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Validation of the newly developed Advanced Practice Nurse Task Questionnaire: A national survey

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Abstract

Aim: To describe psychometric validation of the newly developed Advanced Practice Nurse Task Questionnaire.

Design: Cross-sectional quantitative study.

Methods: The development of the questionnaire followed an adapted version of the seven steps described in the guide by the Association for Medical Education in Europe. A nationwide online survey tested the construct and structural validity and internal consistency using an exploratory factor analysis, Cronbach's alpha coefficient and a Kruskal–Wallis test to compare the hypotheses.

Results: We received 222 questionnaires between January and September 2020. The factor analysis produced a seven-factor solution as suggested in Hamric's model. However, not all item loadings aligned with the framework's competencies. Cronbach's alpha of factors ranged between .795 and .879. The analysis confirmed the construct validity of the Advanced Practice Nurse Task Questionnaire. The tool was able to discriminate the competencies of guidance and coaching, direct clinical practice and leadership across the three advanced practice nurse roles clinical nurse specialist, nurse practitioner or blended role.

Conclusion: A precise assessment of advanced practice nurse tasks is crucial in clinical practice and in research as it may be a basis for further refinement, implementation and evaluation of roles.

Impact: The Advanced Practice Nurse Task Questionnaire is the first valid tool to assess tasks according to Hamric's model of competencies independently of the role or the setting. Additionally, it distinguishes the most common advanced practice nurse roles according to the degree of tasks in direct clinical practice and leadership. The tool may be applied in various countries, independent of the degree of implementation and understanding of advanced nursing practice.

Reporting Method: The STARD 2015 guideline was used to report the study.

Patient or Public Contribution: No patient or public contribution.

1 | INTRODUCTION

Advanced nursing practice is an umbrella term describing 'a field of nursing that extends and expands the boundaries of nursing's scope of practice, contributes to nursing knowledge and promotes advancement of the profession' (International Council of Nurses, 2020). Several definitions describe distinct Advanced Practice Nurse (APN) roles, with the most common being Clinical Nurse Specialist (CNS) and Nurse Practitioner (NP) (International Council of Nurses, 2020; Tracy & O'Grady, 2018). While both roles may be performed in different clinical settings such as primary care, acute care or home care, they differ in focus, characterization and scope of practice: CNS provide direct and indirect clinical services (International Council of Nurses, 2020). They are experts in a specialized clinical field, providing care for complex and vulnerable patients and their families. CNS also provide education and advice to other healthcare professionals, implement interventions or care programs in the clinical setting and translate research evidence into clinical practice, thereby driving change and innovation on a system level. NP focus on direct clinical services (International Council of Nurses, 2020). They apply excellent clinical skills to assess, diagnose and manage health problems of patients and families. While the NP focuses primarily on the principles of nursing, the role is characterized by an enhanced level of autonomy and accountability compared to other nursing roles in respect to applying diagnostics, prescribing medication or ordering tests and treatments.

2 | BACKGROUND

Despite long-standing experiences with advanced nursing practice, there is still global heterogeneity regarding official regulations, as well as the implementation of APN roles and the role-specific scopes of practice for CNS and NP within different clinical settings (International Council of Nurses, 2020; Maier et al., 2017). There may be a lack of clear descriptions of scopes of practice as roles are developed in clinical practice and APN tasks are defined according to local needs (Donald et al., 2010). In countries like Switzerland, where advanced nursing practice is still at a developmental stage; however, the assessment of APN tasks is crucial for the further development of roles in clinical practice and for evaluating APNs' contribution to the care process. Various instruments are available to assess NP (Lin et al., 2016; Wilkinson et al., 2018) or CNS (Kilpatrick et al., 2013; Mayo et al., 2010). But not every existing instrument can be applied one-to-one in each clinical or geographical context.

2.1 | APN in the Swiss context

The successful implementation of APN roles is facilitated by a combination of educational programs and legal regulation to authorize advanced clinical activities and scopes of practice (Maier et al., 2017). Countries such as the United States, Canada or Australia provide successful examples in this regard. This contrasts with the situation in Switzerland, a country with a highly developed healthcare system. With its 20-years-plus tradition of master of nursing science programs focusing on advanced nursing practice, the number of nurses with this profile has been rising. A recent nationwide survey found a more than two-fold increase of graduates between 2013 and 2022 (Schweizer Berufsverband der Pflegefachfrauen und Pflegefachmänner (SBK), 2022). The majority of the 505 participants self-identified as working in an APN role (62%), mostly in the hospital setting (68%) and only few in primary care (11.2%). However, the paucity of national policies impacts the practice of APN roles: first, the absence of legal regulation prevents APNs from working within the full scope of practice as do their colleagues in the countries mentioned above. Second, the lack of an overall defined scope of practice and competencies leads to considerable role diversity and a divergence from international role definitions. Descriptions of APN roles even differ between Swiss cantons, clinical settings and occasionally within institutions. Third, the absence of a nationwide educational standard for master programs results in variation regarding the content of programs and its volume. Moreover, thus far the programs have primarily focused their curricula on the overall concepts of advanced nursing practice as opposed to providing specific training to become a CNS or NP. As a result, Swiss APNs often work in so-called blended roles instead of being assigned to a pure CNS or NP role (Donald et al., 2010). The description of Swiss APN roles and tasks in clinical settings (e.g. by the institution or the department hiring an APN) is commonly oriented towards Hamric's model of advanced nursing practice (Table 1) (Tracy & O'Grady, 2018). As the model incorporates all relevant APN competencies it also forms the basis for APN master programs in Switzerland.

