x									
2009	Hudson et al. [157]	x								x	
2009	Munir et al. [158]		x								
2009	Toren et al. [159]			x							
2009	Tunceli et al. [160]			x	x						
2009	Warren et al. [161]			x							
2010	Benítez-Silva et al. [52]	x									x
2010	Cerghet et al. [162]	x									
2010	Claessen et al. [163]	x									
2010	Franche et al. [164]			x							
2010	Karlsson et al. [165]		x							x	
2010	Kristman et al. [166]			x							
2010	Malo et al. [167]			x							
2010	Salo et al. [168]		x								
2010	Spanjer et al. [169]		x								
2010	Swan [170]			x							
2010	Warner et al. [171]				x						
2011	Dellve et al. [65]		x								
2011	Gudbergsson et al. [172]			x							x
2011	Guidotti [173]	x									
2011	Gutiérrez-Rojas et al. [174]										

Table 1 continued

Years	Authors, references	Individual level										Societal level					
		General condition	Health/medical condition	Physical dimension	Mental/behavioral/emotional dimension	Physical dimension of work	Social dimension of work	Financial dimension of work	Structural dimension of work	Organizational culture and climate of work	Insurance meso-system	Healthcare meso-system	Community meso-system	Political-legal dimension	Macro economic dimension	Sociodemographic dimension	Cultural/symbolic dimension
2011	Mäcnicol [175]	x	x		x												x
2011	Neovius et al. [176]	x	x														
2011	Tengland [86]			x	x									x			x
2011	Virtanen et al. [177]		x														
Years	Author, references	Organizational level										Societal level					
		Work mesosystem (no specific dimension)	Physical dimension of work	Mental/behavioral/emotional dimension of work	Social dimension of work	Financial dimension of work	Structural dimension of work	Organizational culture and climate of work	Insurance meso-system	Healthcare meso-system	Community meso-system	Political-legal dimension	Macro economic dimension	Sociodemographic dimension	Cultural/symbolic dimension		
1981–2011	US Census Bureau [34]	x							x								
1983	McNeil [89]	x							x								
1986	Chirikos [90]	x															
1987	Yelin et al. [41]	x															
1988	Russo et al. [55]	x			x												
1989	Greenwald et al. [91]	x															
1989	Yelin [92]	x															
1990	Levine et al. [93]																
1991	Allaire et al. [94]																
1991	Ilmarinen et al. [95]	x															
1991	McNeil et al. [96]	x															
1991	Nygård et al. [97]	x															
1991	Tuomi et al. [33]	x															
1991	Yelin et al. [50]	x															
1992	US Bureau of the census [37]	x															
1995	Spoonster [98]	x															
1996	Blanc et al. [99]	x															
1996	Blanc et al. [100]	x															
1996	Santiago et al. [56]	x															
1996	Straaton et al. [101]	x															
1996	Wolfe et al. [102]	x															
1997	McDonough [103]	x															
1997	Partridge et al. [104]	x															
1997	Stronks et al. [105]	x															

Table 1 continued

Years	Author, references	Organizational level							Societal level						
		Work mesosystem (no specific dimension)	Physical dimension of work	Mental/behavioral/emotional dimension of work	Social dimension of work	Financial dimension of work	Structural dimension of work	Organizational climate of work	Insurance meso-system	Healthcare meso-system	Community meso-system	Politico-legal dimension	Macro economic dimension	Sociodemographic dimension	Cultural dimension
1998	US Social Security Administration et al. [38]	x								x					
1999	Blanc et al. [106]	x													
1999	Ilmarinen [48]	x			x										
1999	Ilmarinen et al. [107]	x													x
1999	Jans et al. [108]														
1999	Löfvander [109]	x													
1999	Mayfield et al. [110]	x													
2000	Blanc [111]	x													
2000	Guillemin [112]	x	x												
2000	Wang et al. [113]	x													
2001	Allaire [54]	x													
2001	Barlow et al. [53]	x													
2001	Boonen et al. [114]	x													
2001	Boonen et al. [115]	x													
2001	Fredriksen-Goldsen et al. [116]	x													
2001	Lund [117]	x													
2001	MacDonald-Wilson et al. [118]	x													
2001	Pohjonen [119]	x													
2002	Boonen et al. [61]														
2002	Boonen et al. [120]	x													
2002	Shaw et al. [121]	x													
2003	De Jong [40]	x													
2003	de Walque [122]	x													
2003	Kessler et al. [123]	x													
2003	Lipton et al. [64]	x													
2003	Lund et al. [124]	x													
2003	Vandenplas et al. [125]	x													
2004	Allaire [126]	x													
2004	Crimmins et al. [127]	x													
2004	Grotheborge et al. [128]	x													
2004	Lacaille et al. [60]	x													

Table 1 continued

Years	Author, references	Organizational level						Societal level							
		Work mesosystem (no specific dimension)	Physical dimension of work	Mental/behavioral/emotional dimension of work	Social dimension of work	Financial dimension of work	Structural dimension of work	Organizational culture and climate of work	Insurance meso-system	Healthcare meso-system	Community meso-system	Politico-legal dimension	Macro economic dimension	Sociodemographic dimension	Cultural dimension
2004	Puolakka et al. [129]								x						
2004	Robinson et al. [130]								x						
2004	Visser et al. [131]								x						
2004	Vuori et al. [51]	x													
2005	Allaire et al. [132]	x													
2005	Burton Jr [59]	x							x						
2005	Malek et al. [133]	x													
2005	Merkesdal et al. [134]	x							x						
2005	Wolfe et al. [135]								x						
2006	Burton et al. [57]	x													
2006	Chung et al. [136]	x													
2006	Eisner et al. [63]	x													
2006	Franche et al. [137]								x						
2006	Kremer et al. [138]								x						
2006	Lindberg [139]								x						
2006	Lindberg et al. [140]	x													
2006	Shaw et al. [62]	x													
2006	Steenstra et al. [141]	x													
2006	Tseng et al. [142]	x													
2007	Bertoli et al. [143]														
2007	Committee on Veterans' Compensation for Posttraumatic Stress Disorder et al. [144]								x						
2007	Eberhardt et al. [145]	x													
2007	Fonseca et al. [146]												x		
2007	Karlsson [147]	x							x				x		
2007	Thulesius et al. [46]	x							x				x		
2008	Allaire et al. [148]	x													
2008	Gould et al. [17]	x											x		
2008	Kuoppala et al. [149]	x											x		
2008	Mok et al. [150]	x													
2008	Nordenfält [151]	x	x												
2008	Plug et al. [152]	x													

