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Similarities and differences in Swiss general practices with and without nurse practitioners

Multiple case study design

Margarithe Charlotte Schlunegger[1,2] · Rebecca Palm[2,3] · Maya Zumstein-Shaha[1,2]

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Abstract

Background New care models are needed for the increasing elderly, chronically ill, and multimorbid population, especially in primary healthcare. Rural regions are particularly affected where bottlenecks in provision of care and a shortage of health professionals are emerging. To address these challenges, nurse practitioners have been implemented in Swiss general practices to improve primary healthcare of chronically ill people.

Aim We aimed to explore Swiss primary healthcare delivery for chronically ill people in general practices with and without nurse practitioners and identify similarities and differences in these general practices.

Methods We conducted multiple case studies. Data were collected using interviews, observations, patient records, and questionnaires. We described the similarities and differences by drawing on Wagner's Chronic Care Model and applied deductive thematic cross-case analysis. We included five general practices located in rural areas in Switzerland, with nurse practitioners in two general practices. A total of 34 patients and 26 health professionals were included. The Enhancing the QUAlity and Transparency Of health Research (EQUATOR) reporting standards for organizational case studies were used.

Results Similarities were that chronically ill patients valued to be perceived as a whole person; guidelines for multimorbidity and reimbursement of relevant services such as coordination were limited. Differences in general practices with nurse practitioners were unclear role allocation, criteria for patient referral were missing and interprofessional teams were in an extended process of change. Nurse practitioners provided a bridge between the general practices and local home healthcare organizations, thereby, strengthening interface management and obtaining a more comprehensive nursing perspective.

Conclusion This study highlights that new models of care can better respond to patients' needs as additional nursing skills are available. Interprofessional teams undergo substantial changes in the new care model requiring a revision of existing structures.

Keywords General practices · Interprofessional team · Multiple case study design · Nurse practitioners · Primary healthcare

Background

New models are needed for the care of the increasing elderly, chronically ill, and multimorbid population (World Health Organization [WHO] 2020). There is a shortage of health professionals in primary healthcare (Merçay et al. 2021). Rural regions are particularly affected and bottlenecks in provision of care are emerging (Barnes et al. 2018; Cerny et al. 2016). To address these challenges, nurse practitioners (NPs) have been implemented in Swiss general practices to improve primary healthcare of chronically ill patients. New roles need to be explored in relation to each healthcare system, as they may differ in context factors

✉ Margarithe Charlotte Schlunegger
margarithe.schlunegger@bfh.ch

1 Department of Health Professions, Applied Research and Development in Nursing, Bern University of Applied Sciences, Bern, Switzerland

2 School of Nursing Science, Faculty of Health, Department of Nursing Science, Witten/Herdecke University, Witten, Germany

3 Department of Health Care Research, Carl von Ossietzky University Oldenburg, Ammerländer Heerstr. 114–118, 26129 Oldenburg, Germany

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such as professional standards, regulatory requirements, or the country's culture (Tracy and O'Grady 2019).

NPs are qualified nurses with Master's degrees in nursing (International Council of Nurses [ICN] International Council of Nurses 2020). This educational program has been available in Switzerland since 2000 (Keinath et al. 2023). In contrast to other countries, such as the USA, the NP role in Swiss general practices is in the pioneering phase (Bryant-Lukosius et al. 2016a; Gysin et al. 2019). General practices in Switzerland most often consist of one general practitioner (GP, i.e., physician) and medical practice assistants (MPA; Josi and De Pietro 2019). However, more and more general practices comprise several GPs with several MPAs and are part of general practice networks spread out across Switzerland. These practices currently employ 50% of nonphysician professionals. However, only 25% of these practices include professionals with advanced practice roles in nursing, physical therapy, occupational therapy, and/or nutrition counseling (Josi and De Pietro 2019). The lack of clearly delineated scopes of practices and reimbursement plans constitute main barriers, as these are crucial to effective interprofessional collaboration in new primary care models (Josi et al. 2020; Zumstein-Shaha et al. 2022).