Overall, a more profound understanding of clinical competencies as well as the scope of practice is still lacking. To assess APN tasks independently of a specific role (i.e. CNS, NP or blended role) or healthcare setting (i.e. hospital, primary care) we searched the literature to find a suitable instrument. As we could not detect a published instrument that was conceptually based on Hamric's model, we developed a new tool, the APN Task Questionnaire (APN-TQ). Mapping the current situation in view of APN tasks and competencies will help to inform clinical practice, educational programs and APN research of how to best support further advancement of APN roles.

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TABLE 1 Framework of competencies and the corresponding conceptual themes according to Hamric's model of advanced nursing practice.

	APN competency with explanation based on Hamric's textbook	The framework's conceptual themes
Central competency	*Direct clinical practice* Physical or interpersonal Tasks delivered in direct Contact with patient/family	• Perform advanced clinical tasks (e.g. diagnostics, prescriptions, assessments, referrals) • Coordinate care
Six core competencies	*Guidance and coaching* Person-centred approach in relationships and involving a patient/family in taking an active role in health management and treatment planning	• Support gaining knowledge • Support behaviour change • Support decision-making
	Consultation Expertise provided to professional colleagues to improve patient/family care	• Provide clinical knowledge to nurses • Provide clinical knowledge to other professional colleagues • Provide expert opinion on models of care
	Collaboration Active participation in a group with different stakeholders to accomplish a goal or common purpose	• Collaborate within the organization • Collaborate outside the organization • Collaborate on national level • Collaborate on international level
	Leadership Advancing quality of care and innovation, manage personal boundaries	• Change clinical practice • Ensure care quality • Mentor others • Manage boundaries
	Evidence-based practice Perform clinical decision-making based on a systematic and stepwise process	• Solve clinical problems • Translate evidence to practice • Evaluate practice • Disseminate findings
	Ethical decision-making Managing an ethical dilemma	• Recognize ethical dilemma • Address ethical dilemma • Use ethical decision-making model

3 | THE STUDY

3.1 | Aim and objective

The aim of this study was to describe the psychometric validation of the newly developed APN-TQ.

4 | METHODS

4.1 | Development of the APN-TQ

Several guidelines describe the development of new instruments (Polit & Yang, 2016; Portney, 2020). We used an adapted version of the Guide No. 87 by the Association for Medical Education in Europe (Artino Jr. et al., 2014) to develop the APN-TQ, test the face and content validity, reduce items and perform a pilot test.

4.1.1 | Conduct a literature review

Our literature review aimed to identify tools that assess APN tasks according to the competencies of Hamric's model of advanced nursing practice (Tracy & O'Grady, 2018). The search string (Table S1) retrieved 653 articles via PubMed in July 2018.

We were able to identify a review examining six questionnaires on the performance of APNs (Sevilla-Guerra & Zabalegui, 2019) and six additional articles (Baldwin et al., 2009; Kilpatrick et al., 2013; Lin et al., 2016; Mayo et al., 2010; Wangensteen et al., 2018; Wilkinson et al., 2018). The questionnaires assessed tasks of specific APN roles such as CNS or NP in specialized clinical fields like critical or paediatric care. There was also variation with regard to the questionnaires' underlying conceptual frameworks, with tools using the Strong Model (Mick & Ackerman, 2000) or guidelines promoted by professional organizations (Sevilla-Guerra & Zabalegui, 2019). However, none of the existing tools was conceptually based on Hamric's model.

4.1.2 | Conduct interviews and/or focus groups and synthesize the literature review and interviews/focus groups

To develop our conceptual framework we modified the guide's Steps 2 and 3 as we built upon a currently existing construct of Hamric's model of advanced practice nursing. The competencies are described in detail in Chapters 7–13 of the most recent textbook (Tracy & O'Grady, 2018). Based on the textbooks' descriptions of competencies we identified corresponding general tasks using the text as data, coding it and then building conceptual themes using

NVivo software (QSR International Pty Ltd, 2014). Table 1 shows our framework with competencies and conceptual themes. There is an important conceptual variance between Hamric's model and our framework: direct clinical practice in Hamric's model is surrounded by and linked with all other competencies, while our framework displays the competencies independently.

