EVALUATION OF THE CLINICAL EDUCATION AND TRAINING OF NURSE PRACTITIONER STUDENTS AND ITS IMPLICATIONS FOR TEACHING, MANAGEMENT AND POLITICS

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Dedication and Acknowledgements

For Anton and Emil

I would like to express my sincere gratitude to the following people for their support during my studies and this project. Their inputs and the numerous in-depth discussions have always encouraged me during this Doctorate in Nursing Practice (DNP).

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Abstract

Background

The Bern University of Applied Sciences (BUAS), Department of Health, master's program in Nursing, introduced the Nurse Practitioner (NP) specialization in 2019, which is characterized by 400 hours of clinical training with practice partners (so-called supervisors). Until now, this clinical teaching has been predominantly conducted by physicians, largely implemented individually, and the final competencies have not been clarified.

Purpose

The aim of this DNP project was to evaluate the current clinical education of students in the master's program in nursing with the specialization NP at the BUAS, to examine the contents and the number of hours of clinical education and to derive recommendations for teaching, management, and politics in the German-speaking part of Switzerland.

Methods

In August and September 2022, all (former) students of the NP specialization (N=29) who had completed the clinical modules received two questionnaires (APNCAI with 44 items and NPC-SF with 35 items) to assess their professional competencies. The main purpose of this quantitative part was to obtain an initial baseline on this topic. In a further step, 10 interviews each with supervisors and with (former) NP-students were conducted between August and November 2022. The interviews were processed by means of thematic analysis and subsequently content analysis.

Results

The (former) NP-students experienced an increase in competence during/after their studies, acted increasingly holistically in the care of patients and experienced themselves as a resource in the interdisciplinary teams. All (former) NP-students as well as supervisors see the purpose and possible fields of application for NPs. They perceived the on-site clinical teaching as unclear, unstructured, without precise learning content and learning objectives.

However, this is not so much because of the clinical setting, but rather because the final competencies are not clearly regulated.

Recommendations & Conclusion

This study is an important step in obtaining an initial analysis and preliminary conclusions about NPs' clinical teaching. Furthermore, the study provides insights into the difficulties regarding the non-regulation and financing of the NPs on the part of the supervisors. Further analysis and studies on the topic are recommended.

Key Words

Nurse Practitioner, Clinical Education, Clinical Competencies, legal framework

Background and Significance

The healthcare system in Switzerland is based on broad primary care with family physicians, outpatient care at home, geographically close regional hospitals, larger cantonal hospitals and the five university hospitals with the mission for highly specialized medicine. The population has become accustomed to a broad range of top-quality medicine that is always accessible and provides effective and prompt care without much effort. In recent years, however, the Swiss healthcare system has come under increasing pressure, as in other Western countries (Federal Office of Public Health [FOPH], 2021). Demographic developments, digitalization, the changing needs of patients, and financial and political pressures are leaving their mark on healthcare in a country that until now has been characterized by modern technology, solid health insurance, government subsidies, and excellent infrastructure (Angerer & Liberatore, 2018; Meyer & Brauchbar, 2018).

Primary care physicians bear a great responsibility in this system, but increasingly also a great burden in view of the increasing social, financial, and political expectations. Diametrically opposed to this is the increasing shortage of specialists among family physicians, since the profession is becoming increasingly unattractive and there is a lack of young talent. The medical faculties and professional societies are trying to strengthen the importance of general practitioners with various strategies. For example, the creation of an institute for family medicine or to increase medical school enrollments, assuming a need for 1200-1300 graduates per year. In recent years, the number of study places for master's students in medicine has been increased drastically, so that from 2019 onwards, 1,100 medical graduates per year are expected to graduate. Compared with the graduation figures of 2009 of 720 new graduates

this represents an increase of more than 50%. These efforts have put the medical education system medical education system in terms of capacity (Universitäre Medizin Schweiz, 2016).

However, it is unlikely that these measures will be able to eliminate the impending loss of primary care physicians (Gysin et al. 2019; Sottas et al, 2019).

Due to the demographic development with more and more elderly people, chronically ill people and also an increased life expectancy in the population as a whole, the impending shortage of general practitioners, the constantly rising costs in health care as well as the general shortage of skilled workers also within nursing, the discussion about possible future roles or tasks of nursing especially in primary health care has gained strongly in importance both in Switzerland and internationally (Bischofberger et al., 2020; Gatewood & De Gagne, 2019; Merçay, Grünig & Dolder, 2021). The nursing profession is the most advanced in terms of advanced practice, both internationally and in Switzerland (Bischofberger et al., 2020).

In the Swiss health care system, a distinction is made primarily between the so-called "non-physician health care professions" (hereafter referred to as health care professions) and the medical and psychological professions. The health care professions currently include nursing, physiotherapy, occupational therapy, midwifery, nutrition and dietetics, optometry, and osteopathy. Human medicine, dentistry, chiropractic, and pharmacy are anchored in the Medical Professions Act (MedBG, German: Medizinalberufegesetz) and psychology in the Psychology Professions Act (PsyG, German: Psychologieberufegesetz) (FOPH, n.d.). The Federal Law on Health Professions (GesBG, German: Bundesgesetz über die Gesundheitsberufe) regulates higher education for the seven health professions as well as the profession's independent practice. The law and its ordinances were passed by parliament on September 30, 2016 and entered into force on February 1, 2020. (FOPH, 2021). Among other things, the GesBG regulates, in addition to the practice of the profession, the accreditation of the study programs, defines the graduation competences in the Health Professions Competence Ordinance (GesBKV, German: Gesundheitsberufekompetenzverordnung) and

establishes the Health Professions Register. The GesBG regulates the health professions at the tertiary level, i.e., all health professions with a bachelor's degree are regulated therein - in osteopathy, the master's degree was also considered. The inclusion of all master's degrees in the health professions was intensively discussed during the consultation of the law, supported by very many sides (especially health and educational institutions), but finally not considered due to political disagreement (bachelor's level represents the basic education) (Federal Department of Home Affairs [FDHA], 2014). These decisions have now led to the fact that neither the final competencies of a master's degree in nursing nor the associated functions within the Advanced Practice roles are regulated, governed, or controlled in any law, for example Clinical Nurse Specialist (CNS) or Nurse Practitioner (NP). In this context, the current regular professional practice, especially for midwives practicing freely or specialized nurses, can already be considered partially as Advanced Practice. Thus, the financing has not been clarified yet and the billing of APN services is difficult for the time being (APN-CH, n.d.)

Before the bologna-compliant, consecutive master's degree programs in nursing sciences started in Switzerland in 2002, the Swiss Professional Nursing Association (German: Schweizer Berufsverband der Pflegefachfrauen und Pflegefachmänner [SBK]) adopted the curriculum of the so-called "HöFa 1" in 1987 (German: HöFa = höhere Fachausbildung = higher professional education). This higher professional training in nursing taught, among other things, content on pain, stress, coping, anxiety, loss, and grief. "HöFa 1" was soon followed by "HöFa 2", which already included a two-year nursing science curriculum. The nurses who completed "HöFa 2" were among the pioneers in the Swiss health care system because they were employed as nursing experts (today CNS) and were responsible for further development and quality assurance in nursing practice (Lüthi, 2020).

Today, most nurses with a master's degree continue to work as CNSs, contributing to the advancement of professional practice, mentoring other nurses, taking on and managing complex patient cases, and counseling family members (APN-CH, n.d.). Over the past decade or so, more patient-specific Advanced Practice Nurse programs have been developed in health care settings - this yields potential within multidisciplinary teams, in the care of multimorbid patients, or in palliative care, where NPs could take on case management tasks to relieve the burden on physicians (Bischofberger et al., 2020).