Table 1 continued

Years	Author, references	Organizational level							Societal level						
		Work mesosystem (no specific dimension)	Physical dimension of work	Mental/behavioral/emotional dimension of work	Social dimension of work	Financial dimension of work	Structural dimension of work	Organizational culture and climate of work	Insurance meso-system	Healthcare meso-system	Community meso-system	Political-legal dimension	Macro economic dimension	Sociodemographic dimension	Cultural dimension
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2008	Welti [154]														
2008	Zirkzee et al. [155]	x													
2009	Al Dhanhani et al. [58]	x													
2009	Detaille et al. [156]	x													
2009	Hudson et al. [157]	x													
2009	Munir et al. [158]	x													
2009	Toren et al. [159]	x													
2009	Tunceli et al. [160]	x													
2009	Warren et al. [161]	x													
2010	Benitez-Silva et al. [52]	x													
2010	Cerghet et al. [162]	x													
2010	Claessen et al. [163]	x													
2010	Franche et al. [164]	x													
2010	Karlsson et al. [165]	x													
2010	Kristman et al. [166]	x													
2010	Malo et al. [167]	x													
2010	Salo et al. [168]	x													
2010	Spanjer et al. [169]	x													
2010	Swan [170]	x													
2010	Warner et al. [171]	x													
2011	Deilve et al. [65]	x													
2011	Gudbergsson et al. [172]	x													
2011	Guidotti [173]	x													
2011	Gutiérrez-Rojas et al. [174]	x													
2011	Macnicol [175]	x													
2011	Neovius et al. [176]	x													
2011	Tengland [86]	x													
2011	Virtanen et al. [177]	x													

and the inductive comparative analysis. Note these dimensions are not necessarily related to an underlying or precipitating event or injury considered at the origin of work (dis)ability. That is, the dimensions do not necessarily represent factors leading to a certain level of work (dis)ability (a determinant), but can also represent factors preventing a person from getting out of work disability and the capacities and facilitators that increase the person's work ability (a part of the process), as well as factors resulting from work (dis)ability (a consequence or outcome).

These dimensions reflected multiple levels of analysis grouped broadly into individual, organizational and societal levels. The individual level includes all dimensions related to the worker's condition, which must be understood not only medically (as the presence or absence of illness/handicap) but as encompassing all personal assets, facilitators and barriers that characterize the worker in regard to the work (dis)ability (skills, experience, health, behaviors, perceptions, values, etc.). The organizational level considers the organizational and institutional factors that contribute to shaping or structuring work (dis)ability, including attributes related to relationships between different (dis)ability stakeholders (worker, clinicians, employer, colleagues, family and friends, compensation board case managers, etc.) and different mesosystems in which interpersonal relations occur (compensation boards, workplace, union, healthcare services). At the societal level, work (dis)ability is conceptualized as a social phenomenon influenced or even generated by broader historical, cultural, legislative, financial, social, demographic and political macrostructures and dynamics, such as unemployment rates, sick leave policies and compensation levels, work legislation, healthcare access and coverage, population aging, historical union battles, value systems, etc.

In general, the definitions did not reflect an integrative conceptualization across the three levels of analysis. Our results showed, however, that the view of work (dis)ability as being solely based on the assumption of a medically defined illness or injury was not common (2.6 %). Most definitions (80.0 %) included at least one individual dimension (mainly related to the idea of health/medical condition) and one organizational dimension (mainly related to the demands of the work environment). About a tenth of the definitions (11.3 %) referred concurrently to individual, organizational and societal elements to describe the concept.

Conceptualization of the Dimensions: From Unidimensional to Multidimensional

The Individual Dimensions

Conceptualizations of the worker's condition at the individual level varied greatly in range and specificity. The least specific

definitions referred only to general terms such as (in)capacity, (dis)ability, condition, (dis)function or disorder to characterize the individual attributes (14.7 %). Other less inclusive definitions described the individual dimension of work (dis)ability as a medical or health condition (14.7 %) without further specification. The conceptualization of the medical or health condition exclusively in terms of the worker's physical health was, however, often implicit, with the use of terms like *impairment* or *sickness*. More explicit definitions referred to one or several specific individual dimensions. In total, we identified seven individual dimensions. The *physical dimension* and *mental/emotional/behavioral dimension* of work (dis)ability were by far the most frequently cited (respectively 47.0 and 24.4 %). The *physical dimension* focused on physiological or anatomical restrictions or abilities. The *mental/emotional/behavioral dimension* focused on mental health, psychological assets and barriers, and cognitive abilities, including the worker's coping ability, adaptability, level of motivation, job satisfaction, fulfillment, inertia, mental fatigue or energy, recovery expectations, self-confidence, attention, memory or reasoning. Four other dimensions were cited less frequently. The *social dimension* focused on the worker's social assets and drawbacks related to work (dis)ability (e.g., networking and bonding capacities, relational abilities, social skills or on the other end, social awkwardness or behavioral weirdness). The *demographic dimension* included references to relatively stable personal attributes (age, gender, immigration status, language or urban/rural area) to define work (dis)ability. The *financial dimension* included features such as the worker's financial latitude or restriction, and monetary incentives to work (income, insurance plans, retirement plans, bonuses) or not work (e.g., level of compensation benefits). The *educational/vocational dimension* drew on professional skills, competencies, degrees, experience or know-how to characterize work (dis)ability. Finally, *the cultural/symbolic dimension* referred to features like occupational virtues (e.g., toleration, courage), meaning of work (a right, a duty, an obligation, a need, a structure to the everyday life, a symbol of success, a means of rehabilitation), perception of the social role of sickness, disablement or impairment (the proclivity to see oneself, report oneself and/or behave according to one's representation of the role that a person being sick or work-limited should take in society), and more generally personal ethics, values and attitudes towards work, life and (dis)ability (e.g., valorization of hard work, diligence, accountability or disapprobation of malingering or laziness).

Over the years, the view has generally shifted from a narrower focus on the individual's physical impairment, disease or handicap to a more holistic multidimensional conception of the constitution of the individual's *condition* in regard to work (dis)ability. This shift began with the addition of mental health to the idea of impairment. Other personal characteristics, such as education, work experience, social

skills or motivation, were added over time. However, the focus at the individual level seems to remain most frequently on the individual's physical and sometimes mental health.