4.1.3 | Develop items

For each conceptual theme we defined measurable tasks, which were characterized by the activity itself and the quality of performing the activity with a professional attitude. For example, 'support decision-making' could be assessed as activity (e.g. encourage patients, lay out information for patients, simplify information on patient's level of understanding) and as quality (e.g. guidance is built on a professional relationship, interaction is attentive and empathic, respectful guidance).

Finally, we identified 62 tasks, leading to the development of 62 items within the seven competencies. As our aim was to assess APN tasks independently of the role (i.e. CNS or NP), the items were formulated on a rather conceptual level. In order to facilitate a common understanding, we added examples from different clinical settings to each item. The selection of examples was guided by the research team's own professional experience. That is, all except for direct clinical practice, where the choices were made based on Hamric's textbook (Tracy & O'Grady, 2018), a questionnaire by Kilpatrick et al. (2013) and the seven clinical activities as proposed by the International Council of Nurses and used in a study by Maier and Aiken (2016). Developing the APN-TQ in English allows the distribution in the German-, French- and Italian-speaking regions of Switzerland without the need for translations.

4.1.4 | Conduct expert validation

Face validity testing: four national experts in advanced nursing practice with an expertise as lecturer or researcher or head of nursing development and with knowledge of clinical settings in the German- and French-speaking regions supported the further development of the questionnaire. The experts provided feedback on the items during two in-person meetings and once in written form. An important modification was the decision to assess only the activity (i.e. frequency of performing a task within the last 30 days) and not the quality of the performance. The first reason for this was to shorten the questionnaire. And second, the experts judged that self-assessment of the quality would be a very subjective measure with questionable relevance. Further changes and adaptations based on the expert rounds were: re-wording of questions, examples and answer categories. After the modifications the questionnaire consisted of 37 items with four answer

categories: never, occasionally (1–10 times, approximately every third working day), frequently (11–20 times, approximately every second working day) or constantly (>20 times, almost every working day).

4.1.5 | Conduct cognitive interviews

Content validity testing was performed using two different methods: cognitive debriefing interviews and written content validation, including calculation of the content validity index (CVI). Four APNs, working as either CNS or NP, participated in single, cognitive debriefing interviews. The aim was to assess the comprehensibility, clarity and relevance of each item. Comprehensibility was examined using the think-aloud technique (van Someren et al., 1994). Participants were encouraged to verbalize their thoughts while reading each item. Additionally, they rated each item for its clarity (yes/no) and its relevance (very relevant, relevant, fairly relevant, not relevant). Overall, the items were rated as very comprehensible. We made three verbal adaptations for more specificity, for example: the item 'prescribe and monitor pharmacological therapies' was perceived as the description of two independent tasks. We kept only the verb 'prescribing' as this task reflects the higher autonomy and includes monitoring as well.

Eight APNs, working as either CNS or NP in Switzerland, and one international expert in the field of advanced nursing practice, participated in the written content validation. The aim was to assess each item regarding its relationship to the underlying construct (one of the seven competencies), clarity and relevance. The experts received a list of items in a re-arranged, randomized order and a separate document with the definition of the seven competencies. They were asked to assign each item to one competency. Overall, the assignment of the items to the competencies was very clear with only one 'wrong' assignment: most experts assigned item 18 to leadership instead of consultation. The clarity rating (yes/no) was very good overall and the majority of the questions were perceived as well formulated. The relevance of the items was assessed using the CVI. Items with a CVI >0.8 were regarded as important and remained in the questionnaire. Nine items with a CVI <0.8 were discussed within the team, of which two items were eliminated and seven were kept, as they were deemed conceptually important to assess the further development of APN in Switzerland (e.g. Items 3 and 5). The final questionnaire consisted of 32 items.

4.1.6 | Conduct pilot testing

The final survey was pilot tested at University Hospital Zurich. Feasibility was good and the response rate was 66%, with 29 participants out of 44 eligible. We made no further adaptations to the APN-TQ.

4.2 | Study design

A cross-sectional online survey tested the construct and structural validity and internal consistency.

4.3 | Settings and participants

Nurses were eligible for participation in the study if they met following criteria: (I) holding an academic degree such as Bachelor, Master or PhD; (II) self-identified as a nurse working in a role with extended nursing expertise similar to that of an APN. The inclusion criteria for the setting were: hospital with >100 beds, home care or primary care setting. The inclusion criteria were relatively broad because, although the formal entry level for APN is a Master's degree, we knew from our own clinical experience that nurses with a Bachelor's degree or master students were already working in APN roles. And also, inclusion by means of the APN title was not possible as this is neither regulated nor protected in Switzerland.