The Bern University of Applied Sciences, School for Health Professions (BUAS), has existed since the beginning of the 2000s - this was due to the decisions of the Swiss Conference of Cantonal Health Directors to manage all non-medical health professions throughout Switzerland at the level of a university of applied sciences during the new education system. As a result, the first bachelor's degree programs in nursing and physiotherapy started in 2006, followed by the bachelor's degree program in nutrition and dietetics and disciplinary research in 2007, the bachelor's degree program in midwifery started the following year, and the two master's degree programs in physiotherapy and nursing started in 2010 (BUAS, 2022). The first master's programs in nursing already had a focus on Advanced Practice Nurse, but the curriculum was very broad and rather non-specific (more CNS profiles). In 2019, there was then a focus on three immersions: Nurse Practitioner, Clinical Nurse Specialist, and Research and each major has 90 ECTS (BUAS, 2020). In Switzerland, it is currently possible to complete the Master of Science with 90 or 120 ECTS, depending on whether the master's degree is offered at a university or university of applied sciences. Then in the fall of 2021, the Psychiatric Mental Health Nurse Practitioner specialization was added. In the NP specialization, students expand their professional competencies in clinical assessment, their knowledge of pathology as well as pharmacology, and learn skills in diagnosis and multiprofessional treatment planning. Practical training under

clinical supervision supports and supplements the theory-practice transfer. To this end, students complete assignments in hospitals or in family doctor's practices; this is done within the framework of contractually regulated practice partnerships. Such a practice partnership includes the provision of clinical mentorship study slots totaling 50 days (400 hours) distributed over the entire study period (BUAS, 2020). This number of hours was based on a calculation of the hours to be realized within the 90 ECTS and does not correspond to other scientific publications, such as Fulton et al. (2017). When designing the course, the framework of 90 ECTS had to be adhered to. For NP students, the modules "Leadership" and "Communication" were deleted without replacement to integrate the required 400 clinical hours.

The clinical supervision is on average one to two hours per day - a logbook and the module handbooks are used as support and orientation. The goal of the instruction and training is for students to increasingly be able to care for patients independently, with only brief assessment or correction by supervisors (BUAS, 2021). Possible tasks focus initially on less complex complaints, which can be assessed by the NP, e.g., anamnesis or the medical care of elderly patients with chronic conditions, who are repeatedly called to the family practice for routine examinations. The canton of Bern is the only canton in Switzerland that financially compensates the practice companies for the training services (150 Swiss francs per day) through the Health, Social and Integration Directorate (BUAS, 2020). For more detailed information on the Swiss health care system, see Appendix C.

When BUAS introduced this program in 2019, it relied on many voluntary practice placements to distribute students at the start of the program. The professional and competence image of the NP was and is very unfamiliar and completely new for many primary care providers (Gysin et al., 2019) - the BUAS could only fall back on practice experience values

from abroad and was thus dependent on a lot of "goodwill" from the practice partners. The competencies to be learned, which were specified in the corresponding module, were based on the valid literature, especially from the USA and Scandinavia (American Association of Colleges of Nursing [AACN], 2021; Ljungbeck et al., 2020), and the supervision or instruction of the practice partners could only be ensured superficially, since in Switzerland it has not yet been regulated what NP must learn during their studies in clinical teaching, how they learn, and which (generally valid) final competencies they must have. This is more important so that in the future the activities of the NP can also be remunerated, and it has its own area of responsibility. Furthermore, there is a lack of information on the training of supervisors, on the requirements of the practice sites and on the content to be learned at the practice sites (Bischofberger et al., 2020; Sottas et al. 2020).

Purpose

The aim of this DNP project work is to evaluate the current clinical education of students in the master's program in nursing with the specialization NP of the Bern University of Applied Sciences, School of Nursing, to examine the contents and the number of hours of clinical education and to derive recommendations for teaching/practice places, management, and politics in the German-speaking part of Switzerland.

Review of Current Evidence

Search Strategy

Literature searches were conducted from November 11-30, 2021, in Google, CINAHL (via EBSCO), Cochrane, MEDLINE (via Pubmed), and University Libraries - Research Guides - Doctor of Nursing Practice - DNP Projects databases. Between 954 - 4786 articles appeared in the initial search entries. Subsequently, the inclusion and exclusion criteria and the keywords were adjusted until a certain saturation or redundancy in the articles was reached. Subsequently, 31 articles were identified as suitable, of which 28 were studied in

more detail, and in the final analysis phase 18 articles and documents were included in the processing. For detailed information on the literature search and a PRISMA Flow Diagram, see Appendix B.

Main Topics

- Who should provide clinical education in the field?
- No standardized (clinical) training and teaching of nurse practitioners => no clear competency profile and the number of hours is inconsistent
- Core Competencies
- Increase in NP education programs and concurrent lack of clinical education settings and partners
- Compensation for clinical education

Variables, Factors, and Concepts

The studies considered all referred to the NP definition from the International Council of Nursing (ICN): "NPs are clinical leaders who can influence health service delivery and the profession at large" (Gardner et al., 2020). Furthermore, most researchers discussed the PEPPA framework (Gysin et al. 2019) - particularly in the context of clinical decision making and leadership (Ljungbeck et al., 2020). The studies also reviewed all point to professional experience-although, according to the authors, this has tended to be described as irrelevant to clinical education in previous studies. The studies also explained that, in addition to purely clinical training, the research findings also pointed to cultural competencies as well as communication skills - not least, (clinical) training was also an attitude issue for NP study participants (Roberts et al., 2020; Taylor et al., 2021).

About 60% of the included studies deal with the concept of "preceptorship" - this in the sense of supervision or teaching in the clinical setting. There are still many uncertainties

and questions about this topic, including the role, function, and requirements of the supervisor (Hawkins, 2019; Lloyd Doherty et al., 2020).

Current State of Knowledge

The discussion about the future role of non-physician health care professionals in primary health care has gained momentum in recent years, not only in Switzerland but also internationally (Gysin et al., 2019). The background is the predicted change in the health care system due to demographic and epidemiological developments: the increasing need for care (more and more elderly people in need of care and multimorbid people with chronic diseases) is confronted with an impending shortage of primary care physicians, nurses, and other health care professions (Sottas et al., 2019). New occupational groups with competencies previously held by others always create fears and are therefore rejected or at least critically questioned. Already in the training or development of the curricula, the definition of these competencies is thus a major challenge. Politicians in Switzerland have not yet defined any national guidelines. The responsibility for the curricula therefore lies with the educational institutions. In the past, this had the advantage that the curricula could be different at the beginning, before it is now time to generate a nationally uniform clinical training system (Bischofberger et al., 2020).

The goal of the NP is to provide more accessible, high quality and cost-effective healthcare. Achieving this requires clinical and professional competencies that have been learned in a rather unstructured manner until now. These competencies are primarily acquired or enhanced in clinical mentorship, i.e., at the interface between study and practice. The clinical mentorship will be taken over primarily by physicians with many years of experience until a sufficiently high level of competencies and experience has been built up among nurse

practitioners to ensure that this function is (for the most part) internal to the profession (Bischofberger et al., 2020).

Gaps

All authors agree that there is a need for a uniform, standardized curriculum for clinical education. The AACN (2021) describe in their foundational document the concepts needed such as clinical decision making, communication, empathic care, diversity/equality/integrity, ethics, evidence-based practice (EBP), health policy, social determinants of health. However, through conversations with practice partners (so far only physicians), the BUAS knows that they are unable to translate these conceptualizations into their everyday practice because they have a different understanding of medical teaching. They lack concrete technical and measurable criteria and goals so that they can translate the competencies to be learned by future NPs into their supervision - this empirical evidence is also provided by Roberts et al. (2017) and Schallmo et al. (2019). Furthermore, practice partners do not know the contents of the complete curriculum - this in contrast to the human medicine curriculum of medical students. The exact (technical) skills of NPs are poorly described in the literature and are therefore very heterogeneous and unclearly stated in individual curricula (Gardenier et al. 2021; McNeil & Jakubisin Konicki, 2021).

