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Characteristics and Activities of Nurses in Expanded Roles Employed in Swiss Nursing Homes: A Cross-Sectional Study

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ABSTRACT

Background: As the number of nursing home residents with multiple healthcare needs grows, the demand for nursing expertise increases. The implementation of new care models involving nurses with expanded roles is crucial for ensuring quality care in nursing homes.

Objectives: To investigate the characteristics and activities of nurses employed in nursing homes in expanded roles and the factors associated with variation in the activities performed.

Methods: This multicentre cross-sectional survey in Switzerland collected data from a convenience sample of 118 nursing homes between September 2018 and October 2019. From a subsample of 62 nursing homes, we analysed the characteristics and activities of 104 nurses in expanded roles. Associations between the activities performed and the educational background of the nurses in expanded roles, their direct supervisors' positions and the presence of physicians in the nursing homes were examined.

Results: Most Registered Nurses in expanded roles were diploma educated (48%), with fewer having a bachelor's (35%) or master's degree (17%). Overall, direct clinical practice and guidance and coaching activities were conducted monthly to weekly; consultation, evidence-based practice, collaboration and ethical decision-making activities were conducted monthly. We saw variations where a higher educational background was associated with more frequent evidence-based practice activities ($z = 3.47$, $p < 0.001$), and if direct supervisors were ward managers, nurses in expanded roles worked more frequently below their scope of practice ($z = 4.10$, $p < 0.001$).

Conclusion: This is the first study to use Hamric's integrative Advanced Practice Nursing model to examine the activities of nurses in expanded roles in nursing homes. We found considerable variation in their activities, where nursing homes seem to adapt their roles to their educational background and the local context.

Implications for Practice: Our findings show the importance of clarifying role expectations for Registered Nurses in expanded roles, allowing them to practice at the top of the licence to meet residents' complex healthcare needs.

Summary

What Does This Research Add to Existing Knowledge in Gerontology?

- Nursing homes (NHs) introduce new care models that involve nurses with different educational backgrounds taking on expanded roles.
- The activities of Registered Nurses in expanded roles (RNXs) include education, clinical practice and clinical leadership in NHs. Their overall role resembles that of Clinical Nurse Specialists.
- The scope of RNXs' practice varies depending on their educational background, the physician model and the position of their direct supervisor.

What Are the Implications of This New Knowledge for Nursing Care for and With Older Adults?

- RNXs are a possible approach to address the lack of care for older people's expertise in NHs to guide lower qualified staff.
- Considering the difficulty of recruiting RNs, the professional development of staff already working in NHs to take up expanded roles seems key to maintain the quality of care.
- Given the diverse backgrounds of RNXs, their successful implementation will require NH management to invest in clarifying their roles and providing them with continuous education.

How Could the Findings Be Used to Influence Practice, Education, Research, and Policy?

- The description of RNXs' characteristics and activities informs health policy and practice regarding their use and provides a basis for the further advancement of new care models.
- The development of formal descriptions and financial compensation for RNX roles could help to ensure that NH residents receive high-quality care. While our study did not directly evaluate financial compensations or the contributions of RNXs towards quality of care, our findings lay a foundation for future research to address these potentially facilitating factors and outcomes.
- The further development of a regulatory context that allows nursing specialists, for example, Advanced Practice Nurses, to work to their full potential as independent practitioners has the potential to increase the effectiveness of care delivery in NHs.

1 | Introduction

As the number of nursing home (NH) residents with multiple and extended healthcare needs grows, there is an increased demand for nursing expertise (Dai et al. 2020). In response, governments and international health organisations actively develop and implement new care models featuring clinical care specialists as key components. These models significantly enhance the care provided to NH residents who have chronic conditions, are multimorbid, or are in end-of-life situations (World Health Organization 2015).

Acknowledging new care models as effective solutions to address well-known challenges such as qualified healthcare staff shortages and the ongoing need to improve care quality and efficiency (World Health Organization 2007), numerous countries have introduced models that utilise nurses with diverse educational backgrounds in expanded roles. These include Registered Nurses (RNs) with diploma education (short-cycle tertiary education, RNs), bachelor-educated RNs and Advanced Practice Nurses (APNs) with master's degrees (Chavez, Dwyer, and Ramelet 2018; Maier, Aiken, and Busse 2017). They are collectively referred to as Nurses in expanded roles (RNXs) (Basinska et al. 2021). As limited information exists about the characteristics of RNXs and their nursing activities, this study aimed to offer an overview of the characteristics and activities of RNXs employed in Swiss NHs and to examine factors associated with variations in the nursing activities they perform.

1.1 | Background

As an increasing number of older persons choose to age in place and enter NHs at later stages, they often exhibit higher degrees of frailty and multiple health conditions that may contribute to sudden declines or complications. The increasing demand for high-quality professional care in NHs calls for new care models that address the limited availability both of general practitioners and of nurses with advanced clinical skills (World Health Organization 2015).

Research demonstrates APNs' significant contributions to NH care. APNs, who possess at least a master's-level education and whose characteristics are shaped by their practice context (Hamric et al. 2014), provide comprehensive care, support residents in maintaining their health and utilise resources effectively (Chavez, Dwyer, and Ramelet 2018; Popejoy et al. 2017). They have been recognised for achieving equal or better outcomes compared to physician-only care (Chavez, Dwyer, and Ramelet 2018). Their services are prompt, reduce overtreatment, enhance treatment adherence, decrease hospital (re-)admissions, contribute to infection control during outbreaks and result in higher resident satisfaction (Maier, Aiken, and Busse 2017; Popejoy et al. 2017; World Health Organization 2007).

Although APNs are widely used internationally, few countries have reported their experiences with APNs (World Health Organization 2020); and those that have are predominantly from English-speaking countries (Popejoy et al. 2017). Furthermore, many countries either do not have any APNs or have insufficient numbers to meet NHs needs.

In Switzerland, for example, nurses have had access to master's-level education in Advanced Nursing Practice since 2001. Since the inception of academic nursing education programmes in Switzerland, 828 students have earned Master of Science in Nursing (MSN) degrees from Swiss universities (Swiss Association for Nursing Science 2021). However, few MSN-prepared nurses work in NHs: in 2022, only about 8.4% worked in NHs postgraduation (Schweizer Berufsverband der Pflegefachfrauen und Pflegefachmänner [SBK] et al. 2022).