In Swiss primary healthcare, only a few general practices employ NPs who predominantly take care of chronically ill patients (Gysin et al. 2020a; Steinbruchel-Boesch et al. 2017). In these cases, NPs contribute to improvement of chronic disease management, particularly of patients with complex needs, thereby achieving high patient satisfaction (Gysin et al. 2019; Zumstein-Shaha et al. 2022). NPs exhibit a high degree of autonomy during home visits and rounds in nursing homes (Gysin et al. 2020b; Josi and Bianchi 2019; Steinbrüchel-Boesch 2019). Nevertheless, the NP role and responsibilities remain vague, which reduces role acceptance (Josi et al. 2020).

With increased age, patients may suffer from more than one chronic disease at once (WHO 2002). The burden of multimorbidity includes a wide range of medications, quality of life impairments, and periods of acute exacerbations, which are followed by chronic states (WHO 2020). Chronically ill patients, therefore, require more than GP visits. To manage multiple diseases and to find adequate ways of living with the disease, patients may need services from various healthcare professionals, particularly when they live in their homes. Wagner's Chronic Care Model (CCM; Wagner 1998) allows for a general understanding of the care of chronically ill patients living at home. The CCM is used as a frame of reference for our study. According to this model, patients with multimorbidity need care from the multidisciplinary healthcare team (Wagner 2000). However, NPs have yet to be integrated into the CCM.

The integration of NPs into healthcare systems is at various stages of progress around the globe (Maier et al. 2017). Confusion persists in distinguishing NPs from other health professionals working in general practices, particularly in countries where NPs are just emerging. It remains an open question whether and how general practices with and without NPs differ in healthcare delivery to chronically ill patients in Switzerland.

Aim and research question

Our goal was to identify similarities and differences in general practices with and without nurse practitioners. The following research question should be answered: what are the similarities and differences of general practices with and without NPs concerning the primary healthcare of chronically ill patients in Switzerland?

Methods

Design

To address the research question, multiple case studies were conducted (Yin 2018). This design allowed for multiple data collection methods, which yields in-depth descriptions of complex healthcare roles (Begley et al. 2010; Bryant-Lukosius et al. 2016b; Lalor et al. 2013). A particular characteristic of multiple case studies includes the use of various data sources such as qualitative data emerging from interviews, observations, or patient records as well as quantitative data originating from questionnaires. A case study, therefore, draws on multiple sources of evidence, whereas the focus of this study was on the qualitative data (Yin 2018). The reporting of the study followed the Enhancing the QUAlity and Transparency Of health Research (EQUATOR) reporting standards for organizational case studies Rodgers et al. (2016) (Supporting information 1).

Case definition and case boundaries

We defined each general practice as one case. Each case, then, represented a concrete organization in the real world (Sandelowski 2011; Yin 2018). The temporal boundaries of the case corresponded to the project duration from 2020–2022. The spatial boundaries of the cases were defined by the objective.

Setting and participants

We selected a purposive sample based on the defined cases (Yin 2018) and five general practices in German-speaking Switzerland were recruited. These general practices were located in rural areas, of which two were alpine areas. As

Table 1 Inclusion and exclusion criteria

Participants	Inclusion criteria	Exclusion criteria
General Practitioner	Have a medical specialist degree Are active in clinical practice	Less than 1 year of experience in the general practice
Nurse Practitioner	Have a master's degree, or being in the Master of Science nursing program at the time of the study Are active in clinical practice	Highest level of education is CAS (Certificate of Advanced Studies), DAS (Diploma of Advanced Studies) or MAS (Master of Advanced Studies) Less than 1 year of experience in nursing
Medical Practice Coordinator	Federal certificate of proficiency as Medical Practice Coordinator or Medical Practice Assistant Are active in clinical practice	Less than 1 year of experience in the general practice
Medical Practice Assistant	Federal certificate of proficiency as Medical Practice Coordinator or Medical Practice Assistant Are active in clinical practice	Less than 1 year of experience in the general practice
Patient	Age > 65 years, Chronic diseases increase with age (BAG 2024) Diagnosis of one or more chronic diseases, existing for several years Living in a private household Medical and nursing care by general practice	Cognitive impairment, such as dementia development (according to medical history) Insufficient knowledge of German for oral communication