4.4 | Data collection

The online survey was distributed between January 2020 and September 2020, with a break between March and May due to the restrictions of the SARS-CoV-2 Pandemic. Recruitment depended on the setting. For the hospitals, we used the member index of the association of all Swiss hospitals (H+ Die Spitäler der Schweiz-Les Hôpitaux de Suisse-Gli Ospedali Svizzeri, 2019). Based on the index from April 2019, we extracted all hospitals with >100 beds and contacted a member of each hospital's nursing management (e.g. director, higher nursing manager) via email to inform them of our study. If the contact person agreed to participate, they received another email with study information as well as the link and QR code to access the online survey, which they forwarded to the hospital's APNs. Contact persons who did not respond to the initial email received a maximum of two reminders.

For the home care and primary care setting, APNs were recruited via the Academic Society for Home Care Nursing, which is a working group of the Swiss Association for Nursing Science. The reasons to recruit nurses via a professional organization were (I) the large number and diversity of home care organizations and primary care centres and (II) the relatively small number of APNs working in the primary care setting. The research team knew from its own network that many of them are organized and connected via the professional organization, which made it easier to contact the Academic Society for Home Care Nursing instead of all workplaces. All APNs who received the invitation to participate were encouraged to forward the email to other APNs in their professional network or setting. The STARD 2015 guideline was used to report the study.

4.5 | Ethical considerations

The development of the APN-TQ was part of a research project, which was approved by the Cantonal Ethics Committee Zurich (BASEC-No. 2018-01244). The online questionnaire was filled out anonymously and participation was regarded as informed consent.

4.6 | Data analysis

Descriptive statistics such as means, standard deviations (SD), and frequencies were applied according to the level of data.

The underlying dimensions of the APN-TQ were examined with an exploratory factor analysis (EFA) using orthogonal rotation (Varimax). Suitability of the data for factor analysis was assessed through the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity, with a KMO of >0.7 considered acceptable for further factor analysis. Deletion of items was considered for communality scores <0.2. Kaiser's Criteria (eigenvalue >1 rule) and the scree plot guided the decision regarding the number of factors.

Construct validity was explored by testing two hypotheses: (1) NP have higher scores in direct clinical practice competency compared to blended roles and CNS and (2) CNS have higher scores in the competency 'leadership' compared to blended roles and NP, which have the lowest scores. The proportion of time spent in each competency and the frequency of APN tasks were shown in proportion and calculated for the whole group, as well as for the three distinct roles (CNS, blended role, NP). Means of the sum scores for each factor were compared with a Kruskal–Wallis test for independent samples and a significance level of .05. Missing data were excluded pairwise.

Internal consistency was examined through the Cronbach's alpha coefficient (calculated for the total scale and for each subscale) and Cronbach's alpha if item deleted. As the APN-TQ had only four answer categories, we performed a sensitivity EFA using polychoric correlation. Data were transferred from the online survey platform to IBM SPSS, Version 26 (SPSS) for further analysis.

5 | RESULTS

5.1 | Sample characteristics

A total of 95 hospitals were eligible and contacted for participation. While 17 hospitals declined, most because they had not yet implemented an APN role, 15 did not respond, resulting in 63 who agreed to distribute the survey among their APNs. Due to the recruitment strategy via hospitals management and Academic Society for Home Care Nursing, the total number of eligible APNs in each hospital remained unclear and the response rate could not be calculated.

Of the 255 returned questionnaires, 33 were excluded because demographic information was not available. Sample characteristics

TABLE 2 Sample characteristics (*N*=222).

Variable	Level	*n*	%
Gender	Female	190	85.6
Age group in years	25–34	80	36.0
	35–44	65	29.3
	45–54	48	21.6
	>54	29	13.1
Highest degree	Nursing diploma (also enrolled in master program)	5	2.3
	Bachelor in Nursing Science (also enrolled in master program)	31	14.0
	Master of Nursing Science	170	76.6
	Master of Science in another discipline (Midwifery, Education, Business,…)	6	2.7
	PhD	3	1.4
	Other (Master of Advanced Studies)	7	3.2
Definition of APN role	CNS	106	47.7
	NP	33	14.9
	Blended role	81	36.5
Population	Adults	187	84.2
	Children	21	9.5
	Adults and children	14	6.3
Specialization	Medical/Surgical	76	34.2
	Oncology	32	14.4
	Primary Care: General Practitioner and Home Care	28	12.6
	Psychiatric-Mental Health	24	10.8
	Critical Care/Intensive Care Unit	20	9.0
	Geriatric medicine	12	5.4
	Neurology	11	5.0
	Palliative Care	8	3.6
	Emergency	5	2.3
	Other (e.g. pain management, forensic, wound care,…)	6	2.7
Work setting valid *n*=221	Hospital in-patient	116	52.5
	Hospital out-patient	19	8.6
	Hospital in- and out-patient	64	29.0
	General practitioner practice	8	3.6
	Home care	11	5.0
	Long-term care	3	1.4

Abbreviations: APN, advanced practice nurse; CNS, clinical nurse specialist; NP, nurse practitioner.