To address the growing demand for nursing expertise, Swiss NHs employ RNXs with diverse educational backgrounds (Basinska et al. 2021). RNXs in NHs require skills that range from advanced assessment and care plan development to care coordination, coaching, prevention, education and advocacy for residents, families and staff (Chavez, Dwyer, and Ramelet 2018). To fulfil these expanded roles, many RNXs in Switzerland have acquired skills through educational programmes, such as the RNs' short-cycle tertiary education, bachelor's degrees in nursing (BSN) or master's degrees in nursing (MSN) (Basinska et al. 2021). A short-cycle tertiary education serves as an intermediary level, designed to bridge the gap between secondary education and BSN programmes. It aims to equip individuals with the essential practical, technical or occupational skills and knowledge required for specific job roles within the healthcare sector, including certain nursing roles. Short-cycle tertiary education programmes are typically shorter in duration compared to BSN programmes. They provide a focused curriculum that hones in on the practical application of skills, preparing individuals for immediate entry into the workforce (OECD 2018). In the context of nursing, these programmes provide foundational nursing education and training, enabling graduates to take on roles as RNs in a variety of healthcare settings, including NHs. The three Swiss educational programmes described align with International Classification of Education (ISCED) levels 5 (i.e., RN) to 7 (i.e., MSN) (OECD 2018). Additionally, after completing their initial degree programmes, some RNXs have completed Master of Advanced Studies (MAS) programmes (e.g., focusing on dementia, care for older persons or palliative care), which typically last at least 1 year. Many RNXs also complete educational programmes outside of ISCED standards, such as Certificates of Advanced Studies (CAS) or Diplomas of Advanced Studies (DAS), which last from 0.2 or 0.4 years (UNESCO Institute for Statistics 2021). Other nurses transition into these roles through ongoing professional development or work experience in response to individual NH needs. Although RNXs are increasingly implemented in Swiss NHs, data are limited regarding their characteristics or activities (Basinska et al. 2021; Favez et al. 2023).

To describe the variation in activities, roles and responsibilities of RNXs in this study, we used components of Hamric et al.'s (2014) integrative APN model as a theoretical framework to group their activities (Table 1). While Hamric's model was originally constructed for use with APNs, it focuses on the activities needed for any nurses to take up extended roles, for example, in coaching and guidance. As a result, it allows researchers to depict RNXs' key activities.

Acknowledging older persons' evolving healthcare needs, the growing demand for healthcare providers, and the limited understanding of RNXs, we sought to explore the characteristics and activities of RNXs in Swiss NHs. A questionnaire survey allowed us to reach a broad sample of eligible nurses and develop an initial overview. The supervisory structure in NHs may impact the work environment, autonomy and scope of practice of RNXs, thereby affecting the quality of care delivered to residents. The quality of the supervisor–nurse relationship also significantly influences job satisfaction among nurses (López-Ibort et al. 2021). Additionally, the role of senior nursing staff is recognised as pivotal in providing high-quality healthcare, emphasising the importance of effective clinical leadership and management for resident care in NHs (Rankin et al. 2016). The presence or absence of on-site physicians can alter the collaborative dynamics within the NHs,

TABLE 1 | Areas of activities in the integrative advanced practice nursing model (Hamric et al. 2014) to describe activities of nurses in expanded roles.

Areas of activity	Description
Direct clinical practice	The necessary foundation for coordinated care with identified care outcomes based on practice standards and informed decisions about preventive, diagnostic and therapeutic interventions
Guiding and coaching	Interaction of advanced practice nurses' interpersonal and clinical experiences, technical competencies and self-reflection influenced by individual and contextual factors
Consultation	Providing residents with essential resources to address their needs and utilising advanced practice nursing expertise to enhance colleagues' nursing practice
Evidence-based practice	The ability to make evidence-based decisions while implementing them in a clinical environment. It contains (i) the interpretation and use of evidence-based practice in the individual decision-making process, (ii) the interpretation and use of derived knowledge for residents' care and (iii) the evaluation of the clinical practice using evidence-based practice
Leadership	Leadership includes three distinct characteristics: mentoring (e.g., supporting and encouraging others in their development), innovation (e.g., acting as change agents at the individual or system level) and activism (e.g., assessment of clinical microsystems and understanding influential factors, i.e., macrosystems, determining the need for redesign; fostering safety, quality and reliability; and evaluating the results)
Collaboration	Teamwork or partnership that positively impacts professionals and residents. It is dynamic and often performed simultaneously with other competencies, shifting when the situation changes
Ethical decision-making skills	Identifying problems and developing strategies to improve the ethical climate surrounding the resident

influencing RNXs' engagement in advanced practice activities, and their ability to respond promptly to acute healthcare issues. RNXs with relevant competencies are shown to improve care in NHs, suggesting that their educational background could play a vital role in determining the scope and effectiveness of their practice (Basinska et al. 2021). By describing RNXs' characteristics and activities, we can inform health policy about how to implement their roles, establish a foundation for future advancements in care models and address current knowledge gaps.

2 | The Study

2.1 | Aims

With this study, we aimed to examine the characteristics and activities of RNXs in Swiss NHs. Specifically, our objectives were to determine the frequencies at which RNXs perform various activities and to explore how these activities vary based on RNXs' educational backgrounds, their direct supervisors and the presence of physicians in their NHs.

2.2 | Design

We conducted a secondary data analysis utilising data from the Swiss Nursing Homes Human Resources Project (SHURP 2018) (Zúñiga et al. 2019), a multicentre, cross-sectional Swiss NH study. The overarching goal of the SHURP 2018 study was to improve our comprehension of the relationship between various organisational and staff factors and the quality of care in Swiss NHs. The study included collection of data about RNXs' characteristics and activities for a national report available from the study website (Zúñiga et al. 2021).

2.3 | Participants

This study used secondary data from a convenience sample of 118 NHs in Switzerland. Switzerland has around 1543 NHs. Of these, 46% are private, accounting for 100,856 resident beds (Bundesamt für Statistik 2023). Swiss NHs have a mean of 65 beds. These are mostly divided among multiple wards with designated staff. Wards have a mean of 26 beds (Zúñiga et al. 2021). NHs need cantonal recognition to be able to bill their services to the insurance companies. They are responsible for 24 h/day, 7 day/week care and provide a broad range of services, including long-term care, dementia care, palliative care, older people psychiatric care, rehabilitation and might offer in addition day and night care (Zúñiga et al. 2021). Roughly 29% of staff have a short-cycle tertiary education (Swiss Health Observatory [Obsan] 2023).

For the SHURP 2018 study, all NHs that participated in the SHURP 2013 study (Schwendimann et al. 2013) were invited. They were included upon acceptance of the invitation. As previously reported by Ausserhofer et al. (2021), to increase our sample size, we also sent invitations to randomly selected NHs and allowed other interested NHs to contact the study team directly for participation. To enhance the participation rate further, we collaborated with various NH associations. NHs were enrolled in the study from December 2017 until March 2019. At the NH level, the inclusion criterion was recognition as an NH by cantonal authorities. The RNX sample size was determined by the participating NHs that employed such nurses and agreed to distribute the questionnaire to them.