The Organizational Dimensions

In addition to the worker's individual attributes, work (dis)ability can also be understood as a product of the different mesosystems in which the worker is involved at the organizational level. Definitions mentioned four of these mesosystems: the workplace mesosystem, the insurance mesosystem, the healthcare mesosystem and the community mesosystem.

Aspects related to work environment demands and facilitators were by far the most cited and detailed. Although many of the definitions were vague regarding the constitution of the workplace environment, work life or work demands, they often implicitly referred to the physical dimension of work.

Six work-related dimensions or sub-themes were identified in the more specific definitions. The *physical dimension of work* referred to the biomechanical exposures and ergonomic conditions in the work environment, such as the physical workload, repetitive movements, static work, vibrations, etc. The *mental/emotional/behavioral dimension of work* included psychosocial work attributes, demands and facilitators such as mental workload, stress and pressure (related to time, performance or productivity), decision latitude, job autonomy, and control of tasks or schedules. The *social dimension of work* appeared in the definitions through allusions to relationships with colleagues and/or supervisors (e.g., support, stigma, tensions, friendships, collaboration) and through work interpersonal demands. The two most ostensible notions that emerged in this context were the importance of social support at work and the idea of legitimacy ("the degree to which an injured employee feels that others believe the authenticity of their injury and of their symptoms" [35]). The *financial dimension of work* appeared through references to job insecurity, opportunities for promotion, development or movement in the organizational structure, competitiveness and sustainability of the company or the sector, or financial health of the company. The *structural dimension of work* referred to relatively stable work attributes such as the sector, company size, accessibility (transportation, geographic location), or structural ergonomic factors (equipment, technology, working stations). The term *organizational culture* referred to the role of organizational norms, traditions, values, myths and beliefs in creating, maintaining or defining work (dis)ability. The term *organizational climate* referred to aspects such as leadership style, organizational structure (e.g., hierarchical, flat), accountability and behavior standards, communication

patterns, trust or organizational connectiveness. The *organizational culture and climate dimension of work* emerged in the definitions through notions such as discrimination or commitment to hiring people with disabilities, openness to work accommodations, work (dis)ability management style, return-to-work policies, conflict resolution procedures, performance evaluation procedures, productivity or efficiency requirements, accountability, respect and valorization of workforce diversity or conformity, history of labor/union/management relations, relationships with other work (dis)ability stakeholders (workers, clinicians, compensation board, relatives), employee assistance programs, promotion of health/well-being/work ability/personal development, attitudes towards workforce retention and stabilization, people-oriented and safety-oriented culture.

The *insurance mesosystem* was often incorporated in the definitions (28.7 %) either in a role of evaluating, labeling, legitimizing or allowing a worker to become "officially" recognized as work disabled (for example when they referred to work disability as the process of receiving disability benefits or time loss compensation), or in a role of vocational rehabilitation. The *healthcare mesosystem*, appearing in 9.3 % of definitions, was also often referred to as a way to determine the existence and severity of work disability through the diagnosis of physical and mental impairments, or at least to "legitimize" or "officialize" them. It was not often raised in a cure or care perspective. The *community mesosystem* was evoked in 3.5 % of definitions through references to family, relatives, micronetworks and community as a source of social or financial support, unpaid workload outside of the workplace (volunteering or housework), family charges and responsibilities, or again in a role of labeling, legitimizing and/or stigmatizing work disability.

The Societal Dimensions

Finally, the societal level of work (dis)ability emerged in a few definitions, either generally or through the mention of specific macrosocial attributes of work (dis)ability. These attributes were grouped into four dimensions: politicolegal, macroeconomic, sociodemographic, and cultural, and were cited by 7.0, 7.0, 3.5 and 4.4 % of the definitions respectively. The *politicolegal dimension* included elements related to the political and legislative context and orientations among intra- or international jurisdictions affecting work (dis)ability through healthcare, welfare, education, health and safety promotion, unemployment, retirement, labor regulations, or more generally, existing public policies, political agendas and priorities. The *macroeconomic dimension* referred to the impact of local and national labor market demands and dynamics, unemployment rates, job insecurity, availability of work, technological development,

changes in industries (e.g., globalization, workforce downsizing, delocalization) in creating or shaping work (dis)ability. The *sociodemographic dimension* referred to the way sociological and demographic trends affect work (dis)ability through elements like population aging, working age shift, gender differences in labor participation, or immigration. The *cultural dimension* referred to the idea that cultural values and norms change from a society to the next, potentially impacting work (dis)ability (e.g., the meaning of work in a protestant versus a catholic culture or the way historical labor force battles shaped the relationships between union and government).

Conceptualization of the Relationships Between the Concept's Attributes

Our analysis revealed a great heterogeneity in the way the relationships within and between these multiple levels and dimensions were conceptualized (Table 2). These different conceptualizations of the connections of work (dis)ability attributes are difficult to untangle without linking them to their underlying theoretical models and assumptions, since one reflects the other. These theories or fragments of theories contribute to a better understanding of the conceptualizations of work (dis)ability. Instead of detailing and comparing each theoretical framework, a topic already brilliantly covered by others [1, 36], this presentation will draw from the data to expose different theoretical shifts of the concept of work (dis)ability over the years as they present in the definitions we have analyzed. Although, they will be introduced more or less chronologically, note that all conceptualizations described are still prevalent in today's research literature.

A first category of definitions reflected a biomedical theoretical model in which either physical impairment equated to work disability, or a linear causal relationship was drawn from physical impairment to work disability. In the second view, impairment and work disability constituted two distinct concepts. This view implied that a certain medical impairment may not necessarily lead to work disability for everybody, but in the presence of work disability, health impeded work and a medical condition was the primary cause of work limitations or interruption. Two notorious examples of such definitions are the one introduced in the 1990 US "Census of population and housing" [37] and the US Social Security Administration's definition [38].

A second category of definitions conceptualized work (dis)ability as resulting from the interaction between the individual's mental and physical health (or a broader set of individual characteristics) and the requirements of work. This implied that a certain set of individual attributes may not always lead to a similar pattern of work (dis)ability when taking into account work demands. For example, an

impairment such as tennis elbow would have more impact on an administrative assistant's ability to perform computer work than it would on the ability of a professional speaker to present. In this view, two workers with the same set of individual characteristics (same injury, same mental health status, same degrees and experience, same attitudes and motivations towards return-to-work, etc.) may or may not "develop" work disability and, the same set of conditions could lead to more or less severe work disability depending on the worker's job requirements.