ensuring primary healthcare in rural and alpine areas is presently at risk, we were particularly interested in these areas (Barnes et al. 2018; Cerny et al. 2016). Two of the general practices included a single NP each. Both NPs worked part-time and, therefore, cared for a limited number of patients. The inclusion and exclusion criteria for participants are shown in Table 1.

Data collection

We used qualitative data collection methods to create vignettes per case. First, one of the authors (MCS) conducted unstructured observations to become familiarized with the field, to get to know daily practices, and to observe interprofessional collaboration. Second, semistructured interviews, comprised of questions about medical and/or nursing activities, problems or opportunities in the care process for chronically ill patients, and collaboration in general practices, were conducted with all health professionals. Patients were also interviewed about their current health condition, coping with daily life, and the care by the health professionals in the respective general practice. The interviews were conducted by several researchers (MCS, SA, DZ, CT, LF). Field notes were taken before and after the interviews. All interviews were transcribed with MAXQDA 2020 (VERBI Software GmbH, Berlin, Germany; MAXQDA The Art of Data Analysis 2020). Third, the number and types of treatments, as well as activities of the health professionals, were extracted from the records of the participating patients. Data extraction was performed by two researchers (MCS, DZ).

Finally, sociodemographic data and a total of five questionnaires were deployed to health professionals and patients to obtain additional descriptions of the case context. We assessed patients' symptom burden and quality of life. The patients as well as the health professionals were able to assess the interprofessional collaboration in the general practice. The questionnaires were completed by hand. All questionnaires had been validated in German and were used

Table 2 Overview of data collection

Data collection methods		
Case vignette	Observations	131 h
	Face-to-face interviews with patients	34 Interviews
	Face-to-face interviews or focus groups with health professionals	22 Face-to-face 4 Focus groups
	Patient records	34 Records
Case context	Questionnaires (patients) EQ-D5-L5 (Herdman et al. 2011) Edmonton Symptom Assessment Scale (ESAS; Bruera et al. 1991) Swiss Interprofessional Evaluation Tool (SIPEI; Schmitt et al. 2020; Wagner et al. 2019)	32 Questionnaires
	Questionnaires (health professionals) Assessment of Interprofessional Team Collaboration Scale (AITCS; Orchard et al. 2018) Swiss Interprofessional Evaluation Tool (SIPEI; Schmitt et al. 2020; Wagner et al. 2019)	47 Questionnaires

with the developers' consent. Case contexts were used to illustrate the general practices in detail (Yin 2018).

Data collection took place between February 2020 and July 2021 and was conducted by the first author (MCS) and research assistants (SA, DZ, CT, LF). For an overview of the data collection, see Table 2.

Cross-case analysis

The analysis was conducted in two phases: namely the inductive within-case analysis and the deductive cross-case analysis. The within-case analysis has been published elsewhere (Schlunegger et al. 2022a). In this paper, the deductive cross-case analysis will be presented. With the cross-case analysis, similarities and differences in the cases were identified (Yin 2018).

Case vignettes were established as texts based on the data from the respective general practice (Schlunegger et al. 2022a). These texts were treated with thematic analysis according to Braun and Clarke (2006). Themes were formed deductively using the categories of the CCM as codes (Wagner 1998), namely community, health systems, and productive interactions. Subsequently, tables were created for each general practice using the categories of the CCM as main themes. Each theme of these tables was then contrasted to determine similarities and differences between the cases. From that step, all similarities and all differences were compiled into separate tables. For the analysis, Microsoft 365 Excel (Redmond, WA, USA) was employed.