This secondary data analysis focuses on RNXs working in NHs. The RNX sample consists of RNs with short-cycle tertiary or diploma education, and those with either a BSN or MSN degree. RNs are professionals who have completed a diploma-level education and have passed a national licensing examination to obtain RN status. In the context of Swiss NHs, RNs often perform a range of clinical tasks, including direct patient care and coordination of care with other healthcare professionals. BSN-prepared nurses in Switzerland completed an undergraduate programme that allows them to register as nurses. The programme typically covers a wide range of subjects, including anatomy, physiology, pharmacology, nursing theory and practice, research methods and healthcare ethics, and can serve as a stepping stone towards advanced nursing education. MSN-prepared nurses possess an in-depth understanding of nursing theory, research and advanced clinical skills. In Swiss NHs, they may take on clinical leadership roles in interprofessional teams, oversee care delivery and engage in evidence-based practice to enhance the quality of care provided to residents. Inclusion criteria for RNXs included working in this role for a minimum of 20% (i.e., 8 h/week) for at least 1 month, possessing expertise in NH care (e.g., acquired through further education), and, in collaboration with the Director of Nursing, being responsible for practice development, supporting interprofessional collaboration or providing coaching to staff members. Regular nursing staff were excluded from the sample.

2.4 | Data Collection

The SHURP 2018 research team provided facility- and RNX-level questionnaires to all participating NHs. Participants were given 12 weeks to complete and return their questionnaires. NHs had the option to participate between September 2018 and October 2019. The facility-level questionnaire, which assessed administrative data (e.g., size, legal form, staffing), was completed by the Director of Nursing or the NH Administrator. NHs distributed RNX questionnaires to their RNX staff. Each RNX questionnaire included an ID code that allowed the research team to match it to the facility, but not the individual who filled it out. The research team sent three reminders via email at approximately 3-week intervals. Every questionnaire included a pre-stamped return envelope, enabling each participant to send the questionnaire directly back to the research team.

2.5 | Measures

2.5.1 | Organisational Characteristics

We measured organisational characteristics including the NH's ownership status (i.e., public or private), its bed capacity, the number of RNXs employed and the presence of on-site physicians (yes/no). Additionally, we asked about the NH managers' perceptions concerning the difficulty of hiring RNs or nurses

with higher education (BSN, MSN). The presence of on-site physicians was used as an independent variable.

2.5.2 | Demographic Characteristics of RNXs

For our analyses, we asked RNXs for data on 11 demographic and job-specific variables: educational background (RN, BSN and MSN), gender (i.e., female and male), age (i.e., ≤30, 31–40, 41–50 and >51 years), further education (yes/no), RN and RNX work experience, RNX work experience in NHs and the current NH, their role in the NH (i.e., clinical, leadership, educational and research/innovator), direct supervisor's position (i.e., NH administrator, director of nursing, physician or ward manager; the latter was defined as the person overseeing and managing a specific ward or unit with designated staff within the NH), employment percentage (i.e., % of working hours in relation to full-time job), usual shift (i.e., day/other) and the number of residents they were responsible for (i.e., their area of responsibility). RNXs' educational background and direct supervisor's position served as independent variables.

2.5.3 | RNXs' Activities and Clinical Focus

2.5.3.1 | RNXs' Activities. We developed the survey questionnaire to measure RNXs' activities based on data from the INTERCARE study (Basinska et al. 2021), the EverCare Nurse Practitioner Role and Activity Scale (ENPRAS) (Abdallah et al. 2005) and a literature review (Canadian Nurse Practitioner Initiative 2006; Donald and Martin-Misener 2011). In collaboration with nurse experts working in NHs, the items were selected using an iterative process according to their relevance to the Swiss NH setting.

Based on Hamric's APN model, we assessed seven areas of activity (e.g., direct clinical practice, guiding and coaching). The full list of 37 variables, divided into seven areas, including RNX-reported data on how often they performed the activities on a 7-point frequency scale (0 = never, 1 = 1× every 3 months, 2 = 1× a month, 3 = 1× a week, 4 = 3–4× a week, 5 = 1× a day, 6 = more than 1× a day) can be consulted in Appendix S1.

To reduce the number of dependent variables in the analyses, we built composite scores to bundle variables per area of activity. To prepare for this step, we first generated one or several scales per area, as described below. We applied theoretical considerations and factor scores of orthogonally rotated principal component analysis (PCA) to combine variables into scales (Abdi and Williams 2010). For our purposes, Cronbach's $\alpha \geq 0.70$ indicated acceptable internal consistency (Schober, Mascha, and Vetter 2021). As dependent variables, if factor scores and Cronbach's alphas were acceptable, we followed the PCA guidance and used the composite score over several items, calculating the mean score over all included items. If the Cronbach's alpha was unacceptable, that is, no score could be built, we used single items (see Appendix S1 for further information).

2.5.3.1.1 | *Direct Clinical Practice.* We measured direct clinical practice using 10 items. Two individual items assessed *Direct clinical care as an RNX*, for example, focusing on advanced, specialised nursing services provided, such as care coordination, education, advocacy or research, and *Direct clinical care below one's scope of practice*, for example, situations where RNXs, regardless of their training and education, provide care that is below their competency level or outside their defined scope of practice, for example, providing basic care services that do not utilise their advanced training and expertise, essentially functioning at the level of a RN with diploma education or even a lower level healthcare provider. Based on the PCA, the *Perform assessments* scale included five items. These involve the RNXs conducting physical, functional, psychological and social assessments, and monitoring chronic diseases while taking the necessary measures when required ($\alpha = 0.83$, factor loadings ranging from 0.302 to 0.378). The *Prescribing of nursing interventions* scale consisted of three items: one concerning RNXs prescribing nursing interventions; one on prescribing interventions in deteriorating health states or acute situations; and one on prescribing interventions in challenging situations ($\alpha = 0.86$, factor loadings ranging from 0.341 to 0.446, see Appendix S2).

2.5.3.1.2 | *Guiding and Coaching.* Based on theoretical considerations, we assessed guiding and coaching using nine items. The *Guiding and coaching residents* scale, which is comprised of three items related to RNXs (a) providing information about residents' current health status; (b) offering information about treatment; and (c) engaging in complex discussions with residents and relatives ($\alpha = 0.92$, factor loadings ranging from 0.393 to 0.411). The *Guiding and coaching nurses* scale included five items on how RNXs (a) evaluate residents' situations; (b) coach and mentor the nursing staff to implement clinical skills; (c) create and evaluate care plans; (d) promote interprofessional collaboration; and (e) conduct discussions with residents and relatives ($\alpha = 0.88$, factor loadings ranging from 0.308 to 0.386, see Appendix S3). We used *Exchanging information with other RNXs* as an individual item.

2.5.3.1.3 | *Consultation.* We measured *Initialising consultations* using a single item.

2.5.3.2 | Evidence-Based Practice. We assessed evidence-based practice (EBP) using two items. The *Applying research findings* scale evaluated RNXs' application of research results to resident care and employee education and support ($\alpha = 0.85$, both factor loadings were 0.707, see Appendix S4).

2.5.3.2.1 | *Clinical Leadership.* We measured clinical leadership using six items. The *Contributing to care while in hospital* scale consisted of two items related to RNXs' commitment to ensuring the availability of all relevant documents during residents' hospitalisation and to contacting the hospital regarding resident transfers ($\alpha = 0.84$, both factor loadings were 0.707, see Appendix S5). Further activities for clinical leadership included *Supervising the residents' charts*, for example, ensuring that the medical history, diagnoses, treatment plans and other relevant information is accurately and comprehensively recorded in their charts, *Analysing adverse events*, *Conducting meetings at the round table* and *Monitoring drug plans*. These were used as single items, as no scale could be formed for them.