Most disability insurance schemes seemed to adopt one of these two first categories of work disability definitions when attempting to assess it.

A third set of definitions was fairly similar to the previous category but included an intermediate step: the idea of functional capacity or functional limitations. Verbrugge and Jette [39] define functional limitations as restrictions in physical or mental actions, such as ambulating, reaching, climbing stairs, or producing intelligible speech. The relationship to functional capacity seemed to be understood in two different ways, depending on the author: either resulting exclusively and directly from an impairment and, thus, solely inherent to the individual; or resulting from the interaction between an impairment and work requirements or accommodations. Note that both the terms *functional limitations* and *functional capacities*, as well as their synonyms, had different meanings between authors and often remained undefined. However, the common thread among this set of definitions seemed to be the shift in focus from the original disease or impairment to its consequences for the worker's activities. This view coincides with the so-called medical vocational perspective [1, 40] shared, for example, by many occupational therapists. It gives more attention to the worker's adjustment to impairment (with or without regard to work requirements), and less to the worker's pathology or broader extrinsic environmental factors that could impact work (dis)ability [36]. It also emphasizes the process of becoming work disabled rather than seeing it as an outcome.

A fourth category of definitions reflected yet another historical shift: the enlargement of the contextual considerations to recognize the social dimension of work (dis)ability and progressively include increasingly broad levels of environmental influences on work (dis)ability. In opposition to the medical model, which regarded work (dis)ability solely as an individual characteristic directly related to a medical condition, this perspective acknowledges that work (dis)ability can also be socially constructed and result from the interaction of individual attributes (e.g., health disorder, education, coping abilities, age) and extrinsic environmental factors (e.g., workplace accessibility, social support, access to healthcare, sector's competitiveness, labor regulations or disability legislation). This set of definitions is indicative of a

Table 2 Conceptualization of the relationships between the concept's attributes

Representative perspectives on work (dis)ability	Typical focus
I. Physical impairment = ss work disability or Physical impairment → work disability Example: work disability [is] defined as not working due to the illness [50]	Individual's physical impairment
II. Individual's impairment + individual's work requirements → work disability Example: the definition of work ability can be derived from workers health in relation to job demands and work environment [51]	Individual's physical and mental impairment and work requirements
III. Individual's impairment → functional limitations → work disability or Individual's impairment + individual's work requirements → functional limitations → work disability Example: we can define work disability as the inability to meet the demands of gainful activity, due to functional limitations, caused by impairment [40]	Functional limitations, disablement process
IV. Individual's set of characteristics (physical, mental, social,...) + Organizational environment (workplace, healthcare,...) + Societal environment (macroeconomy, legislation,...) → work disability Example: Work disability is a socially evolving concept, related to how society and employers accommodate the needs of individuals with certain conditions. In addition, work disability is also a function of individuals' willingness to continue their attachment to the labour force and can thereby also be a function of economic conditions [52]	Interaction of individual's characteristics and extrinsic environment, disablement process, work disability prevention
V. Individual's set of characteristics (physical, mental, social,...) + Organizational environment (workplace, healthcare,...) + Societal environment (macroeconomy, legislation,...) → work ability Example: In this report, work ability refers to both individual and occupational factors that, according to research data, are essential to a person's ability to cope in worklife. Work ability is the result of the interaction between individual resources and work. A person's individual resources include health, functional capacity, education and know-how. The resources are also influenced by the person's values and attitudes, motivation and job satisfaction. A person realizes his or her resources at work, and the result is influenced by the work community and the work environment provide the proper conditions. On the other hand, a well-operating work community or work environment cannot fully compensate for weakened resources. A system of feedback also exists between work ability and its components. A person's resources receive feedback on how he or she manages at work. In this report work ability is defined as a dynamic process that changes through its components throughout life. In addition, a person's work ability is bound to the surrounding society and enterprise and to both immediate and micro networks (for example, family) [48]	Lifelong work ability, enablement process, promotion of work ability

theoretical shift in disability research that started in the 1980s with the emergence of a new conceptualization of the disability process [10–12], followed by the finding that social and work-related factors often have more impact on long-term work disability than physiological factors [13, 41]. The shift continued with the development of several theoretical models trying to grasp the interactions and/or relative contributions of impairment and function, sociodemographic characteristics, work-related variables, and broader societal and environmental conditions. The biopsychosocial [7, 42, 43], ecological [15, 44, 45] and other social constructivist

models [1, 16, 46] undergird the evolution of the discourse on work disability and the enlargement of its definitions to include contributions from various disciplines (psychology, sociology, medicine, etc.) and interdisciplinary research. These conceptual definitions, however, are usually vague on the specific relationships between the levels and dimensions or the mechanisms through which social determinants operate at the organizational or societal levels. In terms of causality, these definitions move away from the assumption that work disability is due to a medically defined impairment and recognize that it can also result from the loss of capacity

to work or earn an income or from an imbalance between work barriers and facilitators (lack of motivation, litigation with the employer, lack of qualifications, generous disability benefits, economic recession *versus* attractive salary, meaningful work, possibilities of job accommodation, thriving economy).

Finally, a fifth category of definitions reflected yet another theoretical shift that seems to have started in the late 1990s: from the prevention of work disability and barriers to employment to the promotion of work ability and return-to-work facilitators [46, 47]. This group of definitions tended to emphasize strengths rather than weaknesses and the enablement process rather than the disablement process. In this perspective, rather than being seen as a loss, work disability was often seen as a normal part of the work life and placed on a continuum varying over the life course from perfect health and work ability to death or complete work disability [18, 48, 49]. These definitions often also integrated multiple dimensions in a systemic and holistic perspective similar to the previous group of definitions presented above.

Conceptualization of Time: From Static to Dynamic

Over the years, the vision of work (dis)ability also seems to have become increasingly dynamic. However, current conceptualizations of temporality in regard to work (dis)ability varied greatly between the definitions.

A fair number of definitions saw work disability as a *punctual and static* work status or event either preceded and followed by a “regular state” (the “normal” or “full” life and activities) [53–56] or seen as a lifelong disablement with no possibility of evolution or recovery [57, 58].