Another point concerns the legal situation - if the future NP learns concrete clinical skills, they must also take responsibility for their decisions in this area - here again the question arises whether the NP takes over delegated medical activities or whether they have completely their own area of responsibility.

In the Swiss literature, no reference was made to the ECTS number of 90 or 120, while other research results show that the number of clinical training hours is elementary.

Therefore, the number of ECTS required in Switzerland would certainly have to be discussed in the future.

Appraisal and Synthesis

The studies assessed have both qualitative, quantitative, and mixed methods approaches, come exclusively from Western countries, and show that the problem has been recognized. An astonishing number of studies came from authors with Doctor of Nursing Practice (DNP) backgrounds. Due to the increase in NP students and to continue to position NPs in a sustainable way, including politically, clear clinical learning criteria as well as high-quality, standardized, and adequately compensated training sites are needed (Fulton et al, 2017). These frameworks would also be a prerequisite for further advancing the discussion regarding own responsibilities and compensation for postgraduate activities.

Build a Case

The preceding explanations as well as the extensive literature review with the corresponding results prove that the question or the goal of the project work is the logical consequence of the evidence available to date and has a high relevance for general healthcare in Switzerland as well as for teaching, politics and for management in a further step. Clark et al. (2018) show that management also needs to have in-depth knowledge of NP clinical training to take this into account in organizational developments and to develop appropriate interprofessional skill-grade mix models.

Conceptual Framework/Theoretical Model

At the beginning of the master's programs in nursing science, the training and the final competencies of the NP in Switzerland focused primarily on the six core competencies according to Hamric (Tracy & O'Grady, 2018), which include coaching, consultations, evidence-based practice, leadership, interprofessional collaboration and ethical decision

making. NP proposals that emerged in the field also invoked this model, implementing and evaluating projects using the PEPPA (Participatory, Evidence-based, Patient-centered Process for APN role development, implementation, and evaluation) framework (Bryant-Lukosius et al., 2016). As the clinically oriented activities of trained ANPs increased, as did the new NP specialization at BUAS, the curriculum had to be revised accordingly. The Essentials of AACN (2021) were considered, but not explicitly applied to the present circumstances (framework, laws, geographic location, voluntary nature of supervision, lack of compensation and legal clarification, etc.).

The use of conceptual and theoretical frameworks in the development of curriculum in NP programs is critical to clearly define and protect the Scope of Practice. According to Baumann (1998), unlike other health professions, NP curriculum needs to focus on their uniqueness rather than on skill-based tasks and competencies. Therefore, he suggests using a conceptual nursing model and theory as opposed to a biomedical model. This will allow future NPSs to interpret information in a way that is different from the biomedical model and take a holistic view of patients (Wilson et al., 2015).

From a global perspective, the roles of NPs (and CNSs) are still very new, partly unknown, and therefore interpreted and lived differently, which makes it difficult to standardize training and the associated quality assurance. In terms of the theoretical framework, this study therefore draws on the role development of Benner (1982) and The Core Competencies for Professional Nursing Education (AACN, 2021).

The development of Nurse Practitioners' clinical competence begins during their undergraduate studies. Here they complete assignments in clinical practice for the first time and acquire the theoretical foundations at the same time. To enter the master's program thereafter at the BUAS, students must have at least two years of direct, high-percentage work

experience. Therefore, the clinical experience of NP students must be assessed individually in each case. The clinical development process proceeds gradually in phases and is enhanced by regular continuing education. Benner's (1982) theoretical framework can be used to understand learning, development of clinical competencies, and problem-solving skills in the context of their ongoing professional experience. Benner emphasizes that the acquisition of clinical competencies is closely related to the patient's perspective; it is important to know the patient and to be emotionally involved in their care. Furthermore, Benner (2017) emphasizes the importance of situational awareness and learning in the situation to gain a holistic and deeper understanding of the patient.

According to Walker and Avant (2019), conceptual frameworks show the logic behind the relationships between concepts and variables to enhance explanation and understanding. Therefore, appropriately fitting frameworks should be used to establish a meaningful connection between the (clinical) curricula, the goals, and the content of education. Since the present work focuses on the evaluation of clinical education in terms of curriculum, goals, infrastructure, and supervision, the theoretical framework of the Core Competencies for Professional Nursing Education of the AACN (2021) was consulted in addition to Benner's competency model. The revised version is based on the basic assumptions of nursing as a discipline, the foundation of liberal education, and the principles of competency-based education. furthermore, the authors also addressed the future of nursing (what will nursing education look like in the 21st century?). In doing so, they include the topics of diversity, equity, and inclusion, and discuss the demographically driven shift of patient settings from acute hospital to rehabilitation/long-term care/palliative care and highlight the importance of prevention. Other important content represents systems-based practice, digitization, outreach and experience, academy-practice partnerships, and lifelong learning (AACN, 2021).

The model then identifies areas and concepts that should be considered in the education of advanced practice nurses and explain how to interpret the competencies within one of the defined domains (Table 1). In addition, eight concepts are described, each of which provides the foundation, but also acts as an interface within the domains and promotes the transferability of the content learned (Table 1).

Table 1: Domains and Concepts

Domains:	**Concepts:**
Knowledge for Nursing Practice	Clinical Judgement
Person-Centered Care	Communication
Population Health	Compassionate Care
Scholarship for Nursing Discipline	Diversity, Equity, and Inclusion
Quality and Safety	Ethics
Interprofessional Partnerships	Evidence-Based Practice
System-based Practice	Health Policy
Informatics and Healthcare Technologies	Social Determinants of Health
Professionalism	
Personal, Professional, and Leadership Development	

The AACN (2021) express that there are many different programs and ways that future NPs are trained and different qualification processes. This leads to the fact that the final competencies are very heterogeneous and that these are not understandable and transparent for the practice and for the decision makers (among others in politics and in the medical profession). This in turn weakens the role and understanding of the NPs. To improve this situation, the AACN (2021) now distinguishes between two levels of sub-competencies. The first level is aimed at the basic training of nursing professionals with the corresponding final competencies at bachelor's level, who then gain their first professional experience as entry-level professionals. The second level is now about deepening knowledge, gaining breadth in terms of content and specializing within the ANP concept to focus specifically on complex patient situations and extended functions of responsibility (NPs, CNS, Management, Administration, Politics). It is evident here that the Advanced level cannot be achieved through training alone. Professional experience is needed and many years of specialization in

a field/patient group should be sought. For this purpose, the regulations describe various contents and requirements of the training at the Advanced Level, which are based on definitions from nationally recognized professional organizations (AACN, 2021).

Advanced Level Practicum Experience

This area builds on the practical experience gained at the first level. The authors argue that practice experiences are necessary to integrate professional learning, promote innovative thinking, and test new potential solutions to clinical practice or systems problems. Unfortunately, they do not comment on several years or hours regarding professional experience. In terms of infrastructure, they comment that the program is responsible for providing sufficient and appropriate clinical facilities/places so that students can achieve the second level and associated professional competencies. The learning objectives and learning content for the second level are taught using appropriately modern and evidence-based learning methods (AACN, 2021). These indications are very exciting for the implementation resp. the basis for the further development of the study program at BUAS.

Competency Attainment and Practice Experiences

The second area again addresses the requirements or expectations regarding participation/attendance (sense of duty, reliability, role model function) during training. The authors again describe the importance of sufficient clinical experience to be "certified" by the relevant national professional organizations and to meet the requirements of an ANP role. Unfortunately, exact numbers or criteria that make the ANP requirements quantifiable and comparable are again lacking (AACN, 2021).