For the case contexts, all questionnaires were treated according to the developers, and descriptive statistics were applied to determine frequencies. The different questionnaires were analyzed separately for each case. The descriptive statistics were carried out with IBM SPSS Statistics (version 28.0.1.0; Armonk, NY, USA).

Ethics approval

All participants were informed orally and in writing about the study. Informed consent was obtained from each participant. The participation was voluntary, and participants could withdraw from the study at any time without any explanation. All data were treated confidentially and stored securely, with access only by the research group. All procedures were performed in accordance with relevant guidelines and regulations. A jurisdictional inquiry to the Cantonal Ethics Committee, Bern, Switzerland confirmed that this research project does not need ethical approval but fulfills the general ethical and scientific standards for research with humans (Req-2020-00160).

Table 3 Characteristics of the healthcare professionals

	General practice A	General practice B	General practice C	General practice D	General practice E
Number of interviewed healthcare professionals (n)	8	9	4	4	4†
Gender					
Female	7	8	3	2	3
Male	1	1	1	2	1
Age in years	19–56	23–66	29–57	22–53	23–52
(mean)	(35.6)	(47.2)	(43.8)	(32.3)	(41.7)
Professions					
GP	1	2	2	2	2
NP	1	1	0	0	0
RN	2	2	0	0	0
MPC	0	1	2	1	1
MPA	2	1	0	1	1
Nurse assistance	2	2	0	0	0
Work experience (years)	1–20	1.5–47	9–30	3–25	4–33
(mean)	(11.0)	(20.6)	(20.0)	(11.8)	(20.0)
Workload (%)	20–100	40–100	55–100	40–80	60–100
(mean)	(81.3)	(84.6)	(89.0)	(70.0)	(83.0)
Workplace					
General practice	3	4	4	4	4
Home healthcare	4	4	0	0	0
General practice and home healthcare	1	1	0	0	0

GP general practitioner, *NP* nurse practitioner, *RN* registered nurse, *MPC* medical practice coordinator, *MPA* medical practice assistant
† No information from one person on age, work experience, and workload

Table 4 Characteristics of the patients

	General practice A	General practice B	General practice C	General practice D	General practice E
Number of patients interviewed (n)	7	8†	7	8	4
Gender					
Female	3	4	3	5	4
Male	4	2	4	3	0
Age in years	65–84	70–91	67–78	67–89	78–79
(mean)	(71.1)	(79.50)	(73.9)	(75.1)	(78.5)
Living situation					
Lives with partner or family	5	1	7	6	2
Lives alone	2	4	1	2	2
Other	0	1	0	0	0
Needs support at home					
Yes	3	5	1	3	2
No	4	1	7	5	2
Gets support at home from					
Relatives	3	4	0	3	2
Health service	2	5	1	1	0
Frequency of support					
1 to 2 per week	0	2	1	2	1
3 to 4 per week	1	0	0	0	0
≥ 5 per week	2	3	0	1	1
Common medical diagnoses					
Endocrine disease	6	0	6	6	3
Cardiovascular disease	4	1	6	7	2
Musculoskeletal disease	2	4	1	5	3
Oncological disease	0	0	1	0	0
Mental disease	0	0	0	1	2
No information	0	2	1	0	0
Medications per day					
0	1	2	2	1	1
1–2	1	0	0	2	1
3–4	2	0	0	1	1
≥ 5	3	4	4	4	1

†No sociodemographic information from two interview patients

Results

Participant characteristics

A total of 29 professionals were interviewed (23 women). Work experience ranged from 1 to 47 years. NPs worked in two general practices, one each. Additionally, registered nurses (RNs) and nursing assistants from the home healthcare agency in the area of the general practices with the NPs were interviewed. The two NPs worked part-time in the respective local home healthcare organization (Table 3).