2.5.3.2.2 | ***Collaboration.*** Considering theoretical aspects, we utilised the three items measuring collaboration as single items: *Contacting the physician when the condition of a resident changes*, *Conducting visits with a physician* and *Reviewing polypharmacy*.

2.5.3.2.3 | ***Ethical Decision-Making Skills.*** We measured ethical decision-making skills using seven items. The *Ethics in end-of-life care* scale consisted of five items related to RNXs enhancing the residents' and their relatives' understanding about the resident's condition; creating an emergency plan with residents and/or their relatives; supporting communication, dealing with end-of-life issues between the residents and their physicians; supporting treatment at the end of life according to residents' wishes, and consulting with relatives in preparation for the transition to the end phase of the resident's disease ($\alpha = 0.92$, factor loadings between 0.423 and 0.471, see Appendix S6). We were unable to assign two items—*verifying the validity of current advance directives with residents and*, *if necessary*, *make adjustments* and *Identifying and addressing ethical conflicts*—to the factor. Therefore, we used them as single items.

2.5.3.3 | **RNXs' Clinical Focus.** We measured RNXs clinical focus utilising nine binary (yes/no) items. The *dementia care* scale consisted of three items: *dementia care*, *care for family members* and *resident safety* ($\alpha = 0.72$, factor loadings between 0.532 and 0.612, see Appendix S7). Theoretical considerations led to the decision to use *palliative care* and *older people psychiatric care* as individual items. We were unable to assign four items—*wound care*, *hygiene*, *care for older people* and *transitional care/rehabilitation*—to the factor. Therefore, we used them as single items.

2.6 | Ethics Statement

The Swiss ethics committee did not require authorisation for SHURP 2018 (BASEC Nr.: Req-2018-00420). We assured respondents that the research team would treat their questionnaires with full confidentiality, although we could not guarantee anonymity since several NHs had only one RNX, and their names often appeared on NH websites. Participants indicated their consent to participate in the study by completing and returning the questionnaire.

2.7 | Data Analysis

We performed all statistical analyses using *R*, *version* 4.0.2 (R Core Team 2020), with the *tableone* (Yoshida and Bartel 2020), *psych* (Revelle 2020) and *rstatix* (Kassambara 2021) packages. First, we calculated the frequencies (n), percentages (%), means, standard deviations (SDs), medians and interquartile ranges (IQRs) to describe the characteristics of RNXs and the frequency of each activity they performed. Second, we performed Kruskal–Wallis tests to assess differences in RNXs' activities by educational background, direct supervisor and the presence of a physician in the NH. We then estimated the effect size by measuring eta-squared (η^2) to evaluate the strength and importance (meaningfulness) of that relationship's intervariable relationships (Tomczak and Tomczak 2014). The η^2 (from 0 to 1) estimated the percentage of the dependent variable's variance explained by the independent variable. The interpretation values are 0.01 to <0.06 (small effect), 0.06 to <0.14 (moderate effect) and ≥0.14 (large effect) (Kassambara 2021). Finally, we performed Dunn's test to examine pairwise differences between groups, controlling for type I errors using Benjamini and Hochberg's (1995) approach. We used a significance level of $p \leq 0.05$ for all statistical tests.

2.8 | Missing Data

There were no missing data except for activities related to *EBP* and *Ethical decision-making skills* (missing data: 1%). To conduct PCA, we used complete case data sets using the pairwise deletion method.

2.9 | Validity and Reliability

We developed the survey on RNX activities as described above. We translated items from English to German using forward and backward translation (Maneesriwongul and Dixon 2004), and piloted the items with RNXs working in the field to enhance relevance and clarity. As described in the previous section, the scales had a good factor structure and reliability.

3 | Results

3.1 | Organisational Characteristics

We included a sample of 118 NHs in our study, of which 33.9% were private and 66.1% were public. These NHs' capacity ranged from 20 to 316 beds. Around 50.4% of NHs worked with contracted on-site physicians; and 94.1% reported challenges in recruiting RNs or nurses with a BSN or MSN. We found that 72.2% ($n = 83$) of the NHs in our sample employed RNXs, of which 66 forwarded our survey questionnaires to their RNXs. In the subgroup of NHs with a 100% RNX return rate ($n = 51$), we were able to examine the team mix among RNXs per NH: 35.3% of the NHs worked exclusively with RNs in RNX roles, 29.4% with bachelor-prepared nurses only, 19.6% with master-prepared nurses only and the remaining 15.7% with mixed teams—mostly combining RNs and bachelor-prepared nurses.

3.2 | RNX Characteristics

We collected 104 valid questionnaires from RNXs (an 89.7% response rate) across 62 NHs. Among these RNXs, the majority (48%) had a diploma education (RN), were female (90%), and were aged over 51 years (44%). A smaller percentage of RNXs (17%) had MSN qualifications. Additional descriptive statistics on RNXs can be found in Table 2.

3.3 | RNXs' Clinical Focus and Activities

The RNXs' most prevalent clinical foci were *dementia care* (55.8%), *palliative care* (44.2%) and *older people care* (41.3%). Further details are provided in Table 3.

TABLE 2 | RNXs' characteristics stratified by education level ($n = 104$).

RNXs' characteristics	Overall *n* (%)	Education			Missing (%)
		RN *n* (%)	BSN *n* (%)	MSN *n* (%)	
n	104 (100.0)	48 (48.0)	35 (35.0)	17 (17.0)	3.8
Age					
≤30 years	14 (13.6)	1 (2.1)	11 (32.4)	2 (11.8)	1.0
31–40 years	25 (24.3)	11 (22.9)	8 (23.5)	6 (35.3)	
41–50 years	19 (18.4)	11 (22.9)	4 (11.8)	3 (17.6)	
>51 years	45 (43.7)	25 (52.1)	11 (32.4)	6 (35.3)	
Gender					
Female	92 (90.2)	41 (87.2)	31 (91.2)	16 (94.1)	1.9
Further education					
Yes	59 (72.0)	26 (61.9)	22 (75.9)	11 (100.0)	21.2
Work experience as RN in NHs					
≤5 years	50 (49.0)	12 (26.1)	23 (65.7)	13 (76.5)	1.9
6–10 years	31 (30.4)	19 (41.3)	8 (22.9)	3 (17.6)	
11–15 years	11 (10.8)	8 (17.4)	3 (8.6)	0 (0.0)	
16–20 years	6 (5.9)	5 (10.9)	1 (2.9)	0 (0.0)	
>20 years	4 (3.9)	2 (4.3)	0 (0.0)	1 (5.9)	
Work experience as RNX					
≤5 years	58 (55.8)	28 (58.3)	19 (54.3)	10 (58.8)	0.0
6–10 years	28 (26.9)	13 (27.1)	10 (28.6)	2 (11.8)	
11–15 years	12 (11.5)	6 (12.5)	3 (8.6)	3 (17.6)	
16–20 years	3 (2.9)	1 (2.1)	1 (2.9)	1 (5.9)	
>20 years	3 (2.9)	0 (0.0)	2 (5.7)	1 (5.9)	
Work experience as RNX in NHs					
≤5 years	64 (61.5)	31 (64.6)	19 (54.3)	14 (82.4)	0.0
6–10 years	28 (26.9)	10 (20.8)	13 (37.1)	1 (5.9)	
11–15 years	8 (7.7)	6 (12.5)	1 (2.9)	1 (5.9)	
16–20 years	2 (1.9)	0 (0.0)	1 (2.9)	1 (5.9)	
>20 years	2 (1.9)	1 (2.1)	1 (2.9)	0 (0.0)	
Work experience as RNX in current NH					
≤5 years	72 (69.9)	33 (68.8)	24 (70.6)	15 (88.2)	1.0
6–10 years	23 (22.3)	10 (20.8)	8 (23.5)	2 (11.8)	
11–15 years	5 (4.9)	5 (10.4)	0 (0.0)	0 (0.0)	
16–20 years	3 (2.9)	0 (0.0)	2 (5.9)	0 (0.0)	
>20 years	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Role—clinical					
Often/Very often	73 (70.9)	37 (78.7)	22 (62.9)	11 (64.7)	1.0