Advanced Education Clinical/Practice Hours

This section addresses the required number of direct and indirect practice hours. According to the authors, this number may vary by specialty and role, but it is important to ensure that the required hours reflect the breadth and quality of expertise advanced nursing

practice requires and that patients as well as work colleagues in the interprofessional setting have confidence in the clinical skills (AACN, 2021). Further, the authors discuss the importance of redundancy during education (repetitively practicing and experiencing clinical skills) and advocate for a minimum number of cases or hours; however, they remain adventurous and want to include consideration of the student's role, experience, personal needs, and curriculum (AACN, 2021). The theoretical regulations define a minimum of 500 practice hours, which must be completed after the basic training to achieve a progressive nursing practice. Here again, reference is made to the individual needs of the students (possibly more hours are required) and the infrastructure or the teachers are made responsible for ensuring that the quality requirements/quality assurance of these practical hours are met. Finally, the authors state that this minimum of practice hours is not conclusive but must be based on future role developments and experiences from practice (AACN, 2021).

In the development of the clinical training of nurse practitioners in Switzerland, the specifications of the AACN (2021) were considered, but due to the design of the curriculum, they could not be fully implemented. Accordingly, BUAS requires 400 hours for the Master of Science training (BUAS, 2021) and 600 hours are taught for the Diploma of Advanced Studies (DAS) Advanced Nursing Practice-plus at the University of Basel (Universität Basel, n.d.).

Immersion Practicum Experiences

This section addresses the sustainability of competency development and aims to ensure that advanced nurse practitioners specialize in a particular population or specialty and develop this care competency in a targeted manner (AACN, 2021).

Simulation

The authors explain that practice experiences in a real-world practice setting are the most important component of the nursing curriculum and hold both institutions of higher

education and health care institutions accountable for this. Institutions of higher education are expected to use simulations in their hands-on curricula, which are aligned with current best practice standards, as well as other pedagogical/didactic techniques to ensure that students complete the most diverse and clinically oriented course of study possible (AACN, 2021).

DNP Scholarly Project/Product

The final chapter discusses the role of advanced practice in society. Due to the future challenges in healthcare, there is a need for nurses who, based on their competence profile, can influence, and guide the transformation of healthcare accordingly. However, this requires appropriate communication skills, a focused image of interdisciplinarity, scientific knowledge, leadership skills, and the ability to work in a team. In particular, the scientific work must comply with the latest guidelines, have a high integrity, systematic and respect in relation to research. Furthermore, scholarly work aims to improve clinical practice, which must be done in collaboration with practice partners whenever possible (AACN, 2021).

Method

There are many references in the literature as to how the current recommended 500 clinical training hours came about and approximately what they should include (AACN, 2021; Lloyd Doherty et al., 2020). However, there is a lack of both qualitative and quantitative statements or feedback on this from clinical supervisors and from the students themselves. Therefore, this study will further investigate the experience of clinical supervision as well as the supposed completion competencies, linked to theory-practice transfer. The results of the study will help to validate or adapt the curriculum, provide an initial starting point to conduct further research in the quantitative area of competencies, raise awareness of the graduation competencies among the management level of healthcare institutions, and underpin and accelerate political and regulatory efforts.

Study Setting

The study environment for this project is the University of Applied Sciences, School of Health Professions, in Bern, Switzerland, which offers a Master of Science in Nursing program. The study program focuses on four specializations: Research, Clinical Nurse Specialist, Nurse Practitioner and Psychiatric Mental Health Nurse Practitioner. This study evaluates the clinical education in the specialization Nurse Practitioner. The content of the curriculum and the names and contact details of the study participants are supplied by the corresponding study program.

Study Population

Nurse Practitioners

With the intention of obtaining the richest possible information on the activities and competencies of NPs, a targeted selection process of participants was conducted. For the interviews, out of the possible 29 students of BUAS (finished the clinical education since 2019), 10 students are requested at random by mail and personal telephone contact. There are no specific inclusion or exclusion criteria for this setting other than availability and voluntariness. When the author makes contact by telephone, a standardized inquiry or information is made according to a checklist. The mail will also contain a standardized text including an information letter.

Besides the interviews, all (former) NP-students (N=29) will receive two questionnaires along with an informational letter, one questionnaire by mail and one questionnaire by email. These questionnaires focus on the competence development: Advanced Practice Nursing Competency Assessment Instrument (APNCAI) and the short form of the Nurse Professional Competence Scale (NPC-SF).

Supervisors

BUAS currently works with 23 different health care institutions in the NP immersion. These healthcare institutions consist of various acute hospitals (with different departments) and general practitioners in the German-speaking part of Switzerland. Of these institutions, ten are randomly selected and solicited by telephone. There are no inclusion or exclusion criteria except time availability and voluntariness. In the selection process, care is taken to achieve as balanced a mix as possible between acute and primary care. The supervisors will also receive a standardized information letter and participation will be voluntary.

Supervisors are either physicians with a residency in the appropriate discipline or trained Nurse Practitioners with at least two years of experience in the current patient setting.

Study Design

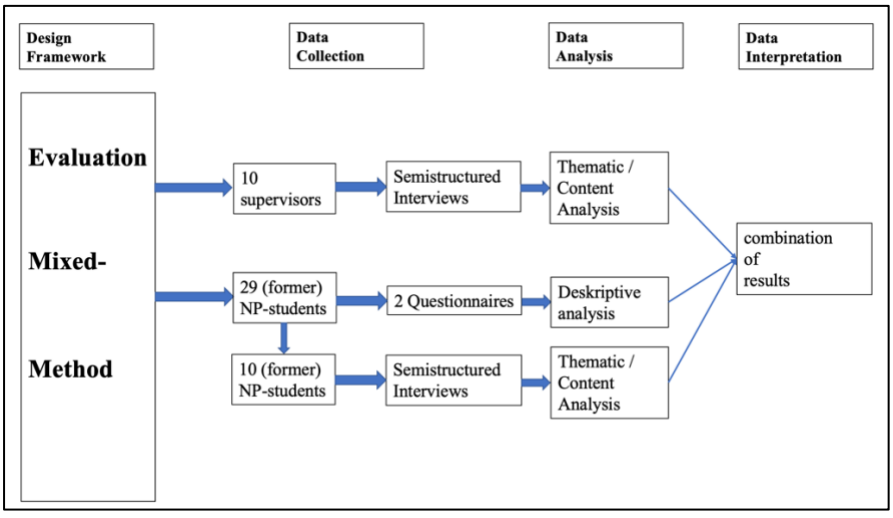
To date, little to no research exists on this topic and the development of NP roles can be defined as complex. Since this study is an initial evaluation, it needs broad coverage and subjective perceptions from the students' and supervisors' perspectives. Following Polit and Beck (2021), a mixed-methods design will therefore be chosen for this evaluation study (see Table 2). They describe that this design has the following advantages and is therefore suitable for this study:

- Complementarity: by choosing both approaches, the best of each approach can be extracted and combined.
- Practicability: given the complexity of NP development, it is practical not to be bound by a particular methodology when asking the questions in this study, but to have the questions answered by different methodologies.
- Enhanced validity: due to the limited data and literature and the rather small sample, the mixed-methods design offers the possibility to better interpret the data and draw conclusions from the results.

The methodological approach will therefore have both a qualitative-descriptive and quantitative component:

- Semi-structured interviews with ten (former) NP-students who completed the clinical education since 2019
- Semi-structured interviews with five supervisors in a general practitioner setting
- Semi structured interviews with five supervisors in an acute care setting (hospital)
- NP-students: all (former) NP-students who have successfully completed the clinical course will receive the "APNCAI" by email and the "NPC-SF" questionnaire by mail. The questionnaires will be mailed at the beginning of the data collection to allow sufficient time for participants.
- Collection of descriptive data, such as age, gender, education, work experience, etc., from all participants.