In total, 34 patients were interviewed (19 women). About one third ($n = 11$) of the patients lived alone at home and needed support. Another 9 patients received support from home healthcare services. Endocrine disorders ($n = 21$) and cardiovascular diseases ($n = 20$) were predominant (Table 4).

Case contexts

According to the ESAS, the most common symptoms of patients were tiredness (2.8 mean), pain (2.6 mean), and lack of appetite (2.3 mean). Patients often had limitations due to pain/discomfort ($n = 18$) and impaired mobility ($n = 16$). Patients in general practices without NPs rated their health according to the EQ-D5-L5 as very good (i.e., mean for GPs without NPs: 84.3, 79.4, and 83.8, respectively) compared to patients in general practices with NPs (i.e., mean for GPs with NPs: 60.0 and 69.0, respectively). Interprofessional collaboration as measured by the AITCS and SIPEI was

considered positive by most healthcare professionals. Areas of optimization included coordination of interprofessional activities or having access to education on interprofessional collaboration. Patients also rated the interprofessional collaboration among the health professionals as positive. The questionnaire results per case are presented in Supporting information 2.

Similarities and differences in general practices

A total of three themes emerged and are presented below. These themes are based on the CCM's main categories, namely community, health systems, and productive interactions.

Community

According to the CCM, resources and strategies prevailing in the respective community are essential knowledge to plan for adequate healthcare (Wagner 1998). In this theme, information about the local community were compiled. These included the fact that the participating general practices were well established in the respective community. Also, the importance of networking among various healthcare services in the community was recognized. Equally important was that the general practices included sufficient healthcare professionals.

Similarities

All general practices had been established for years in the respective locations. The shortage of healthcare professionals had increased over the years. These staff shortages and unfilled positions kept the teams busy, as the observations demonstrated. One GP stated:

> "We must take care of the next generation. Not only in the field of medicine, in the field of rural primary healthcare. But we also must make sure that we continue to function as a team." (GP 5)

Patients noticed the shortage of healthcare professionals. However, they much appreciated the local care provided. One patient maintained:

> "Doctors do not like to go to work in the countryside. But we are lucky to have a group practice in the village. That's nice, that you do not have to go into the city." (Patient 18)

Differences

According to the observations, most general practices were located in the same building with other healthcare services such as home health care. This was perceived as a great added value. One medical practice coordinator (MPC) said:

> "Being under one roof makes things much easier because you can quickly go over to home healthcare and clarify questions." (MPC 2)

When health services were located in other parts of the area, NPs provided a bridge. As a result, interface management was improved, and more information on the patient's home situation was transferred to the general practice. One GP explained:

> "I think, ever since the NP has been present, there has been more feedback. Communication may have changed a little bit. But we have also learned more about how patients function at home." (GP 2)

Observations, interviews, and patient records revealed that the NPs use their network to provide optimal care for patients. An observation situation in a patient's home demonstrates: Until the arrival of the NP, one patient with particularly complex dressings and bandages was cared for at home by the home healthcare team. Subsequently, the NP visited this patient at home and discussed the situation. Together, the patient and the NP decided that the patient needed to see the NP in the general practice later on. The NP was better equipped with materials at the general practice. It was also easier for the NP to arrange for referral to wound experts in the general practice.

Health systems

According to the CCM, self-management support, delivery system design, decision support, and clinical information systems are important (Wagner 1998). In this theme, issues concerning health systems were compiled. These included the defining of roles and distribution of tasks, conducting effective self-management support strategies, integrating evidence-based guidelines, sharing information, and coordinating care.

Similarities

Chronic care was perceived to be challenging for all general practices. For example, health professionals cited the lack of guidelines for multimorbidity, the increased need of coordination, and the growing administrative workload. Similarly, reimbursement for the new roles (e.g., NPs) was not regulated for the general practices. Therefore, coordinative tasks for chronically ill patients could not be billed, neither by the GPs or the NPs.