Another common way of looking at work disability was to see it as *dynamic*. Different variations of the dynamic vision of work (dis)ability were found among the definitions. In some cases, work disability was considered to have *multiple phases* [59–61]. The vocabulary used to describe these phases often evoked a biomedical conceptualization of work disability as an impairment or an illness with its own natural history (e.g., acute, subacute, chronic, with or without a permanent stage). Others chose alternative terms (“short term”, “long-term”, “stage”, “transition”) to describe the phases of work disability, distinguishing themselves from the biomedical paradigm.

Finally, work (dis)ability was sometimes conceptualized as a *continuous* phenomenon [62–65], whether *linear* (linear progression of the work disability episode) or *recursive* (possible recurrences, periods of remission, and new work disability episodes). The most dynamic continuous conception of the phenomenon found in the reviewed definitions was the idea of a “*lifelong work ability continuum*” (48), usually defined as ranging from complete work ability

to complete work disability or death with different degrees of work (dis)ability varying on the life course as a “normal” part of life. This last way to conceptualize temporality was very prevalent in the definitions of work ability and completely absent from the definitions of work disability.

Note that when work (dis)ability was conceptualized as an event or a limited period, some definitions concentrated on a first or new episode only, while others included the idea of a possible *recurrence* of work disability and calculated its duration as the cumulative length of disabling episodes within a certain period. This last way of measuring the concept could also be seen as a step towards a more dynamic idea of work (dis)ability, as a continuum or a recursive phenomenon.

Another point on which the definitions differed was whether they referred to the past, present or future work situation in assessing or labeling work (dis)ability. Definitions oriented toward the *past* evoked work loss, capacity loss, preinjury work, previous salary or, more generally, the gap between what a person was able to do and can do now. Definitions assessing work (dis)ability in regard to the *present* situation did so through the actual work status, return-to-work process, current sickness absence, current productivity, performance, competitiveness or current functional limitations. Definitions oriented toward the *future* situation referred to the worker’s employability (possibility of employment), earning capacity (potential salary) or likelihood of return-to-work. These differences were often related to the main stake(s) emphasized by the definition. For example, compensation-oriented definitions usually tended to look at the past in terms of losses, while rehabilitation-oriented definitions would tend to assess employability.

A last point on which definitions differed was the setting of a minimal and maximal duration to be considered work (dis)ability, and whether or not it had to be permanent. Interestingly, many definitions associated the idea of work disability with the idea of a long-lasting phenomenon and set a minimal duration under which the term work disability couldn’t be used (often 6 months). In some definitions, a condition even had to be permanent to be called work disability. Conversely, some definitions included a maximal duration for work disability (often 6–36 months), after which it would be considered a distinct concept such as “permanent disablement” or “disability pension”.

Conceptualization of Work

Finally, the definitions diverged on *the notion of work* itself. Some definitions were very specific assessing work (dis)ability in regard to a specific job designated by a specific job title and within a specific workplace with or without work accommodations in terms of the worker’s

schedule, function, tasks or workstation. Broader and more stringent definitions would require not being able to hold any job in the same city, on the national labor market or even in the global economy in order to qualify as work disabled, acknowledging the systemic influence of the labor market in shaping work (dis)ability. Some definitions also included the unpaid work activities (volunteer, housework) as part of the work assessment, while others only referred to paid employment through terms like “gainful activity” or “earning a living”.

When work disability was seen as a work interruption, some definitions included an interruption in self-employment or a voluntary or involuntary work interruption secondary to the disability condition (e.g., unemployment, retirement, early retirement, or going back to school); others differentiated these situations from the situation of work disability. Some definitions also set minimal and maximal ages beyond which a person could not be considered as work disabled. Others considered anybody who wanted to work and could not as being work disabled, regardless of age or the official age range of the working population.

In this context, the notion of inability to work was broad, ranging from a total incapacity for work (e.g., absence from work), to a partial inability to work (e.g., able to fulfill certain tasks or reach certain goals). Distinctions between presence at work, fulfilling tasks and reaching goals are especially important from the employer’s point of view, as work (dis)ability represents a productivity issue, not only through absenteeism but also through presenteeism (i.e., workers return to or remain at work without being fully productive).

Discussion

Core Elements of Work (Dis)ability

The definitions analyzed in this study do not reflect a shared, integrated vision of the exact nature and attributes of work (dis)ability. However, except for a few definitions, there seems to be a consensus that work (dis)ability is a *relational* concept resulting from the interaction of *multiple dimensions* that overlap and influence each other through different *ecological levels*. The conceptualization of work (dis)ability also seems to have become increasingly *dynamic* over time. The concept map (Fig. 2) should be seen as a tool that begins integrating these levels and core dimensions (solid boxes), as well as optional additional dimensions absent from the reviewed definitions but suggested by the authors of the present paper based on their own clinical and research experience and on the theoretical models of work (dis)ability [1] (dashed boxes).

Differences between the definitions lie in which dimensions were emphasized, the boundaries and relationships between these attributes and the importance given to different external and contextual influences in shaping and creating work (dis)ability, from the most proximal, such as the working conditions or family settings, to the most distal, such as the global economy or the aging of the population. For example, our results show that much emphasis has been put on the individual and organizational levels and only a little on the societal level. When comparing the definitions within each level, we saw some degree of agreement. At the individual level, work (dis)ability is considered to entail physical and psychosocial factors, but some other key dimensions, such as the financial, vocational or cultural and symbolic dimensions of work, need further exploration or acknowledgment. At the organizational level, work demands and work environment are often considered but there remains a lack of discussion of what constitutes the work environment and of other contextual spheres, such as the insurance mesosystem, clinical care or family setting. More interestingly, there is little agreement in the present definitions on how context should be understood at either the organizational or societal levels, and how one level influences the others.

Implications for Research

Integration and Transferability

Researchers need to be aware of the wide range of work (dis)ability conceptualizations in research, from the most classic based on duration of disability benefits, pre- and post-injury employment comparisons, and results of standardized medical evaluations, to the most comprehensive considering the impact of work (dis)ability on various aspects of peoples’ lives and in their organizational, social, political and economic environments.