(Continues)

TABLE 2 | (Continued)

RNXs' characteristics	Overall *n* (%)	Education			Missing (%)
		RN *n* (%)	BSN *n* (%)	MSN *n* (%)	
Role—leadership					
Often/Very often	68 (65.4)	36 (75.0)	20 (57.1)	8 (47.1)	0.0
Role—educational					
Often/Very often	76 (73.1)	35 (72.9)	28 (80.0)	13 (76.5)	0.0
Role—research/innovator					
Often/Very often	39 (38.2)	13 (28.3)	17 (48.6)	6 (35.3)	1.9
Consulting nursing staff					
Often/Very often	72 (69.9)	35 (72.9)	22 (64.7)	12 (70.6)	1.0
Direct supervisor's position					
NH administrator	30 (30.6)	14 (31.1)	12 (35.3)	3 (18.8)	5.8
Director of nursing	57 (58.2)	24 (53.3)	19 (55.9)	13 (81.2)	
Physician	3 (3.1)	3 (6.7)	0 (0.0)	0 (0.0)	
Ward manager	8 (8.2)	4 (8.9)	3 (8.8)	0 (0.0)	
Employment percentage					
≤50%	10 (9.6)	5 (10.4)	2 (5.7)	2 (11.8)	1.0
51–90%	61 (58.7)	24 (50.0)	22 (62.9)	12 (70.6)	
>90%	33 (31.7)	19 (39.6)	11 (31.4)	3 (17.6)	
Number of day shifts per month	12.6 (7.4)	13.6 (6.9)	12.8 (7.9)	10.4 (7.3)	9.6
Number of other shifts per month	1.2 (3.1)	1.1 (1.4)	1.7 (5.1)	0.4 (0.6)	1.9
Number of residents responsible for, median [IQR]	68 [35, 130]	60 [30, 108]	74 [37, 126]	134 [58, 159]	20.2

Abbreviations: BSN, bachelor of science in nursing; IQR, interquartile range; MSN, master of science in nursing; *n*, sample count; NH, nursing home; RN, registered nurse with diploma education (short-cycle tertiary education); RNXs, nurses in expanded roles.

TABLE 3 | RNXs' clinical focus stratified by education level ($n = 104$).

RNXs' clinical focus	Overall *n* (%)	Education			Missing (%)
		RN *n* (%)	BSN *n* (%)	MSN *n* (%)	
n	104 (100.0)	48 (48.0)	35 (35.0)	17 (17.0)	3.8
Dementia care	58 (55.8)	23 (47.9)	21 (60.0)	12 (70.6)	0.0
Palliative care	46 (44.2)	15 (31.2)	19 (54.3)	10 (58.8)	0.0
Older people care	43 (41.3)	22 (45.8)	11 (31.4)	8 (47.1)	0.0
Hygiene	32 (30.8)	12 (25.0)	12 (34.3)	8 (47.1)	0.0
Older people psychiatric care	27 (26.0)	11 (22.9)	9 (25.7)	6 (35.3)	0.0
Wound care	26 (25.0)	10 (20.8)	12 (34.3)	3 (17.6)	0.0
Transitional care/rehabilitation	17 (16.3)	10 (20.8)	3 (8.6)	3 (17.6)	0.0

Abbreviations: BSN, bachelor of science in nursing; MSN, master of science in nursing; *n*, sample count; RN, Registered Nurse with diploma education (short-cycle tertiary education); RNXs, nurses in expanded roles.

As illustrated in Table 4, RNXs performed activities at varying frequencies. On average, they carried out activities on a monthly or weekly basis (with mean values ranging from 1.02 to 3.04). The group of master-prepared nurses' most frequent activity was providing direct clinical care several times per week (mean 3.29 [SD 1.69]), while the RN group mainly supervised residents' charts several times per week (mean 3.46 [SD 1.53]).

3.4 | Variation in Practice Patterns

All results from the performed Kruskal–Wallis tests and post hoc analyses are presented in Appendices S8–S10.

3.4.1 | Educational Background

When looking at RNXs' educational backgrounds, there was a moderate effect ($\eta^2 = 0.064$) regarding a difference in the frequency of guiding and coaching of NH residents ($\chi^2 = 8.41$, $p = 0.032$). Post hoc analyses showed that RNs were more likely than nurses with bachelor's-level training to guide and coach residents ($z = 2.86$, $p = 0.004$). There was a moderate effect ($\eta^2 = 0.100$) regarding differences in the frequency of applying research findings ($\chi^2 = 12.1$, $p = 0.002$): RNXs with master's-level training were more likely to apply research findings than RNs ($z = 3.47$, $p < 0.001$) or those with bachelor's-level training ($z = 2.55$, $p < 0.001$).

3.4.2 | Direct Supervisor

When looking at RNXs' direct supervisors, there was a large effect ($\eta^2 = 0.164$) regarding the frequency of RNXs delivering direct clinical care below their scope of practice ($\chi^2 = 19.4$, $p < 0.001$). Post hoc analyses revealed that RNXs supervised by the NH administrator were less likely to provide direct nursing care below their scope of practice than those supervised by physicians ($z = 2.16$, $p = 0.030$) or ward managers ($z = 4.10$, $p < 0.001$). RNXs supervised by the director of nursing were less likely to provide direct clinical care below their scope of practice than those supervised by ward managers ($z = 3.27$, $p = 0.001$).

There was a small effect ($\eta^2 = 0.051$) regarding the frequency of applying research findings ($\chi^2 = 8.09$, $p = 0.044$). Post hoc analyses showed that RNXs supervised by the NH administrator were less likely to apply research findings than those supervised by the director of nursing ($z = 2.09$, $p = 0.037$).