All GPs in the participating general practices saw themselves as guides for the patients, and they conducted the medical management from A to Z. One GP described:

> "You are the person who keeps the overview and has things under control. Something important is coordination when special disciplines are involved." (GP 6)

GPs had the final responsibility. With NPs and MPCs, the GPs experienced relief in their daily work. Medical practice assistants (MPAs) and MPCs were perceived to be the pillars of general practice. These professionals were mainly responsible for organization within the general practice. According to the observations, the tasks of MPAs and MPCs were clearly delineated. These included, for example, telephone triage, lab work, and minding the reception desk. MPCs additionally provided specific education on blood sugar testing for stable, chronically ill diabetic patients. Most chronically ill patients had routine check-ups every 3 months. During these check-ups, MPCs used checklists to monitor the patients' health status. Both observations and interviews revealed that MPCs provided delimited care and counseling to the chronically ill patients. Specifically, MPCs were allowed to advise chronically ill patients with type 2 diabetes mellitus in stable condition. More complex patient situations or patients with instable chronic disease presented too many challenges for MPA and MPC counseling. Similarly, MPCs were not well equipped to advise patients with other chronic conditions, such as chronic obstructive pulmonary disease (COPD) or heart failure, as is illustrated by one of the MPCs:

> "For me, the hardest thing is to advise people when they come up with things that are not my specialty. I can offer advice when it comes to diabetes. But most of the time it is like: can you look here, I have yet another problem." (MPC 4)

In these situations, MPAs and MPCs handed the patients over to the GPs. Each general practice had an internal electronic information system. Analysis of patient records showed that this system facilitated communication as well as collaboration among the healthcare professionals.

Differences

The tasks and processes of NPs were less clearly delineated according to the interviews, the patient record analysis, and the observations. One NP described:

> "In the beginning, there were sometimes misunderstandings, who takes over which tasks, what does the doctor do, what do the MPAs do, and what do I do." (NP 1)

As time went by, NPs took more and more care of patients in stable, unstable, and complex situations. However, building a patient base for NPs proved difficult because she was only working part-time in the family practice and referral criteria were not clear to the team. Observations and interviews illustrated these difficulties. NPs introduced a comprehensive patient-centered, nursing perspective into the general practice, which was new for everyone. They also responded to the nursing needs that emerged in general practice. They provided support in the form of coaching or consultations to the home healthcare agencies associated with the respective general practice and the associated nursing homes on issues in nursing care. In the general practice or on home visits, NPs discussed chronic disease management and self-management at home with patients more frequently than GPs. For this purpose, NPs provided patient education on new skills such as completing the dressing of a wound at home. These issues were rarely or insufficiently addressed up until the moment NPs became part of the general practice. One of the NPs stated:

> "A patient, chronically ill, multimorbid, with diabetes and cardiac failure, and neglected, had decompensated due to his various diseases. He now comes to see me regularly in the general practice or I go on home visits. He has stabilized sufficiently, is now taking care of himself, and is again socially active." (NP 2)

Both observations and interviews showed that home visits were handled differently in every general practice. For example, in one general practice, home visits were only conducted when patients were immobile. Structured and regular exchanges with staff from home healthcare and nursing homes was missing in some general practices. The lack of a common electronic information system and electronic patient records across various healthcare providers, including home healthcare, was one contributing factor. In addition, the right to access for healthcare providers in- and outside the general practice to these electronic resources varied widely among the participating general practices.

Productive interactions

In order to work toward the informed, activated patient and prepared, proactive practice team as part of the CCM, productive interactions were considered important (Wagner 1998). In this theme, issues concerning interprofessional relations among the various healthcare providers as well as patients were summarized. These included trust and collaboration.