(*N*=222) are shown in Table 2. Most participants identified themselves as CNS (47.7%), followed by those with blended roles (36.5%) and NP (14.9%). The median time working as a nurse was 13 years (IQR 9–23), as an APN it was 4.7 years (IQR 2–6) and in the current APN role it was 3 years (IQR 1.5–5).

5.2 | Psychometric validation

5.2.1 | Exploratory factor analysis

The KMO measure of the 32 items was .883 and Bartlett's test of sphericity reached statistical significance (*p*=.000), indicating suitability for factor analysis. Seven eigenvalues were larger than 1 and although the scree plot did not really indicate a seven-factor solution, we chose seven factors because that matches with the number of Hamric's competencies (Figure 1). The seven-factor solution explained 54.93% of the cumulative variance.

The EFA was performed using a principal axis factoring technique and Varimax rotation. Table 3 shows the factor loadings. Values <0.2 were not displayed for better readability of the table. Not all item loadings matched with the framework's competencies (Table 1) as had been expected. Two groups of items loaded as expected: items 27–30 loaded on Factor 2 (evidence-based practice), Items 31–33 loaded on Factor 5 (ethical decision-making). Two items that is 18 (consultation) and 23 (leadership) loaded on the
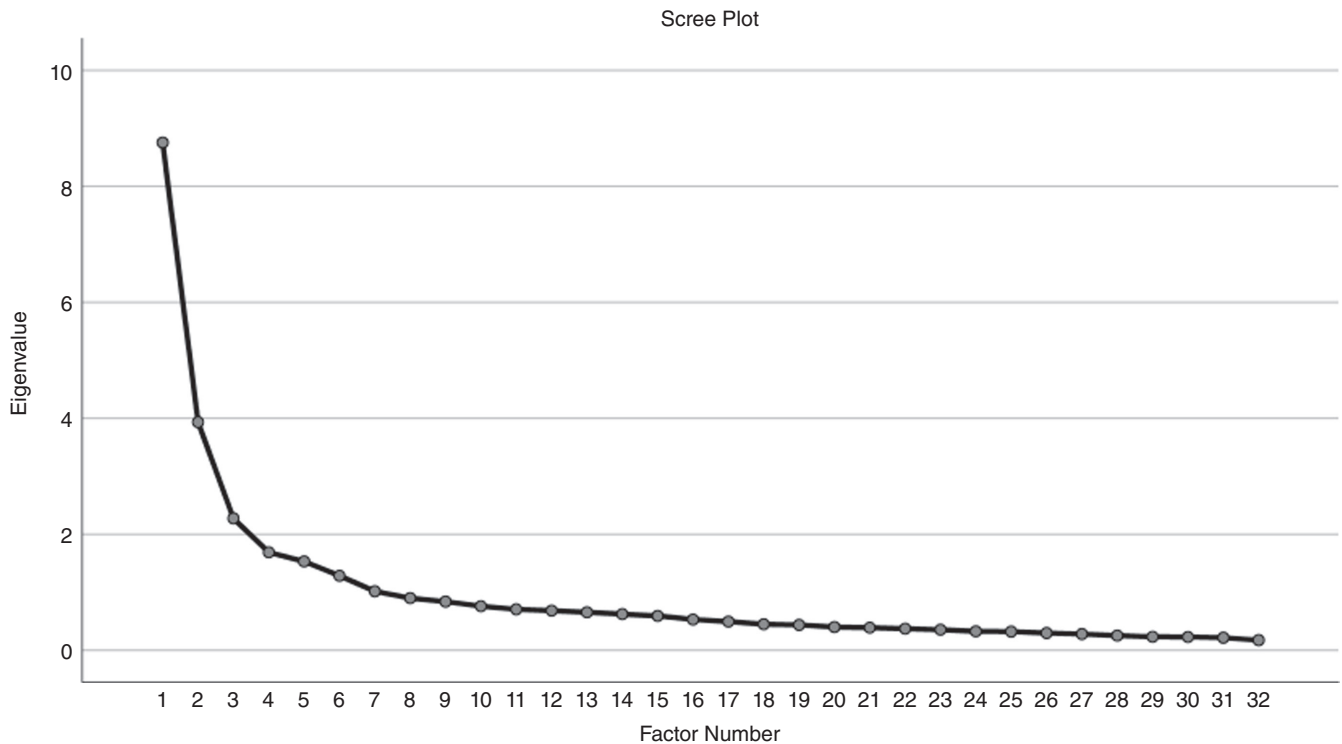
FIGURE 1 Scree plot of the Advanced Practice Nurse Task Questionnaire.

expected competencies but each had a higher loading on Factor 2 (evidence-based practice). Six items clearly loaded on another factor: Items 2, 9, 10 (direct clinical practice) loaded on Factor 1 (guidance and coaching), Item 14 (consultation) loaded on Factor 6 (collaboration) and Items 21, 22 (collaboration) loaded on Factor 4 (consultation).