Different definitions shed different lights on work (dis)ability. However, this heterogeneity can sometimes unnecessarily impede the integration of research results or lead to misinterpretations if studies are compared without taking into account the differences in the conceptualization, evaluation and measurement of work (dis)ability, as well as their organizational and social contexts. For example, there are great differences in social security systems, work legislation and disability management policies across countries/jurisdictions and even over time within a jurisdiction. This influences the way work (dis)ability is defined, measured and recorded, as well as its eligibility criteria, which in turn makes comparisons between populations of compensated workers very difficult and limits the transferability of empirical evidence.

At the research planning stage, therefore, it seems essential for researchers to position themselves in regard to

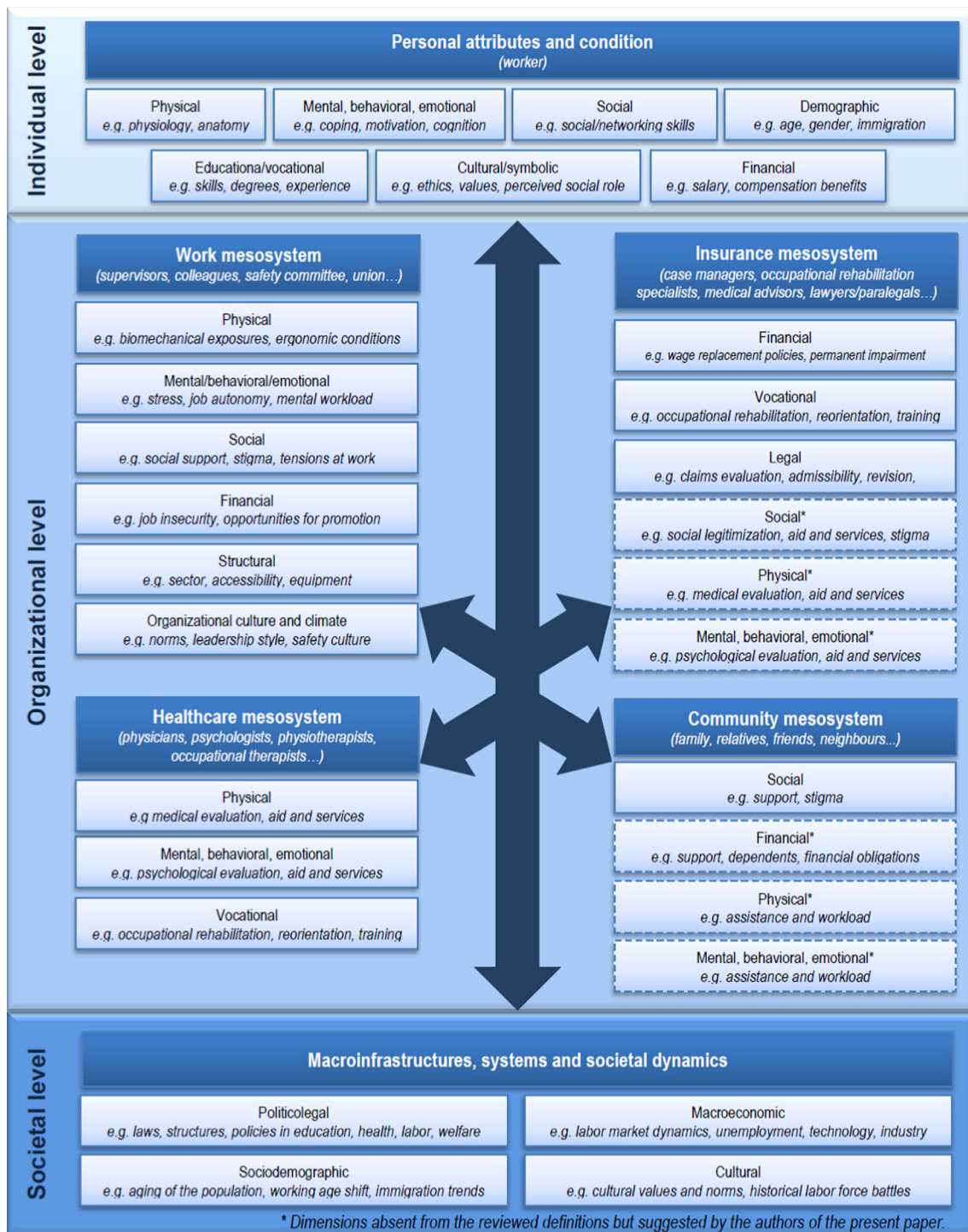


Fig. 2 Concept map of work (dis)ability as a relational concept resulting from the interaction of multiple levels and dimensions

the multiplicity of conceptualizations of work (dis)ability. The decision, conscious or not, to adopt a specific perspective on this phenomenon is not neutral [4, 21]. It affects the choice of certain indicators and specific methodologies, and addresses more or less comprehensively the priorities of different stakeholders. At the dissemination stage, it seems equally important to define explicitly the

meaning of work (dis)ability and to situate the study precisely in its contexts instead of assuming universality.

Measurement

As a corollary to the multiple dimensions of the concept, measuring work (dis)ability also poses the challenge of

selecting indicators that complement each other without excessive overlap. The questions that need to be addressed can be framed in terms of validity: do we really measure work (dis)ability (construct validity)? Do we measure all its dimensions (content validity)? Can work (dis)ability be predicted with the indicators that were selected (criterion validity)?

Several indicators were developed in the literature but, taken alone, none seem to satisfactorily capture the complexity of work (dis)ability situations [4, 5, 21, 66–68]. For example, the duration of compensation benefits as an indirect measure of work disability is the most widely used indicator of the impact of musculoskeletal disorders, the performance of caregivers and rehabilitation programs and the economic burden of work injuries [67]. It presents the advantage of being collected comprehensively and longitudinally by the worker's compensation boards for all compensated workers [21]. However, the end of the compensation period doesn't necessarily correspond to the end of work disability, or to a return to work [69]. Some workers exit the system because they reach the age of retirement, others because they are deemed "fit to work". Moreover, even if the terms "return-to-work" and "recovery" are often used as synonymous in studies, they don't always correlate. Many workers go back to work with modified tasks, lighter schedules or reduced abilities [70–72]. Furthermore, the compensation period between the injury and return-to-work doesn't take into account the durability of the return-to-work. We know workers often make several attempts before achieving a sustainable return-to-work [5, 73]. Depending on the moment or the period of measurement, the duration of disability, therefore, undergoes significant changes [21]. Even if the compensation duration is an appropriate measure of the financial burden of work disability for the insurer, it only gives a fragmented vision of its impact on the worker's professional and personal life and the costs to the employer, for example in the case of presenteeism.