There was a moderate effect ($\eta^2 = 0.099$) regarding the frequency of contacting the physician when the condition of a resident changes ($\chi^2 = 12.9$, $p = 0.005$). Post hoc analyses showed that RNXs supervised by the NH administrator or the director of nursing were less likely to contact the physician when the condition of a resident changed than those supervised by the ward manager (NH administrator: $z = 3.52$, $p < 0.001$; director of nursing: $z = 2.93$, $p = 0.003$).

There was a moderate effect ($\eta^2 = 0.084$) regarding the frequency that RNXs conducted visits with physicians ($\chi^2 = 11.4$, $p = 0.010$). Post hoc analyses showed that RNXs supervised by the NH administrator or director of nursing were less likely to conduct visits with physicians than RNXs supervised by the ward manager (NH administrator: $z = 2.92$, $p = 0.004$, director of nursing: $z = 2.20$, $p = 0.028$) and RNXs supervised by NH administrators were less likely to do so than RNXs supervised by physicians ($z = 2.09$, $p = 0.037$).

3.4.3 | On-Site Physicians

When looking at on-site physicians in the NHs, their presence had a moderate effect ($\eta^2 = 0.073$) regarding the frequency of RNXs exchanging information with other RNXs ($\chi^2 = 8.42$, $p = 0.004$). Post hoc analyses showed that RNXs in NHs with on-site physicians were more likely to exchange information with other RNXs than those in NHs without on-site physicians ($z = 2.90$, $p = 0.005$).

In the NHs with on-site physicians, there was a moderate effect ($\eta^2 = 0.065$) regarding the frequency of RNXs contacting the physician when a resident's condition changed ($\chi^2 = 7.62$, $p = 0.006$). Post hoc analyses showed that RNXs in NHs with on-site physicians were more likely to contact the physician when the condition of a resident changed than those in NHs without on-site physicians ($z = 2.76$, $p = 0.006$).

In the NHs with on-site physicians, there was a small effect ($\eta^2 = 0.032$) regarding the frequency of RNXs conducting visits with physicians ($\chi^2 = 4.28$, $p = 0.039$). Post hoc analyses showed that RNXs in NHs with on-site physicians were moderately more likely to conduct visits with physicians than those in NHs without on-site physicians ($z = 2.07$, $p = 0.039$).

4 | Discussion

This study aimed to explore the characteristics and activities of RNXs in Swiss NHs. RNs with diploma education constituted the most prevalent educational group, while master-prepared nurses were least prevalent. Bachelor-prepared nurses reported taking on educational roles most frequently, whereas master-prepared nurses predominantly provided direct clinical practice in their roles as RNXs. In contrast, RNs with diploma education engaged most frequently in direct clinical tasks below their scope of practice, such as relieving the nursing team or as a part of the regular roster. RNXs' educational background, their direct supervisor and the presence of on-site physicians in their NHs were all associated with differences in the frequencies they performed their activities (e.g., *Guiding and Coaching of NH residents*, *Applying research findings* and *Direct clinical care below their scope of practice*).

In total, 19.6% of the participating NHs employed master-prepared nurses. As indicated by the Swiss Association for Nursing Science (2021) and the World Health Organization (2020), this is a lower presence than in other countries. The United States, for example, has a higher prevalence of APNs (Popejoy et al. 2017). However, few master-prepared nurses choose to work in NHs (Dai et al. 2020; Schweizer Berufsverband der Pflegefachfrauen und Pflegefachmänner [SBK] et al. 2022).

TABLE 4 | Mean frequency of RNXs' activities stratified by education level ($n = 104$).

RNXs' activities	Overall Mean (SD)	Education			Missing (%)
		RN Mean (SD)	BSN Mean (SD)	MSN Mean (SD)	
n	104 (100.0)	48 (48.0)	35 (35.0)	17 (17.0)	3.8
Direct clinical practice					
Direct clinical care as RNX	2.81 (1.70)	2.83 (1.59)	2.51 (1.88)	3.29 (1.69)	0.0
Direct clinical care without additional function	2.25 (2.05)	2.52 (2.15)	2.03 (1.96)	1.71 (1.76)	0.0
Performing assessments	1.55 (1.19)	1.60 (1.03)	1.31 (1.24)	1.94 (1.46)	0.0
Prescribing of nursing interventions	2.53 (1.39)	2.64 (1.45)	2.42 (1.38)	2.52 (1.31)	0.0
Guiding and coaching					
Guiding and coaching of residents	2.44 (1.44)	2.78 (1.35)	1.85 (1.42)	2.59 (1.54)	0.0
Guiding and coaching nurses	2.85 (1.22)	2.92 (1.03)	2.69 (1.35)	2.96 (1.48)	0.0
Exchange information with other RNXs	2.61 (1.72)	2.46 (1.61)	2.71 (1.74)	2.82 (1.94)	0.0
Consultation					
Initialising consultations with specialists	1.60 (1.30)	1.77 (1.43)	1.37 (1.11)	1.71 (1.21)	0.0
Evidence-based practice					
Applying research findings	1.94 (1.36)	1.73 (1.42)	1.89 (1.23)	2.79 (1.17)	1.0
Clinical leadership					
Contributing to care while in hospital	1.24 (1.15)	1.46 (1.38)	1.06 (0.86)	1.00 (1.03)	0.0
Supervising residents' charts	3.04 (1.58)	3.46 (1.53)	2.60 (1.67)	3.18 (1.13)	0.0
Analysing adverse events	2.37 (1.55)	2.27 (1.55)	2.57 (1.54)	2.53 (1.59)	0.0
Monitoring drug plans	2.41 (1.64)	2.71 (1.82)	1.97 (1.32)	2.82 (1.55)	0.0
Conducting round table meetings	1.39 (1.11)	1.46 (1.07)	1.37 (1.17)	1.29 (1.21)	0.0
Collaboration					
Contacting the physicians	2.18 (1.76)	2.23 (1.78)	2.09 (1.80)	2.18 (1.63)	0.0
Visits with physicians	1.55 (1.36)	1.81 (1.48)	1.20 (1.18)	1.53 (1.28)	0.0
Reviewing polypharmacy	1.15 (1.14)	1.40 (1.20)	0.91 (1.04)	1.12 (1.17)	0.0
Ethical decision-making skills					
Ethics in end-of-life care	1.37 (1.04)	1.46 (1.14)	1.23 (0.94)	1.34 (1.02)	1.0
Reviewing and verification of the resident's advance directive status	1.02 (1.03)	1.13 (1.21)	0.91 (0.92)	0.94 (0.75)	1.0
Identifying and addressing ethical issues	1.67 (1.07)	1.62 (1.09)	1.57 (1.04)	2.06 (1.03)	1.0

Abbreviations: BSN, bachelor of science in nursing; MSN, master of science in nursing; *n*, sample count; RN, Registered Nurse with diploma education (short-cycle tertiary education); RNX, nurses in expanded roles; SD, standard deviation; Variable range: 0, never; 1; 1× every 3 months; 2, 1× a month; 3, 1× a week; 4, 3–4× a week; 5, 1× a day; 6, more than 1× a day.