Due to mixed loadings of items on the Factors 4 (consultation) and 6 (collaboration) we performed a sensitivity analysis without the competency collaboration (Table S2). Again, three items loaded higher on another factor as expected: Items 14, 18 (consultation) and Item 23 (leadership). The sensitivity EFA using polychoric correlation found similar results (results not shown).

5.2.2 | Construct validity

Our first hypothesis related to the performance of the competency direct clinical practice, which was split into two subgroups due to the loadings of Items 2, 9, 10. The analysis of discriminant validity, therefore, included Factor 1 (guidance and coaching, direct clinical practice), Factor 3 (direct clinical practice) and Factor 6 (leadership).

The Kruskal–Wallis test supported our hypotheses and revealed significant differences across the APN groups in the performance of all three competencies (Table 4). The two subgroups including *direct clinical practice* were more often performed by NPs compared to those with blended roles and the CNSs. *Leadership* was more often performed by CNSs compared to those with blended roles and the NPs. The other competencies showed no significant differences.

5.2.3 | Reliability

The internal consistency measured with Cronbach's alpha for the subscales ranged from .795 to .879, indicating an acceptable internal consistency for both the instrument and its dimensions (Table 3). Cronbach's alpha did not improve with the deletion of any item (Table 3).

6 | DISCUSSION

To the best of our knowledge, the APN-TQ is the first instrument to measure APN tasks based on Hamric's model of advanced nursing practice independently of the role (i.e. CNS, blended role, NP) and the setting (i.e. hospital, primary care). We developed a questionnaire deductively based on an existing model and performed a national survey for its psychometric validation. The analysis found an acceptable construct validity and reliability of the 7-factor solution, and the tool's ability to discriminate between APN roles within the competencies *direct clinical practice* and *leadership*.

Since the implementation of the first APN roles in Swiss university hospitals (Schmid-Mohler et al., 2011; Serena et al., 2015; Spichiger et al., 2018) the number of APNs has increased steadily. However, compared to other countries, Switzerland is considered a place where advanced nursing practice is still emerging (Maier et al., 2017). The sample characteristics reflect this context: the median work experience as APN (4 years) or in the current role (3 years) is relatively short given the 20 years that have elapsed since the first university offered a master program. Additionally, some nurses

TABLE 3 Rotated factor loadings of the Advanced Practice Nurse Task Questionnaire ($n = 222$).

No.	Item	Hamric's competency	Factor loadings							Corrected item-total correlation	Cronbach's alpha if item deleted
			1	2	3	4	5	6	7		
13	Support patients/families in gaining knowledge?	Guidance and coaching	.864							.776	.842
11	Support patients/families in decision-making regarding treatment and care?	Guidance and coaching	.786		.230					.778	.843
12	Support patients/families in changing behaviour?	Guidance and coaching	.782							.735	.850
2	Provide expert specialized assessments that are outside the scope of registered nurses?	Direct clinical practice	.631		.383					.667	.863
10	Coordinate patient/family care services in complex situations within and across care settings?	Direct clinical practice	.543			.227	.291		.216	.592	.873
9	Refer patients/families for specialized treatment to another healthcare professional?	Direct clinical practice	.539							.587	.874
28	Use scientific evidence to facilitate changes in clinical practice?	Evidence-based practice		.768					.208	.702	.717
29	Evaluate clinical practice using scientific methods?	Evidence-based practice		.699		.235				.619	.760
27	Use scientific evidence to solve a clinical problem?	Evidence-based practice		.645						.611	.762
30	Disseminate your evidence-based practice activities?	Evidence-based practice		.558		.372				.562	.784
7	Prescribe pharmacological therapies on your own authority?	Direct clinical practice			.773					.692	.767
6	Prescribe pharmacological therapy as delegated by a physician?	Direct clinical practice	.215		.735					.659	.765
4	Order laboratory and/or diagnostic tests on your own authority?	Direct clinical practice			.709					.594	.782
8	Prescribe non-pharmacological interventions on your own authority?	Direct clinical practice	.338		.532					.559	.792
5	Perform clinical reasoning and formulate a medical diagnosis?	Direct clinical practice		.247	.507					.502	.800
3	Perform diagnostic interventions that are outside the scope of a registered nurse?	Direct clinical practice	.233		.480					.503	.801
17	Provide clinical expert knowledge from other professions outside your organization?	Consultation				.737			.203	.671	.733
15	Provide clinical expert knowledge from your area of specialty to nurses outside your organization?	Consultation	.294			.669				.675	.731
16	Provide clinical expert knowledge in your area of specialty to colleagues from other professions within your organization?	Consultation	.253			.498		.219		.552	.764
21	Collaborate with teams across different organizations on the cantonal/national level?	Collaboration		.268		.495				.477	.780