This example illustrates the benefit of using several variables to grasp the multiple dimensions of work (dis)ability (e.g., duration of benefits, relapses, functional status), and other variables measuring dimensions uncovered in this review that are seldom or never measured in current research (e.g., level of productivity at work, functioning in personal life, well-being). These variables could be combined using multiple indicators or by creating an index combining several indicators, or could take the form of a validated scale of work (dis)ability simultaneously taking into account the different dimensions of the concept. The *work ability index* developed by Tuomi et al. [74] illustrates this last option. The concept map provided in Fig. 2 can assist the researcher in the choice of complementary indicators.

Prediction and Explanation

From a much wider perspective, identifying the dimensions of work (dis)ability delineates different areas for potential research in several disciplines (epidemiology, rehabilitation, social sciences, medicine, etc.). We need to consider if the dimensions uncovered in this paper are addressed by current predictive and explicative research and frameworks, and we can wonder if other dimensions or concepts are completely absent from the current definitions and should be added.

Conceptualizing work (dis)ability as a complex and multi-layered phenomenon poses new challenges for research. First, instead of the classic vision, centered on biomedical individual factors in a linear etiological perspective, work (dis)ability is increasingly seen as having multiple and tangled roots, individual as well as contextual [3, 44, 75–77]. Individual determinants are by far the most studied in epidemiology and rehabilitation in the areas of prediction, prevention, intervention and risk group identification. These determinants often include sociodemographic characteristics, medical history, employment and work disability history, physical and psychosocial job characteristics and various non-work-related psychosocial factors. Other determinants have been discussed at the organizational level (e.g., interaction between the worker and different disability stakeholders, disability management and culture in the workplace, work/family reconciliation) and at the societal level (e.g., influence of work disability policies, labor market, aging of the population, religious or cultural value systems), mainly in the sociological literature, but more research is needed.

Second, to consider work (dis)ability as a process or a dynamic life course characteristic rather than a static and invariable state has an impact on the study of its determinants. A growing number of authors in epidemiology [3, 78, 79] and other disciplines [80, 81] point to the importance of incorporating time into explicative and predictive models. This can be done by deconstructing enablement/disablement processes at play or by showing the phase-specificity of some determinants, either because they change during the process of work (dis)ability (e.g., pain, mental health) or because, despite staying unchanged, the size or the direction of their effect changes over time. For example, in long-term work disability attributed to musculoskeletal disorders, the role of functional status and physical determinants seems to lessen over time while psychosocial and contextual determinants seem to play an increasingly important role on return-to-work.

Third, moving from the idea of work disability to work ability also has an impact in terms of prediction and explanation, since the determinants of staying and maintaining work abilities at work may not be identical to the

determinants of returning to work after a period of work disability.

Finally, in the reviewed definitions, work (dis)ability was sometimes defined by its consequences (e.g., “sickness absence”, “the receipt of time loss payments”, “loss of employment”), sometimes by its determinants (e.g., “limitations in the amount or kind of work individuals can do”, “an employee’s physical, psychological, and social capacity to work”) and sometimes by the enablement/disablement process itself (e.g., “the inability or difficulty to undertake paid work activity”). However, in most cases, depending on the way the definition is phrased, it is difficult to disentangle from the definition which elements constitute determinants, parts of the process, outcomes or consequences of work (dis)ability. In terms of causality, it leaves unanswered questions such as: is work disability the fact that a person does not fulfill his or her work requirements or is it the factor that explains why a person does not fulfill work requirements?

Implications for Practice

Work Disability Compensation

The definition of work (dis)ability plays a critical role in determining the population of work disabled that, for example, will be eligible for monetary compensation or vocational rehabilitation. From the social insurance or medico-legal perspective, work (dis)ability is regarded through its legal and administrative consequences in terms of rights, responsibilities and compensation benefits. In this perspective, the role of the injured worker is very close to the sick role described by Parsons [82–84]. This “sick individual” is defined by the privilege of being excused from usual obligations of productivity and the right to social assistance, but must in return fulfill certain duties, such as trying to get better or cooperation with therapists. It is only then that the “deviance” (which disturbs the social function of the society) of the impairment is cancelled and it becomes a legitimate state [84].

So, from the social insurance perspective, the purpose of the definition is to find objective criteria to assess work (dis)ability in a way that is uniform and applicable to all citizens, in order to be fair and prevent “deviant” individuals from abusing the system. This is, however very reductionistic, since these administrative definitions usually ignore almost all dimensions of work (dis)ability except the ones related to medical impairments and sometimes certain job characteristics evaluated by healthcare or insurance professionals [36]. It does not consider that work (dis)ability can originate from other individual or contextual conditions such as weak labor markets, social support, work/family conciliation, individual work qualifications, motivation to work or coping abilities [85].

In reality, the issue originates from a conflict of models. The insurer insures and compensates a “damage” which in this case is an impairment. However, research has shown that work (dis)ability is only partially determined by impairment. Other factors (psychosocial, contextual, etc.) are not insured and the notion of work itself is often equivocal. For example, a worker can be considered work disabled at the pre-injury job but able to hold another type of job in the same or a completely different field [86]. However, he/she may not have the psychosocial skills and strengths to cope with a drastic career change. He/she may find the alternative careers incompatible with his/her family life, values or financial needs. He/she may have difficulties getting hired because of high unemployment rates, little or very specialized training, older age, etc. Who would thus be considered work disabled: the worker unable to go back to his/her previous job or the worker unable to hold any? Should this evaluation be based solely on physical health criteria or also on ethical, psychosocial and socioeconomic criteria too? Should it take into account only individual characteristics or also workplace accommodations and barriers, access to healthcare and job market characteristics? The forensic model, although very appropriate for goods (cars, houses, etc.) seems totally unsuited for “human damages”.

The assessment of work (dis)ability based solely on expert evaluations of a medically definable functional disorder is also problematic if we consider that the subjective evaluation by the worker himself is one of the best predictors of future work (dis)ability [87, 88] or that work (dis)ability is, in fact, the result of a decision [77]. As Gould et al. [17] put it, “*Ultimately, however, it is not a technical/administrative definition that determines who will or will not be coded as occupationally disabled: the final decision, and with it the practical sorting of occupationally disabled in the labour market, rests with the occupationally disabled who accept the coding on the basis of their personal behaviour that they eventually may come to understand as a sign of disability*”. In practice, this means that if the goal of the insurer is to diminish the burden of work disability on the society, other dimensions at play, including the subjective evaluation by the workers of their own work (dis)ability, cannot be ignored.