The limited interest among MSN students and professionals in NH employment poses a significant challenge to workforce planning. With an aging population, the need for skilled nursing care in NHs is likely to increase. Therefore, to ensure adequate care for future populations, it is crucial to address the shortage of master-prepared nurses in these settings. When Dai et al. (2020) investigated nursing students' intentions to work in NHs over the past decade, they discovered that, despite efforts by governments, educational systems and professional nursing associations to promote gerontological nursing services in recent years, few planned to pursue careers in NHs.

The same research group also identified important factors influencing MSN students' decisions to work in NHs. These included attitudes towards caring for older people and the preparedness for NHs' complex clinical practice environments. Gaining a deeper understanding of these factors would inform interventions aimed at increasing the number of master-prepared nurses in NHs. The present study allows a more accurate depiction of the content of master-prepared nurses' work in NHs, both helping to guide their education and increasing the attractiveness of NHs by demonstrating the diversity of activities involved when working in this setting. Addressing this challenge has the potential to enhance healthcare delivery in NHs and promote more comprehensive and specialised care for residents.

Nursing education plays a crucial role in preparing nurses for clinical practice in NHs. Our findings indicate that only a small proportion of RNXs employed in Swiss NHs had obtained a master's-level education, with 24.1% of bachelor-prepared nurses and 38.1% of RNs having no further education. While 61.9% of RNs had completed additional educational programmes, the remaining 38.1% appeared to have entered RNX roles through ongoing professional development, work experience and individual NH requirements.

These approaches may reflect a typical process of refinement and restructuring observed in countries with advancing generalised nursing education (Schober et al. 2020). Ensuring ongoing education for RNs is crucial to uphold the quality of the care they deliver. In this regard, as demonstrated by the meta-synthesis conducted by Mlambo, Silén, and McGrath (2021), spanning from 2010 to 2019, NHs' support of RNs is essential. Mlambo et al. explored nurses' experiences with professional development, highlighting differences between nurses' needs and expectations concerning continuous professional development and the approaches adopted by organisations. The lack of financial resources and time allocated by organisations for RNs to engage in continuous professional development activities hinders their prospects to update their knowledge and skills. This impedes the provision of care that meets the needs and expectations of NH residents (Mlambo, Silén, and McGrath 2021). Given the difficulty of recruiting skilled nurses, the professional development of staff currently working in long-term care is a key strategy to uphold the NH workforce. NHs that engage in long-term planning invest in continuing education to build, attract and retain their workforce. This investment is intricately tied both to the strategic visions of healthcare organisations and to the current visions of their managers.

RNXs most frequently reported a variety of roles, including educational (73.1%), clinical (70.9%), and leadership (65.4%). Several regularly performed tasks emerged, for example, supervising residents' charts, guiding and coaching nurses, administering direct clinical care, exchanging information with other RNXs, prescribing nursing interventions, guiding and coaching residents, monitoring drug plans and analysing adverse events. When consistently performed by RNXs, these activities underscore their importance in NHs and their impact on patient outcomes and organisational efficiency. Overall, our analyses indicated that RNXs, even those without master's-level educations, tended to prioritise organisational factors and engage in activities closely resembling those of Clinical Nurse Specialists (CNSs). There have been recent calls for the United States and Canada to increase the involvement of both Nurse Practitioners (NPs) and CNSs in NHs (Bakerjian 2022; McGilton, Bowers, and Resnick 2022). These calls reflect highly qualified nurses' ability to assume leadership roles, enhance clinical care and improve resident outcomes. Although in Switzerland RNX roles are still in development, our study shows RNXs' importance concerning not only the education of other care providers but also consultations both with direct care staff and the organisation as a whole on how to improve quality of care. Basinska et al. (2021) further suggested that models developing RNXs across a wide range of educational levels could be effective, as APNs and RNXs complement each other. For countries that do not yet have enough master-prepared nurses available to work in NHs, RNXs with RN or BSN educations might not just be a step along the road but might actually provide ongoing contributions to quality of care.

Our findings show that 75% of RNs hold leadership roles, compared to only 47.1% of master-prepared nurses. However, we cannot be certain how the respondents interpreted the concept of a leadership role. It is possible that RNs had both a role as charge nurse (i.e., overseeing the ward during the shift) as well as the role of a RNX; accordingly, having a leadership role might not only refer to clinical leadership but also to a management role. Leadership plays a critical role in NHs. Effective nursing leaders uphold high care standards, boosting staff morale and facilitating effective communication and problem-solving. Nevertheless, as highlighted by Cummings et al. (2021), nursing leadership practices lack clear characterisation; therefore, distinguishing between clinical leadership and the responsibilities of a charge nurse can be challenging. Better understanding and defining nursing leadership roles is likely to lead to more effective leadership practices within NHs.

Our findings indicate that, compared to RNs or bachelor-prepared nurses, master-prepared nurses are more likely to apply research findings, thereby highlighting one of their key competencies regarding resident care. However, Switzerland is in the early stages of implementing general and profession-specific requirements for the regulated practice of master's-level nurses (Maier, Aiken, and Busse 2017). Consequently, as described by Popejoy et al. (2017), due to a lack of regulation under Swiss law, master-prepared nurses in Switzerland do not practice autonomously and do not have full prescribing authority. This is why we did not ask about APN activities such as diagnosis or medication prescription, as described by Chavez, Dwyer, and Ramelet (2018). The existing regulatory environment in Switzerland does not fully leverage the potential of

master-prepared nurses, particularly in terms of independent practice and prescriptive authority, which could impact the efficiency and effectiveness of care delivery in NHs.

Additionally, we cannot judge the scope and depth of the activities reported by the RNXs in our study. For instance, if both RNs and master-prepared nurses report contacting physicians when a resident's condition changes, we lack information on whether or how the quality of their communication differs. For example, strong differences in detail or relevance would potentially affect physicians' ability to respond effectively. Moreover, as has been shown in acute care (Aiken et al. 2014), higher education is also associated with positive outcomes in NH resident care (Jutkowitz et al. 2023; Trinkoff et al. 2015). However, we focused on RNXs and their activities without exploring how educational background influences RNXs' contribution to NH residents' quality of care. Further research is needed to examine this relationship and identify any potential educational background-based differences.

Our results showed that RNXs' direct supervisors significantly influence the frequency of their engagement in direct clinical care below their scope of practice. RNXs were more likely to fulfil their RNX roles when supervised by higher level individuals, that is, the NH administrator or the Director of Nursing, as opposed to reporting to a ward manager. One possible explanation is that ward managers are responsible for the daily operations of a unit. Consequently, in situations where resources are limited, all available professional groups may be assigned tasks outside their target areas, potential leading to misallocation of roles. This, in turn, could result in under-utilisation of RNXs' skills, potentially impacting the quality of care provided.