TABLE 3 (Continued)

No.	Item	Hamric's competency	Factor loadings							Corrected item-total correlation	Cronbach's alpha if item deleted
			1	2	3	4	5	6	7		
22	Collaborate with teams across different organizations on an international level?	Collaboration		.229	.205	**.485**				.457	.786
18	Provide expert opinion related to (new) models of care in advanced nursing practice?	Consultation		**.397**		.373				.482	.780
32	Address an ethical dilemma on a system level?	Ethical decision-making					**.792**			.703	.663
31	Recognize an ethical dilemma in your clinical practice?	Ethical decision-making					**.744**			.673	.696
33	Lead a comprehensive ethical decision-making process?	Ethical decision-making		.212		.303	**.512**			.562	.809
19	Collaborate with nurses and nursing teams in your organization?	Collaboration		.204				**.858**		**.684**	.572
20	Collaborate with multi-professional teams in your organization?	Collaboration	.220	.292		.280		**.574**		.598	.676
14	Provide clinical expert knowledge in your area of specialty to nurses within your organization?	Consultation	.213			.228		**.475**	.375	.506	.773
25	Mentor others to help them grow and develop?	Leadership		.237			.233		**.631**	.592	.787
24	Foster teamwork to ensure high quality care?	Leadership		.513			.223		**.521**	.707	.732
26	Set clear boundaries to ensure your professional productivity?	Leadership		.434		.243			**.459**	.607	.781
23	Lead activities with the aim of changing clinical practice?	Leadership		**.518**				.252	.442	.637	.767
	Cronbach's alpha		.879	.806	.814	.795	.800	.762	.815		

Note: Values <0.2 were not displayed for better readability of the table. The highest loading factor and, if applicable, an additional high value are displayed in bold. The grey shaded values represent the final allocation.

TABLE 4 Discriminant construct validity ($n = 222$).

Competency as identified in the APN-TQ	Item number	Median			Degrees of freedom	H test statistic	p value
		CNS	**Blended role**	**NP**			
Guidance and coaching, Direct clinical practice	2, 9–13	0.92	1.33	1.67	2	20.22	.000
Direct clinical practice	3–8	0.17	0.33	0.67	2	30.60	.000
Leadership	23–26	1.50	1.25	1.00	2	8.60	.014

Abbreviations: APN-TQ, Advanced Practice Nurse Task Questionnaire; CNS, Clinical Nurse Specialist; NP, Nurse Practitioner.

worked in the role without (yet) having obtained a master's degree. This highlights the need for the clinical setting to employ APNs although the workforce is not big enough to allow for choice among those with a completed education. Finally, the lack of specific educational pathways is evident in the distribution of the roles, with nearly 40% working in blended roles and only the minority identifying themselves as NP. The assignment to a specific role may be clearer in the future as changes in the master programs are on the way. The University of Lausanne initiated designated CNS and NP programs in 2017 (Taillens, 2018) and other institutions followed in 2019. Our detailed results contributed to a better understanding regarding the current performance of APN tasks in the hospital and in primary care and might serve as a baseline for comparison in future assessments.

The psychometrics of the APN-TQ are comparable to other tools such as the Advanced Practice Delineation Tool, which is based on the Strong model and assesses five domains of practice (Chang et al., 2012). The APN-TQ's seven-factor solution explained nearly 55% of the variance and the result was supported by the satisfactory internal consistency of the scales. Additionally, the APN-TQ detected differences among the roles in performing the two competencies *direct clinical practice* and *leadership*. Overall, the APN-TQ is a valid and reliable tool to assess the performance of tasks according to Hamric's model of APN competencies.

Although we maintained the seven factors as described in Hamric's model of competencies, some items did not load on the factors or competencies as expected. Given the long history of Hamric's model, we judged it appropriate not to change or delete competencies. However, based on our results we would like to highlight two findings below.

Direct clinical practice and guidance and coaching: In Hamric's model the discrimination between *direct clinical practice* as well as *guidance and coaching* remains vague as both competencies are performed in direct contact with patients and families (Tracy & O'Grady, 2018). In our analysis three *direct clinical practice* items loaded on *guidance and coaching*, resulting in two groups of patient-focused competencies with diverse characteristics: the first group (Items 2, 9–13) were clinical tasks related to self-management and integrated care such as education, support in decision-making or coordination of care. These tasks have been commonly described as APN tasks in different settings and can, therefore, be considered typical tasks within the APN's scope of practice. The second group (Items 3–8) were clinical tasks related to diagnostic and therapeutic activities such as prescriptions, performance of diagnostic tests or

formulating medical diagnoses. Those advanced clinical tasks are also within the APN's scope of practice; however, those activities are also performed by physicians. The degree of task shifting from physicians to APNs depends on various factors such as the option of academic nursing education, workforce issues such as high availability of nurses and physician shortage, regulations and/or financial barriers (Maier & Aiken, 2016). In order to advance the current version of Hamric's model, the competencies *direct clinical practice* as well as *guidance and coaching* could be merged and further specified in patient/family-centred or diagnostic-therapeutic related activities. Moreover, assessing the performance of advanced diagnostic-therapeutic related tasks with the APN-TQ might serve as an indicator for APN role advancement within a setting or country. This, however, would need to be examined in further studies.