Table 2: Research Process by Holloway & Galvin (2016)



Translational Framework

To evaluate clinical education, this study draws on the fifth edition of the Criteria for Evaluation of Nurse Practitioner Programs from the National Task Force (2016) on Quality Nurse Practitioner Education (NTF). In the report, they describe various uses within the six

dimensions, including to evaluate NP programs of study. This model will be used in this study as a guide for the interview questions.

Organization and Administration

In the first dimension, the report addresses criteria related to the organization and administration of the training, for example, whether the director of the NP program himself has an NP training, whether the lecturers have a doctorate and a pedagogical-didactic training, and whether the persons teaching clinical content also have corresponding clinical competences and experience in the respective specialization (NTF, 2016).

Students

The second dimension addresses admission requirements and student learning. NP programs must ensure that the requirement criteria (prior education, clinical experience) for admission to the program are adequate, that all students are treated equally, and that learning assessments and progress are appropriately reviewed and documented. furthermore, they must ensure that all programs (part-time, full-time) are taught the same content with the same quality (NTF, 2016).

Curriculum

The third dimension describes the importance of a coordinated and constantly updated curriculum. The authors call for faculty leadership of curriculum development, student involvement in evaluating learning content and objectives, and advanced didactic and pedagogical teaching techniques. furthermore, content must target nationally applicable standards, be congruent with generally applicable clinical evidence-based guidelines and teach the core competencies of the AACN. They, too, point out that clinical training at the master's level must include at least 500 hours as well as some content specialization (NTF, 2016).

Resources, Facilities, and Service

The fourth dimension is about the university's infrastructural facilities. Students have a right to an appropriately modern IT structure with access to databases, sufficient rooms, skills and simulation training and libraries. The authors also describe a "student-teacher ratio" (6:1), which can vary depending on the subject. Instructors must be appropriately trained and licensed. Furthermore, the university must allow group or individual work and offer the option of face-to-face, hybrid or online teaching (NTF, 2016).

Faculty

The penultimate dimension again explicitly addresses faculty teaching requirements. The concept describes that faculty must also have some skill-grade mix and that faculty must specialize in appropriate teaching content. In addition to this specialization, faculty need pedagogical-didactic training with registration and must continually develop these skills (lifelong learning). The faculty is (co-)responsible for ensuring that teaching techniques meet the latest requirements and that new, inexperienced teachers receive a structured induction program combined with a mentor (NTF, 2016).

Evaluation

The last dimension deals with evaluation. The concept requires regular, systematic evaluation, involving both teachers and students. The framework conditions, the lecturers and the curriculum content are evaluated. The results are documented and communicated and considered in the further development of the courses (NTF, 2016).

Instruments

Questionnaires

The assessment of the (former) NP-students own experience of their self- reported clinical competence will be done by using the APNCAI which was developed in Spain in

2017 and assesses the competencies of nurse practitioners in both primary care and hospital settings (Sastre-Fullana et al., 2017). The cultural and linguistic translation into the Swiss setting was done by ZHAW School of Health Sciences for internal university use, and the instrument is considered valid and reliable, and the authors agreed to use this questionnaire for this study. The instrument consists of 44 items, which are divided into eight dimensions: evidence-based research and practice (eight questions), clinical and professional leadership (four questions), professional autonomy (eight questions), interprofessional relationship and mentoring (six questions), quality management (four questions), nursing management six questions), education and professional training (four questions), and health promotion (four questions) (Carvalho Pena Dias et al., 2022). Responses are given using a five-point-Likert scale with the following alternatives to allow participants to express how often they engage in the following behaviors in their professional practice: never – almost never – sometimes – almost always – always. The English version of the APNCAI can be found in Appendix D.

The Nurse Professional Competence Scale Short Form (NPC-SF) will be used to measure (former)NP-students self-reported competence. It was translated into German and is reliable and validated (Kellerer et al., 2020; Raab et al., 2020; Kellerer et al., 2023). It contains 35 items which are distributed into six competence areas: Nursing Care (five items), Value-based Nursing Care (five items), Medical and Technical Care (six items), Care Pedagogics (five items), Documentation and Administration of Nursing Care (eight items), and Development Leadership and Organization of Nursing Care (six items). Responses are given using a four-point Likert scale with the following alternatives to allow participants to express how much they agree or disagree with each statement: 1 – to a very low degree, 2 – to a relatively low degree, 3 – to a relatively high degree, 4 – to a very high degree. Following the NPC-SF user manual, the responses for each of the six competence areas were converted into a score between 1 and 100, where 100 indicated the highest possible self-reported

competence (Nilsson et al., 2018; Nilsson et al., 2019). The NPC Research Group agreed to use this questionnaire for this study and the English version of the NPC-SF can be found in Appendix E.

Semi-structured interviews

The interview guide is conducted by the fact that this study is an initial evaluation and thus aims to generate as broad a collection of information as possible. The two questionnaire (supervisors and [former] NP-students) consists of ten open-ended questions and allows the author to ask more in-depth questions. Furthermore, the questionnaire also asks questions about the content of the curriculum as well as demographic information about the participants (age, profession, work experience, etc.). The questionnaire was discussed and verified with the author's work colleagues (professors in nursing science and research assistants) at the BUAS. The questionnaires and the questions about demographics can be found in Appendix F and G.

Timeline and critical milestones

Task	Mar 2022	April 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sept 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023
Appointment Prof. Mittal			**X**												
Finishing Proposal	**X**	**X**	**X**												
Submit IRB at UNCG			**X**												
Contacting supervisors for interviews				**X**	**X**										
Contacting NPs for interviews				**X**	**X**										
Conduct interviews with supervisors and interviews with NPs					**X**	**X**	**X**								
Send/deliver questionnaire to supervisors and NPs					**X**	**X**	**X**								
Task	**Mar 2022**	**April 2022**	**May 2022**	**Jun 2022**	**Jul 2022**	**Aug 2022**	**Sept 2022**	**Oct 2022**	**Nov 2022**	**Dec 2022**	**Jan 2023**	**Feb 2023**	**Mar 2023**	**Apr 2023**	**May 2023**

Safety time							**X**	**X**							
Transcribe and evaluate interviews								**X**	**X**	**X**					
Evaluate questionnaire								**X**	**X**	**X**					
Appointment Prof. Mittal								**X**	**X**						
Write report										**X**	**X**	**X**	**X**		
DNP Graduation															**X**

Budget

Table 3: Description of costs

Cost items	Costs in Swiss Francs (CHF)
Infrastructure audio recordings	200
Round-trip travel to interview participants (20)	1000
Transcription interviews	Costs are covered by BUAS
BUAS drinking bottle and note-writing book as a gift for the interview participants (supervisors) and a voucher of a major Swiss retailer of 20 CHF	Costs are covered by BUAS 200 for vouchers
Miscellaneous	500

IRB Approval

This study does not present any specific ethical concerns but must be approved by the IRB of the University of North Carolina at Greensboro. Before the interviews are conducted, participants are informed verbally and in writing about the aim, benefits, and risks of the study, and written informed consent was obtained. The interviews are recorded on tape recorder, subsequently transcribed verbatim, anonymized, and deleted after completion of transcription. The digital survey starts from a neutral and anonymized questionnaire, the answers are coded and kept in a separate place for 10 years.

Since this study involves the collection of anonymized health-related data, the study does not fall under the Swiss Human Research Act (Fedlex, n.d.) and therefore does not require the consent of the ethics committee of the relevant canton.

Procedure and Data Collection

Semi-structured interviews

Interviews are conducted first with supervisors and then with (former) NP-students from August until November 2022. The interviews are designed to provide an in-depth look at the experience of this clinical education and to reflect the experiences, attitudes, needs, and opinions of the participants (Brinkmann & Kvale, 2015). The interviews will address the understanding and experience of clinical education, examples from the curriculum, collaborative arrangements, supervision and autonomy, and desires and needs for future

education and collaboration. Interviews will be conducted at an agreed upon time and place or online and will be tape recorded with the consent of the participants. To avoid the greatest possible distortion of the interviews, the audio files are forwarded to an external expert for transcription immediately after recording.