Furthermore, the supervisory structure within NHs can directly influence the quality of care received by residents by influencing the extent to which specialised nursing skills are utilised. For example, our findings indicated that RNXs supervised by the NH administrator were less likely to apply research findings to practice compared to those supervised by the Director of Nursing. This suggests that supervisors can significantly impact the integration of evidence-based practice in NHs. The Director of Nursing's expertise in nursing may lead them to consider scientific findings more relevant to practical application. Both Kajermo et al. (2008) and Gardulf et al. (2005) emphasised the importance of educating and training direct supervisors in research and research utilisation to enhance their ability to support such activities. Gardulf et al. (2005) specifically highlighted how direct supervisors' support for development and research activities impacted nurses' job satisfaction and intention to leave their jobs. Although Gardulf et al.'s (2005) study focused on nurses' perceptions in hospital setting, it is reasonable to extend the underlying principles to nurses in NHs. That is, both to foster support for RNXs' activities and to promote nurse retention, it is vital to educate direct supervisors about research and its application in NH settings.

Finally, our analyses indicated that RNXs in NHs with on-site physicians were more likely to exchange information with other RNXs compared to those in NHs without on-site physicians. However, we found no evidence either confirming or contradicting this finding. One possible explanation is that the pursuit of resident safety relies on continuous learning, making it crucial to share experiences within networks. Thus, the interaction between on-site physicians and RNXs in NHs may foster a range of information exchanges and encourage RNXs to seek further collaboration with their counterparts. Another possible explanation is that RNXs have a stronger clinical focus in their work when physicians are present. The presence of on-site physicians might improve collaborative decision-making, resulting in more comprehensive and effective resident care. Additionally, sharing experiences within professional networks plays a critical role in enhancing patient safety, as it facilitates the dissemination of best practices and lessons learned. Promoting the presence of on-site physicians can be beneficial not only for the direct medical care they provide but also for the indirect advantages of improved communication and collaboration they foster among the nursing staff.

4.1 | Limitations

Due to several limitations, the findings of this secondary data analysis should be interpreted with caution. Foremost, the reliance on previously collected data restricts the scope of analysis to the variables and data quality of the original data set. The original data collection methods may not have been designed with the objectives of this secondary analysis in mind, potentially leading to a lack of critical data or nuanced insights that could be relevant for our research questions. However, despite possible limitations, our secondary analysis provides a valuable avenue for further exploration and understanding of new care models, leveraging existing data resources to generate new knowledge and contribute to the evidence base in NH care. Although convenience sampling is common in nursing research, it can produce biased results. Because the overall aim of our study focused on quality of care, we may have oversampled NHs working with RNXs, as those institutions were already aware of RNXs' importance concerning quality improvement. Therefore, future research should include random sampling of NHs to minimise sampling bias. In addition, we gave NH managers selection criteria to decide who to include in the survey. This could have led to non-response bias. To minimise self-report bias, activities performed by RNXs should be observed. In terms of study design, the multicentre cross-sectional design of SHURP 2018 does not allow causal inferences about the associations between variables. Given our small sample size, although effects may be highly significant, we cannot demonstrate statistical significance. In view of the small sample size, the results have limited generalisability. There was missing data concerning the variables *Further education* and *Number of residents responsible for*, each with over 20% data missing. This level of missing data can potentially impact the robustness and the interpretability of the findings related to these variables. Finally, the employment percentages of the RNXs included in our sample varied, which might lead to bias in the frequency measures. However, our answer options considered absolute frequencies (from never to several times a day), reducing this bias.

5 | Conclusion

This is the first study to explore characteristics and activities of RNXs employed in NHs based on Hamric's integrative APN model. RNXs frequently report a variety of roles, including educational, clinical and leadership roles. Our findings suggest that

there is a noticeable underrepresentation of master-educated nurses in Swiss NHs. The frequencies of RNXs' activities vary according to their educational background, their direct supervisor and the presence of on-site physicians; for example, the application of research findings in practice is more common among master-prepared nurses, while RNXs under the direct supervision of ward managers are more often assigned work below their scope of practice. RNXs play important roles in supporting quality of care. To increase the effectiveness of care delivery in NHs, their managers need to invest in the continuous professional development of their existing staff and the development of expanded nursing roles.

5.1 | Implications for Research

The findings reported here highlight the need for further research to better understand the impact of RNXs' educational backgrounds and supervisory structures on their roles, responsibilities and effectiveness in NHs. Also, more studies are needed to investigate the influence of on-site physicians on nursing team dynamics. In addition, our results could provide a foundation for future research to improve our understanding of new care models with RNXs, which are still to be elucidated.

5.2 | Implications for Education

Our findings underscore the importance of continuous education for RNs and bachelor-level trained nurses working in NHs. More specifically, they suggest a need for systematic, continuous professional development programmes that keep nursing professionals up-to-date with the latest research and help them maintain high-quality care. To support this objective, organisations should allocate sufficient funding and enable access to professional development programmes.

5.3 | Implications for Practice

Because the frequencies of RNXs' activities vary considerably, NHs' role expectations for RNXs should be clarified at the institutional level before these positions are implemented. The participatory, evidence-based, patient-focused process, for guiding the development, implementation and evaluation of advanced practice nursing (PEPPA) framework (Bryant-Lukosius and Dicenso 2004) may guide the implementation process of such new roles. These findings highlight the importance of supervisory structures in shaping nursing roles and the need for NHs to optimise the utilisation of nursing skills. Improved communication dynamics within NHs, possibly supported by the presence of on-site physicians, can also contribute to the effectiveness of nursing practice. By ensuring that nurses are able to practice at the top of their licence, NHs can better leverage the specialised skills and knowledge of RNXs to meet the complex health needs of their residents.

5.4 | Implications for Policy

As RNXs' titles are not protected, authorities, managers and researchers are challenged to accurately identify and delineate their roles. A formal structure regarding successful RNXs' educational backgrounds, roles and responsibilities within a defined scope of practice and licensing may enhance the effective use of RNXs. The findings reported here suggest that policies need to be revised to better utilise the skills of master-prepared nurses within NHs, as is advocated in the Institute of Medicine's Future of Nursing report (2011). Its first key message recommends that nurses should be able to practice to the full extent of their education and training. Moreover, the value of supervisory structures should be considered in policies regarding NHs' operation.

5.5 | Implications for Environment, Climate and Sustainability

While this discussion has not directly addressed environmental, climate or sustainability issues, it is important to note that healthcare organisations, including NHs, play a significant role in environmental sustainability. Efficient utilisation of nursing skills and effective communication can contribute to more sustainable care practices, such as reducing unnecessary medical procedures or waste, while also sustaining the workforce needed to meet the increasing need in long-term care. Furthermore, policy changes and further education could also incorporate stronger foci on sustainability principles in healthcare.

Author Contributions

Franziska Zúñiga, Lauriane Favez and Christine Serdaly conceptualised the study. Lauriane Favez and Franziska Zúñiga collected the data. Christian Saladino, Franziska Zúñiga and Lauriane Favez analysed the data. Christian Saladino wrote the manuscript. Franziska Zúñiga, Lauriane Favez, Christine Serdaly, Dietmar Ausserhofer and Sabina De Geest gave substantial feedback to the manuscript. Christian Saladino, Franziska Zúñiga, Lauriane Favez, Christine Serdaly, Dietmar Ausserhofer and Sabina De Geest read and approved the final manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author, Franziska Zúñiga, upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.