Consultation and collaboration: The items of the two competencies mixed although Hamric's model provides distinguishable definitions: *Consultation* is patient-oriented, relating to specific situations that ask for the APN's clinical expertise. *Collaboration* reflects activities in conjunction with professional colleagues. *Collaboration*, therefore, represents an omnipresent activity, which is independent of the profession or education. It would, therefore, be an option to discuss the importance and value of this competency generally within an APN model. However, our analysis did not support the elimination of the competency *collaboration* to improve the clarity of the competency *consultation*. In the sensitivity analysis without *collaboration* the two *consultation* Items 18 and 14 still loaded on other factors. Another option to improve the tool would be to rephrase these competency's questions in view of clarity and precision. *Collaboration* on the APN level may well relate to topics beyond the individual or patient level and might include activities on the population or even system level. Yet this expansion of *collaboration* might have more impact on professional APN role development than on the care provided by APNs, which once again raises the question of including this competency in a model. We suggest refining and adapting the questions on the basis of interviews with APNs to explore their perception of collaboration.

The APN-TQ was able to differentiate CNS and NP roles within the two competencies *direct clinical practice* and *leadership.* Using the definition from the International Council of Nurses (International Council of Nurses, 2020), the discrimination is comprehensible by focusing on leadership in activities in the CNS and in direct clinical practice in the NP role. In general the distinction of APN roles is not always precise and the competencies may overlap due to the needs of the specific population and setting. Activities and practice

patterns may even vary among CNS roles with different specialties (Mayo et al., 2010). However, role clarity including the tasks, the scope of practice and responsibilities is a prerequisite for successful clinical implementation of APN roles (Donald et al., 2010) and also guides the scientific evaluation of APN roles and their impact on outcomes (Laurant et al., 2018). Particularly in a country such as Switzerland, with its short APN history, role clarity may guide the understanding of the two major APN roles in important ways. The results also showed that the other competencies were less specific in defining the APN role. However, this might differ in countries with distinct education programs for both APN roles and a more comprehensive implementation of advanced practice nursing within the health care setting. While our results were based on a snapshot of the situation in Switzerland, we believe that the APN-TQ may also be used as a generic tool in countries with a similar expansion of advanced nursing practice compared to ours.

6.1 | Limitations

Several limitations should be considered in the interpretation of our results. In the development of the APN-TQ, Steps 2 and 3 of the AMEE guide were adapted by coding a text book instead of following the recommendations to conduct and analyse interviews or focus groups. Although we provided some guidance on the inclusion criteria such as academic education, we could not apply clear professional criteria (e.g. registration as APN) and, in addition, used a broad definition and allowed participants to self-identify as APN. The total sample might be considered relatively small in relation to the analysis, and as we were unable to calculate the response rate, the representativeness of the sample remains unclear. Finally, conducting the study during a pandemic, also in addition to the timeframe of the performance of tasks (last 30 working days) may have hindered the assessment of tasks performed less often. Nevertheless, we recommend re-distributing the APN-TQ in order to monitor the evolution of Advanced Nursing Practice in a specific setting or in another nationwide study. Additionally, the questionnaire may also be used in other studies to explore in more detail the deviation from the Hamric's model, and additionally, to assess APN tasks and examine their impact on clinical patient outcomes.

7 | CONCLUSIONS

The APN-TQ was developed based on Hamric's model of competencies and was validated by using data from a nationwide survey. Assessing and mapping APN tasks in Switzerland has contributed to the understanding of advanced nursing practice 20 years after its introduction into educational programs and about 15 years after being implemented in clinical settings. As the APN-TQ assesses tasks independently of the APN role and setting, it may also be applied in countries with more progressive implementation and understanding of advanced nursing practice. Additionally, the APN-TQ is a useful tool to advance clinical practice and research. Its application may serve to further refine and implement CNS or NP roles, to clearly describe their scopes of practice and to examine relationships between APN tasks and outcomes.

CONFLICT OF INTEREST STATEMENT

No conflict of interest has been declared by the authors.

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.15752.

DATA AVAILABILITY STATEMENT

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

STATEMENT ON STATISTICS

Marianne Müller is a statistician and co-author. Our main statistical approach covers psychometric tests including exploratory factor analysis and non-parametric tests. The authors affirm that the methods used in the data analyses are suitably applied to their data within their study design and context, and the statistical findings have been implemented and interpreted correctly.

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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