Questionnaires

The (former) NP-students are informed about the study by the author via personal mail. Subsequently, BUAS sends the online questionnaires in bcc to the participants and the paper questionnaires by post. The NPC-SF and APNCAI will be distributed to the (former) NP-students in July 2022. They will have time until mid/end of September 2022 to complete the questionnaires, both the author and BUAS will send regular reminder emails.

Data Analysis

Questionnaires

Statistical analyses will be conducted using Microsoft's Excel for Windows to analyze data from the NPC-SF and the APNCAI. For the NPC-SF a sum score for all eight competence areas will be calculated and transformed into 0 to 7 scales. A higher score indicates better self-assessed competence. Descriptive analysis will be performed for frequencies of the answers/characteristics of the answers for a first starting position.

Also, for the APNCAI a sum score for all eight competence areas will be calculated and transformed into 0 to 5 scales. A higher score indicates better self-assessed use of the behavior. Descriptive analysis will be performed for frequencies of the answers/characteristics of the answers for a first starting position.

Semi-structured interviews

This part includes a descriptive, qualitative analysis of the interviews, applying content from theme and content analysis (Polit & Beck, 2021). Data will be analyzed using inductive and deductive approach. The analysis of socio-demographic data was done in Microsoft's Excel

for Windows. Transcripts from interviews and field notes from the author will be managed with Maxqda, Version 2022. There will be three points of data analysis:

1) Particularities of each interview will be described in a descriptive narrative
2) Thematic analysis (Clarke et al., 2015) will be used to identify recurring themes, events, and patterns in observational and interview data (Creswell & Poth, 2017). This first step in analyzing qualitative data is an inductive approach in which newly discovered themes are categorized. The second step, a deductive approach is used by repeatedly reading through the raw data and specifically looking for statements or observations that relate to the dimensions determined by the existing theoretical models outlined earlier (NTF, 2016). Related themes are then extracted and assigned accordingly (Holloway & Galvin, 2016). In a third step, quantifiable variables such as the number of supervising hours (total effort in hours), financial compensation, and the number of patient examinations/number of patient consultations analyzed through counting and tabulation (Clarke et al., 2015).

   This type of data analysis was appropriate for the present study because the research question did not focus exclusively on personal experience and its meaning but had a practical and applied interest (Braun & Clarke, 2021). The focus was on elaborating cross-case themes rather than the specific characteristics of an individual case.
3) Content Analysis (Mayring, 2022).
   a) Subject, research question, theoretical background
   b) Theory-based definition of categories (nominal or ordinal)
   c) Theory-guided formulation of definitions, anchor examples and coding rules for each category, compilation into a coding guide
   d) Coding of a first part of the text; revision of the categories and the coding guide
   e) Final passage of material; assignment of categories to test passages

f) Intercoder agreement test

g) Evaluation, possibly quantitative analyses (e.g., frequencies)

Results

Quantitative part

Quantitative results NPC-SF

The use of the NPC-SF questionnaire was primarily chosen so that (former) students could assess their own basic (clinical) skills in everyday nursing practice. Since this was the first time the NPC-SF was used in this setting and it was not a matter of translation or validation here, descriptive frequency analyses were used to obtain an initial baseline for this (Elmore et al., 2020). This was done with the goal of using the questionnaire with all (former) NP-students after the clinical modules to better assess and evaluate the courses. The results of the frequency analyses are shown in Appendix I.

The NPC-SF was mailed in hard copy to 29 (former) NP-students with a stamped reply envelope (n = 29). In August/September 2022, 17 questionnaires were returned, of which all were evaluable (58.6%). All 17 questionnaires were completed by female (former) NP-students with an average age of 29 years (ages range from 26 to 48; Median 30) and an average work experience of seven years (range from 0 to 24; Median 7). All had completed a bachelor's degree in nursing science prior to the MScN and were now working in either general practitioner settings (35.2%), long-term care (5.8%), or acute care hospitals (58.8%). For details, see Table 4.

Table 4: Demographics NPC-SF-Questionnaire

Participant (Sample)	29	
Population	17	58.60%
Characteristic		
Ethnicity		
Swiss	17	100%
Gender		
Male	0	0
Female	17	100%
Age (yrs)		

20-30	10	58.80%
31-40	5	29.40%
41-50	2	11.80%
Marital Status		
single	13	76.50%
married	4	23.50%
Education before MScN		
BScN	17	100%
Years of work experience before starting MSc		
0 - 5	7	41.20%
6 - 10	6	35.30%
11 - 20	3	17.70%
21 - 30	1	5.80%
Place of clinical education		
Family Practice	8	47.10%
Acute Care Hospital	9	52.90%
Current Workplace		
Family Practice	6	35.30%
Acute Care Hospital	10	58.80%
Long-term care	1	5.80%

The total mean score of clinical competence at this baseline (NPC-SF) was 2.86 (SD 0.96, range: 0.86-3.71). The eight items with the highest score at baseline are presented in Table 5.

Table 5: Top 8 items NPC-SF

Item	Item: Do you think you have the ability to…	Baseline Mean (SD)
3	cater for the patient's needs regarding specific, physical nursing care?	3.43 (5.86)
10	utilise the knowledge and experience of the team and others, and through team collaboration contribute to a holistic view of the patient?	3.43 (5.19)
11	manage drugs adequately, applying knowledge in pharmacology?	3.43 (3.36)
17	provide support and guidance to enable optimal participation in care and treatment, in dialogue with the patient and next of kin?	3.71 (5.71)
23	use information and communication technology (ICT) to support nursing care?	3.57 (4.61)
25	comply with existing regulations as well as guidelines and procedures?	3.29 (4.61)
30	act adequately in case of unprofessional conduct by staff?	3.43 (3.74)
32	implement new knowledge and thus promote nursing care in accordance with science and evidence-based practice?	3.43 (3.41)

Quantitative results APNCAI

The use of the APNCAI questionnaire was primarily chosen so that (former) NP-students could assess their own (clinical) skills in their advanced roles as a NP. Since this was the first time the APNCAI was used in this setting and it was not a matter of translation or validation here, descriptive frequency analyses were used to obtain an initial baseline for this.

This was done with the goal of using the questionnaire with all (former) NP-students after the clinical modules to better assess and evaluate the courses. The results of the frequency analyses are shown in Appendix H.

The APNCAI questionnaire was emailed through Redcap® to 29 (former) NP-students by the administration team of the BUAS. The email included an information about the study and its purpose and an informed consent and contact information for questions. After five weeks the administration team sent a reminder to fill out the questionnaire. By end of September 2022, 17 questionnaires had been returned (58.60%). Of these, two questionnaires had not been completely processed (less than one third) and were therefore excluded. Thus, 15 questionnaires could be analyzed. All these 15 questionnaires were completed by female (former) NP-students with an average age of 31.33 years (ages range from 26 to 48; Median 30) and an average work experience of 8.26 years (range from 1 to 15; Median 7). All had completed a bachelor's degree in nursing science prior to the MScN and were now working in either general practitioner setting (60.00%), long-term care (6.66%), or acute care hospitals (53.33%) (Details Table 6).

Table 6: Demographics APNCAI-Questionnaire

Participant	29	
returned and used	15	51.72%
Characteristics		
Ethnicity		
Swiss	15	100%
Gender		
Male	0	
Female	15	100%
Age (yrs)		
20-30	8	53.33%
31-40	6	40.00%
41-50	1	6.66%
Marital Status		
single	7	46.66%
married	3	20.00%
partnership	5	33.33%
Education before MScN		
BScN	15	100%
Years of work experience before starting MScN		
0 - 5	4	26.66%
6 - 10	7	46.66%
11 - 20	4	26.66%
Place of clinical education		

Family Practice	9	60.00%
Acute Care Hospital	6	40.00%
Current Workplace		
Family Practice	6	40.00%
Acute Care Hospital	8	53.33%
Long-term care	1	6.66%

The total mean score of clinical competence at this baseline (APNCAI) was 2.83 (SD 0.64; range: 1.60-3.80). The eight items with the smallest SD at baseline are presented in Table 7.