Similarities

All patients of all participating general practices maintained that they wanted to be perceived as a whole person. They found that the general practices were friendly and had a family atmosphere. Patients trusted the healthcare providers and valued continuity. One patient stated:

> "I feel well taken care of. They (team) are so uncomplicated. Occasionally, they give me the medication for my husband to take home. So, you are not just a number." (Patient 16)

Across all general practices, the GPs had trust in the teams. Interactions within the teams occurred in an appreciative manner. Overall, the health professionals were passionate about their work. One GP explained:

> "We love what we do. Yes, we don't think of it so much as work as it is our job. The profession has something to do with vocation. We also feel here, in practice, a high degree of team spirit and idealism." (GP 6)

Differences

In general practices with NPs, the GPs had trust in the NPs. However, adjustment to the new model of care required substantial re-organization of the processes so far established in the general practices. There were higher professional and personal demands placed on NPs because they were new to the team. In contrast to the NPs, the MPCs were more likely to have problems with challenging communication in specific patient situations as was found in the observations and the interviews. One MPC stated:

> "There are people with whom it is quite simple and straight forward to have a nice conversation, who do what you tell them. And then others question everything. I think it is very important to make people their own coaches of their illness so that they have enough information." (MPC 3)

GPs were seen as the main reference person for health issues. Therefore, patients perceived frequent changes of GPs in some general practices to be worrisome. In the general practices with NPs, patients were more likely to perceive the NPs as the reference person. In addition, patients saw differences between the NP and other healthcare professionals, e.g., concerning expert knowledge. Most of these cases involved patients who received home visits. One patient explained:

> "It seems to me that what she (NP) is saying, makes sense. I have noticed that several times. And she just has a way with people. She knows quite a bit. She really knows more than the other health professionals." (Patient 11)

Discussion

Summary of the results

Our goal was to identify similarities and differences in general practices with and without nurse practitioners in primary healthcare of chronically ill patients. Across all general practices, patients were found to value healthcare close to home. They wanted to be perceived as a whole person. Exchanges and interfaces with other healthcare providers were more improved with geographical proximity. All general practices were challenged in the care of chronically ill patients as evidence-based guidelines for multimorbidity and reimbursement of relevant services such as coordination are limited. Differences included adjustments in interprofessional team processes to account for the new role of the NP. For that, criteria for patient referral were missing, and role clarity and scope of practice had yet to be developed. With the NP, general practices obtained a more comprehensive nursing perspective. Health promotion, prevention, and self-management were strengthened. NPs provided a bridge between the general practices and local home healthcare organization, thereby, strengthening interface management.

Interpretation and comparison with existing literature

Patients have confidence in the general practice and want to be treated as a whole person. Shortage of health professional threatens these expectations and necessitate the introduction of new models of care (WHO 2020). During their continuing professional development, MPCs obtained more knowledge on clearly delineated aspects of diseases, e.g., diabetes mellitus. Therefore, MPCs encounter difficulties in the complete care of chronically ill patients. An overview of the entire patient situation is rarely possible (Gysin et al. 2020a). In contrast, NPs are able to provide comprehensive care to any patient population (ICN 2020). Particularly, patients in unstable, complex situations at home and in the general practice profit from being treated by NPs (Gysin et al. 2020b; Horrocks et al. 2002; Josi and Bianchi 2019). In addition, NP introduce the nursing perspective, which has been missing so far in general practice. As a result, patients' needs are met (ICN 2020). The number of patients in complex and unstable situations is expected to increase. Without new roles, it will be difficult to provide adequate care to this patient group (Gysin et al. 2020a; Josi & Bianchi, 2019). The care of chronically ill patients requires interprofessional teams, where each profession is able to carry out the competences to the full extent of the respective scope of practice (ICN 2020; Körner et al. 2016). Such teams need to be fostered, particularly regarding collaboration and communication (Josi et al. 2020; Pullon et al. 2016). Therefore,

training of interprofessional collaboration is mandatory for general practices incorporating new models of care and adequate reimbursement structures are essential (SAMS 2020).