Prevention and Rehabilitation

Recognizing that work (dis)ability is multidimensional, and results not only from an individual condition (medical or not) but also organizational and societal conditions, has important implications for care givers, rehabilitation specialists and employers in terms of work (dis)ability prevention/promotion, rehabilitation and management. At the individual level, this enlarged vision of the issue can lead

to innovative ways to address the full spectrum of conditions positively or negatively affecting work retention and return-to-work (physical and mental health, but also, for example, education and skills, meaning of work, motivation, coping, well-being in other areas of life, financial incentives, networking abilities and other social skills, age and career stage, immigration and language barriers). It also enhances the potential for interventions addressing systemic barriers and incentives to work (dis)ability at the organizational and societal levels: for example, promoting best practices in the workplace before withdrawal from work or afterwards, in cases of worker reintegration, decreasing stigma towards work disability in the workplace, rehabilitating and reducing exposure in all areas of a worker's life (at home too), building interdisciplinary clinical teams, encouraging cooperation and coordination between all stakeholders (worker, care givers, relatives, insurance case managers, colleagues and supervisors, etc.) and at the societal level, comparing and evaluating public policies, work disability legislation and social structures between different jurisdictions/countries in the areas of employment, healthcare, work and disability legislation, and education, to understand their impact on a population's level of work (dis)ability. For employers, a narrower or broader legal definition of work (dis)ability may also have an impact on regulations related to discrimination in the workplace or legitimation of termination of employment.

Recognizing the dynamic nature of work (dis)ability implies paying attention to the timing of interventions in the process of work enablement/disablement and in the worker's career/trajectory, considering that interventions may need to evolve over time to match the new needs and challenges faced by workers and the changing nature of work (dis)ability, and taking the recursive nature of work (dis)ability into account when designing interventions.

Finally, conceptualizing the phenomenon in terms of work "ability" rather than work "disability" reflects a shift in the focus of interventions away from trying to target vulnerable workers, prevent work withdrawal and improve return-to-work outcomes secondary to work disability, and towards promotion of work retention and work abilities throughout the life course of all workers.

Towards an Integrated Framework of Work (Dis)ability

Following this exercise, it would be neither easy nor desirable to propose a unique definition of work (dis)ability which would meet all the needs and concerns (to classify, understand, measure) of different stakeholders evolving in separate contexts (legal, clinical, academic) and disciplines (rehabilitation, psychology, occupational therapy, biomechanics, etc.) with divergent and sometimes irreconcilable epistemological assumptions (positivists, constructivists,

etc.) and underlying paradigms (biomedical, biopsychosocial, ecological, etc.). From a theoretical perspective, however, this does not imply that efforts to achieve an integrative framework of work (dis)ability are pointless or naïve. Current reflections in the literature seem to indicate that certain paradigms and theories still widely in use (e.g., biomedical) no longer suffice to explain the complex phenomenon of work (dis)ability [1, 2, 7–9, 14, 15]. Certain theories appear to be more appropriate than others and some have even been refuted.

From this perspective, we support others who believe in the need to develop an integrative theoretical framework to describe the new paradigm of work (dis)ability [10–12] with its *multiple dimensions* at the *individual, organizational and societal levels*, as well as the *relational and dynamic* nature of work (dis)ability uncovered in this analysis. We argue that different perspectives from different stakeholders can be reconciled at least theoretically in one framework as long as we accept that: (1) the fragments of theories elaborated on specific aspects of work (dis)ability can be combined to give a greater understanding of the phenomenon; (2) among all the proposed theories or fragment of theories currently in use, some fit empirical observations better than others, and the ones that don't fit should therefore be discarded; (3) most theories have not yet been validated, falsified or even confronted with empirical observations; and (4) the framework reflects our current understanding of the phenomenon and will evolve over time. It doesn't mean each researcher or stakeholder should or could focus on the whole theory, but rather recognize where their actions/policies/research fit into a bigger picture while moving away from reductionistic models and explanations.

In our view, the present analysis, resulting concept map (Fig. 2) and grounded theory can be viewed as a preliminary step towards building an integrative framework of work (dis)ability based on current empirical evidence and theoretical models. It can also be a starting point for readers to examine or revisit their own current perspectives, interventions, approaches, frameworks or methodologies in a new light.

Methodological Considerations

This review used rigorous and systematic methodologies. It covered a myriad of databases through a wide spectrum of disciplines and research traditions providing an array of perspectives on work (dis)ability and a broad awareness of how practitioners, policy makers and academics conceptualize the phenomenon. In retrospect, some databases turned out to be less appropriate than others. Google Scholar provided the most comprehensive results as it gave the possibility to look for definitions in full text articles, as opposed to

titles and abstracts only, and across many databases at, once including Elsevier's Science Direct, Pubmed, JSTOR, SpringerLink, Wiley InterScience and Informaworld. Although there was no time limit, it is possible that older relevant records were missed if they weren't indexed in full text or hadn't been cited by a more recent paper indexed in full text. Nevertheless, the comprehensive nature of the quest and the multiple duplicate records between databases reduce the risk of missing critical citations.

During the analyses, the classification process was not always straightforward. Some factors were on the edge of two or more dimensions. Transparency on the content of each dimension and consistency in the categorization of comparable elements ensured a uniform classification.

An important feature of the grounded theory is that it leads to a set of integrated hypotheses, rather than to a report of facts. Therefore, its quality should be assessed in regard to fit, relevance, workability and modifiability [24], rather than validity. Fit is how much the concepts suit the elements they are representing. A relevant study deals with real stakeholders' concerns and is not only of academic interest. Workability is reached when the theory explains the problem with variation. Modifiability is the idea that a theory is always transformable, questionable and disputable when confronted to new relevant data. Readers of this paper are invited to assess its quality in regard to these principles.

Conclusions

This paper explored the notion of work (dis)ability as it is understood today. Our motivation came from the observation that the meaning of the term is currently largely unsettled, as shown by the variety of definitions and lack of shared understanding. This paper contributed to a more in-depth understanding of this complex concept, its levels, dimensions and temporality through the systematic review of currently published definitions.

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