Table 7: Top 8 Items APNCAI

Item		**Domaine**	**Baseline Mean (SD)**
1.6	Implements evidence-based algorithms, clinical guides, protocols, and paths of action for the population.	Research and Evidence Based Practice	2.83 (1.94)
2.1	Assumes complex, advanced leadership positions with the purpose of initiating and channeling the evolution of work.	Clinical and Professional Leadership	2.83 (1.94)
3.2	Diagnoses complex, unstable health problems by collaborating and consulting with the multidisciplinary health care team, as indicated by the context, the specialty and individual knowledge and experience.	Professional Autonomy	2.83 (1.33)
4.6	Tutors' health workers, university students and others in acquiring new knowledge and skills to help them in their professional practice.	Interprofessional Relations and Mentoring	2.83 (1.72)
5.4	Assesses other nurses, him/herself and the system through quality control and management as part of a programme of continuous quality improvement.	Qualitymanagement	2.83 (2.32)
6.1	Organizes the components of the care plan and coordinates health care.	Caremanagement	2.83 (1.17)
7.2	Promotes and advocates programmes that support the interdisciplinary education of health care.	Professional Teaching and Education	2.83 (2.14)
8.3	Promotes self-care in teenagers and adults within the family and/or support systems and facilitates their participation in health care whenever appropriate.	Health Promotion	2.83 (1.72)

Qualitative part

Interview supervisors

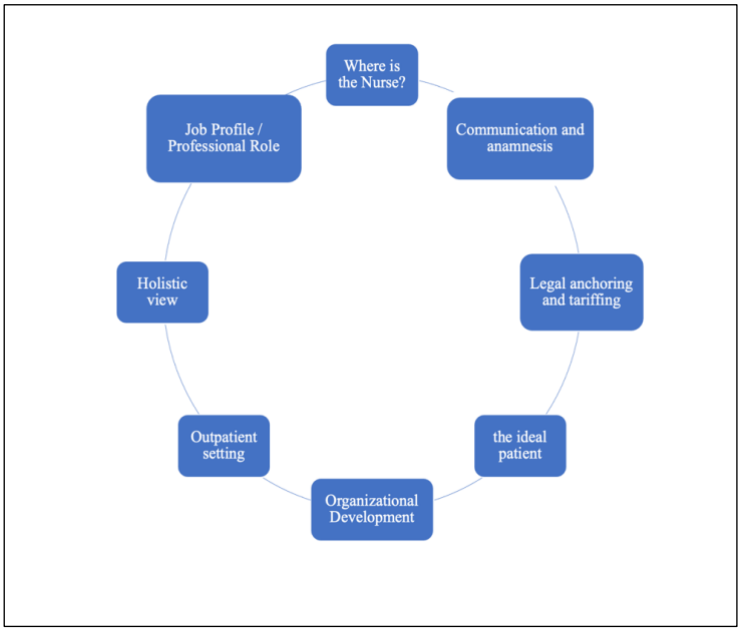
Ten supervisors were interviewed during the period from August to October 2022. Five interviews were conducted online via MS Teams, one by telephone, and four on-site with the respective supervisors. Interviews lasted an average of 21.5 minutes (minimum 18.18; maximum 33.27). Seven supervisors worked as general practitioners or primary care physicians in independent practices, and three supervisors worked in acute care hospitals, including internal medicine and emergency departments. All of them it was the first time that they worked with a prospective NP or that they supervised students from this study program. The demographics of the supervisors are shown in Table 8.

Since the training as well as the role was new for all supervisors except the two people with MScN training, they were all very grateful for the exchange. Besides the actual interviews, many questions could be discussed as well as clarifications in the training system of the health care system could be made. The answers of the supervisors can be considered as very homogeneous. Data saturation was reached after the seventh interview. Table 8 shows the schematic representation of the results of the topic and content analyses. Quoted statements of the results are in Appendix J.

Table 8: Demographics Supervisors

Characteristics	N = 10
Ethnicity	
German	1
Italien	1
Swiss	8
Gender	
Male	6
Female	4
Age (yrs)	
30-40	2
41-50	1
51-60	6
>60	1
Education	
MScN	2
General Internal Medicine	3
General Internal Medicine plus other	4
other	1
Number of years of work experience after graduation	
0 - 5	2
6 - 10	2
11 - 20	1
21 - 30	3
>30	3
Institution	
Family Practice	7
Acute Care Hospital	3

Table 9: Results of the interview analyses of the supervisors



Job profile / Professional Role

The most pronounced answers were provided by the question about the knowledge of the competence profile of the students. To this, all physicians answered that it was not clear to them what the students were capable of, what they had to learn during the internship, and

what the final competencies should be. Often, physicians compared students to medical students. Since most supervisors did not really know the professional field or role, they considered this opportunity to supervise students in a relatively noncommittal manner and establish initial points of contact a great opportunity. Most of them then also expressed that they would see the nurse practitioner primarily in outpatient care and thus would also have a place in the entire health care system.

A big question was the issue of selection criteria. It was not clear to most supervisors that a bachelor's degree in nursing is the basic entrance qualification, BUAS also requires two years of professional experience. The supervisors expressed the opinion that the professional experience is a so-called "sine qua non" and rather imagine even more professional experience. This is also against the background that BUAS is discussing the abolition of professional experience as a requirement. In this discussion, the desire for the participation of supervisors in the entrance examinations was repeatedly expressed, to get to know the students at an early stage and to assess whether they would fit into the corresponding team. However, no one was able to provide more precise information on what this process would look like. For all supervisors, it was important to emphasize that future NPs know their limits and thus do not just do anything but consult with the person with final responsibility as part of the medical delegation.

Holistic view

Another issue that many supervisors addressed and considered a success factor is the holistic view of prospective NPs. This was said to be very pronounced, in some cases almost too fixed and too detailed. This could almost be a hindrance in the outpatient setting, where a highly synchronized rhythm of consultations is planned. In this context, the communication skills of the students were often mentioned, that it was noticeable here that they were trained in this and were also used to dealing with patients.

Outpatient setting

Supervisors expressed several times that the lack of experience in the outpatient setting had been noticeable. Practically all students come from the acute hospital or long-term care sector and topics from the outpatient sector have hardly been trained in the university up to now. This was reflected in the fact that the students were often unfamiliar with the outpatient billing system or the outpatient legislation, that they were not used to the consultation rhythm, and that they did not know the tasks and competencies of the various people with different still-grade mixes.

Organizational Development

In three out of ten practice institutes, students were integrated into a team in which a concept for the training content was in place. These were three practices that were active in primary care and had already employed NPs. In all other institutions, the "hiring" of students was based on individual motivation and activity of individuals (these individuals often had first points of contact during work stays in the USA, England, or Scandinavia). These individuals often had no idea at the beginning what the students were capable of, needed to learn during the field placement, and if final competencies were defined. It was also not clear who supervised the students in their daily work and what their responsibilities were.

Supervisors described this as a "balancing act" between frustration and pioneering, but always saw the benefit of NPs primarily in primary care. They also expressed that they had received little support from the top management department. Yet, they said, it was essential that organizations form in a way that allowed for the development of such NP roles or NP tasks. It is important that a certain "organizational readiness" is created or exists when such projects are worked on (acceptance, skill level, dealing with delegation and the legal framework, etc.). Not least also as an attraction in the fight for skilled workers.