Interprofessional collaboration within general practice teams has expanded with integration of NPs. Trust needs to be built as a basis for further collaboration. The healthcare team is one of the most important facilitating or inhibiting factors for the implementation of NPs (Torrens et al. 2020). Hierarchical relationships between GPs and NPs are also not conducive to successful role implementation (Torrens et al. 2020). Legal regulation of responsibilities can justify these structures to some extent. According to law, GPs hold the responsibility concerning decisions on diagnostics and treatments (SAMS 2020). However, GPs also have the potential to advance interprofessional collaboration and NP role implementation in general practices. GPs believing in the new role and its positive impact on patient care are facilitators (Torrens et al. 2020). In our study, the GPs with NPs support this model. However, it is essential for these GPs that the roles of the NPs, the MPCs and the MPAs are clearly delineated. Sometimes, confusion about responsibilities existed leading to uncertainties. Lack of role clarity and responsibilities can impede interprofessional collaboration in primary healthcare (Rawlinson et al. 2021). In countries with well-established NPs, the role is clear and understood, whereas confusion and a need for clarity remain in countries with more recently developed NP roles (Schlunegger et al. 2022b). The definition, meaning, and operationalization of Advanced Practice Nursing varies across Europe (De Raeve et al. 2024). Significant differences in the definition and requirements of NPs have been identified, leading to different perceptions of the competencies associated with this role and the scope of practice (De Raeve et al. 2024). In the USA, where this role is established, only 10% of the NPs report that their roles are unclear. However, 16.3% of NPs find that their competencies are misunderstood by their team (Poghosyan et al. 2017). In our study, in addition to role confusion, NPs have difficulty building a patient base. This can be due to lack of clear criteria to facilitate referral to NPs. In the participating general practices, referral of patients to other healthcare professionals such as the NP or the physical therapist, depends on the GPs. Such elements like GP preferences, organizational leadership, and the relationship between NPs and GPs are contributing factors to facilitating the referral process (Fraze et al. 2020). In the USA, 40–65% of NPs report having their own patient base (Fraze et al. 2020).

Conclusion

The results of this study highlight that new models of care can better respond to chronically ill patients' needs as additional nursing skills are available such as self-management or promotion of health. For NPs, the new model of care is exciting with possibilities to work to the fullest extent of their scope of practice. The findings of this study contribute to role clarification in new models of care, especially in countries where new roles such as NPs are emerging. The interprofessional team in general practices undergoes substantial changes in the new care model requiring a revision of existing structures. Further work is urgently needed to explore the adaptation of existing general practice structures. Implementation research provides a way to examine outer and inner settings, processes, and individuals. As an example, using qualitative studies per general practice, the influencing factors, and interfaces can be described based on the Consolidated Framework for Implementation Research (CFIR; Damschroder et al. 2009). Thus, the process of referring patients to NPs, which remains challenging, can be examined in more detail.

Strengths and limitation

Reporting of the study followed the EQUATOR reporting standards for organizational case studies (Rodgers et al. 2016). There are three points to consider when interpreting the results: first, the study was conducted in the German-speaking part of Switzerland during the COVID-19 pandemic. Socially desirable responses may have occurred, and any criticism may have been withheld because all participants had a positive attitude towards the study. Due to the small number of NPs and MPCs in rural areas, a balanced number of patients and general practices could not be achieved. Second, from our perspective, the research question, topic, and qualitative and quantitative methods were appropriate. We used a clear case definition. Such an approach allowed for detailed presentation of one or more cases of interest by combining different research methods (Yin 2018). Third, we tried to be transparent in the description of the data analysis. To avoid over- or underinterpretation of the data, we used peer-groups and reflective exchanges between the authors.

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Conflict of interest M.C. Schlunegger, R. Palm and M. Zumstein-Shaha declare that they have no competing interests.

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