The ideal patient

The question of the "ideal patient" came up in all the interviews. Supervisors see future NPs primarily in primary care, where there is already a shortage of family physicians and pediatricians. They see further fields of work in long-term care, since the level of training has also fallen here (many untrained nursing assistants), and in home care around interface management. Some supervisors also mentioned a triage function in the emergency departments, which are increasingly overloaded with so-called minor cases due to the shortage of general practitioners.

In primary care, supervisors described the "ideal patients" with chronic conditions requiring high levels of consultation and education, preventive and screening issues, and initial histories and various assessments.

Legal anchoring and tariffing

All supervisors kept coming back to the legal framework. The fact that the master's level in nursing is not regulated and accordingly it is not clear what the students have to learn leads to great uncertainty, resistance to the role, additional work, and skepticism towards the educational institution. Supervisors expressed that they are always with "half a leg in prison". Also, the related fact that NP activities cannot be mapped or accounted for in the current system, nor does nursing have its own pay scale, makes institutions reluctant to invest in NP roles.

The financial compensation of clinical training by the Canton of Bern (only practice partners in the Canton of Bern) was controversially discussed. On the one hand, financial compensation was not the main motivation (in some cases they did not even know about it), on the other hand, practice partners outside the canton of Bern would like to have compensation.

Communication and anamnesis

In terms of learning content, the picture was very homogeneous. The supervisors expect the future NPs to have pronounced social competencies with professional communication skills. They want to see that the NP can engage with the patient without reservation and can make initial observations regarding complaints or problems in conversation. It is important to the supervisors that the NPs can communicate in an addressee-appropriate manner, also in the interprofessional team.

The supervisors place a second emphasis on structured anamnesis. In this context, the supervisors expect a structured, systematic procedure, which also includes differential diagnostic considerations. Especially in the outpatient setting, it was important to the supervisors that anamnesis be carried out efficiently based on the leading symptoms. They expressed that they sometimes had the impression that the theoretical background or the content of the lessons was too deep and too detailed (and more like studying human medicine), but that examination techniques and communication skills were not trained enough.

Where is the Nurse?

For the two NPs who were supervisors, the question often arose during the 50 days as to where the "nurse part" was. The 50 days are primarily clinically focused, but in their future roles as NP, that is only one component. The physician supervisors asked themselves the same question, saying that they treated the students like human medicine students and don't really see what exactly an NP does differently now than a physician. At the same time, however, they also described fields of work and activities that were clearly dominated by nursing (case management, consultations, etc.). All interviewees agreed that it is essential for role development to describe the "nurse parts" more precisely and to integrate these into the 50 internship days.

Interviews students

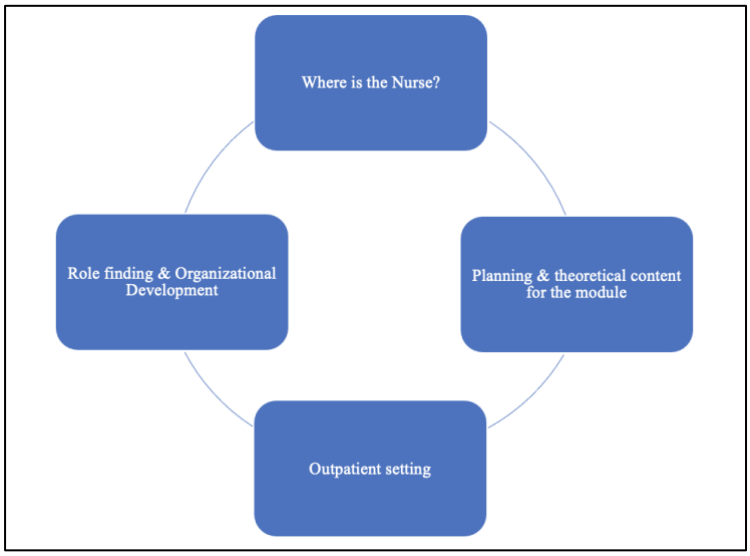
Ten (former) NP-students were interviewed during the period from August to September 2022. Four interviews were conducted online via MS Teams and six on-site with the respective students. Interviews lasted an average of 29.4 minutes (minimum 24.27; maximum 41.39). Six (former) NP-students worked as registered nurse or as a NP in acute care hospital and four students worked in as a NP in a family practice setting. The demographics of these people are shown in Table 10.

The (former) NP-students were very open to the interviews, and it was important to them to present their open and transparent opinions. The answers of the (former) NP-students can be considered as very homogeneous. Data saturation was reached after the eighth interview. Table 11 shows the schematic representation of the results of the topic and content analyses. Quoted statements of the results are in Appendix K.

Table 10: Demographics students

Characteristics	N=10		
Ethnicity		**Number of years of work experience before starting MScN**	N =10
German	1	0 - 5	5
Swiss	9	6 - 10	3
Gender		11 - 20	1
Male	0	>20	1
Female	10	**Current Workplace**	
Age (yrs)		Family Practice	4
20-30	5	Acute Care Hospital	6
31-40	3	**Institution during MScN**	
>40	2	Family Practice	7
Education		Acute Care Hospital	1
BScN	10	Emergency Department	2

Table 11: Results of the interview analyses (former) NP-students



Role finding & Organizational Development

For almost all (former) NP-students, the clinical modules or clinical teaching were decisive for their choice of study. They all have in common that they explicitly seek direct patient contact and want to work less conceptually. Some of the students were the first to take this specialization and therefore the practice partners had no experience with it. They described their embedding in their respective organizations as "getting to know each other and working based on trust." For all (former) NP-students, clarification of competencies represents an essential condition for the profession to be successfully implemented as such in the health care system. The supervisors had often heard something about ANP, would have had points of contact in other countries or were ANPs themselves, but the learning objectives or competencies were still not clear, and the contents of the study were not well communicated according to their statements.

Outpatient Setting

Most (former) NP-students worked in the inpatient hospital setting. For the internship as part of their studies, many met the organizational structure in the outpatient setting or with

a family practice setting for the first time. This "consulting hour rhythm" turned out to be very challenging for many, as they were not used to working through their activities within a given time. To make matters worse, almost all the students expressed a major lack of knowledge about the outpatient structure in healthcare, such as cost recovery, billing, documentation, etc. Another challenge in the outpatient setting was the unfamiliar roles for (former) NP-students, such as medical office assistant or practice coordinator. Here it was often not clear who does what and who has which competencies and responsibilities. Despite the difficulties, virtually all students recognized the potential for NPs in the outpatient setting.

Planning and theoretical content for the module

In general, (former) NP-students were satisfied with the planning and content of the clinical modules and even found them very exciting. The approach of 50 days or 400 hours was appropriate for most, but certainly not too little. They wished for more practical training in the theory lessons so that they could better benefit from the practical assignments. Furthermore, the (former) NP-students expressed that the teaching of clinical content was very broad and in-depth, so that the practical approach, which is particularly important for primary care, was sometimes neglected. Another topic was the documentation provided by BUAS. The purpose of the logbook was not clear to most and the formatting was not user friendly. In addition, the logbook in this form is not suitable to be a part of the proof of competence. Similarly, (former) NP-students criticized the "intervision day" (the final day of the module in which a case is presented but not graded) as unstructured and without precise objectives.

Where is the Nurse?

As the supervisors had already pointed out, it was not clear in the practicum where the exact "nursing-specific" topics should be. The specifications in the module are clearly medical-clinical oriented, nevertheless for many (former) NP-students the nursing parts were

missing (both in the direct internship and in the teaching sequences). The absence of these parts meant that they struggled to define and argue their exact role and their actual "raison d'être". They also lacked the issues of leadership and communication in the clinical setting to implement the concept of ANP. Some (former) NP-students succeeded in generating certain specific patient settings for themselves during the practice assignments, for example, performing the standard checks (vital signs, physical examination, mental state, adherence issues, social support, etc.) on recurrent, chronically ill people. Other activities were also the initial triage, anamnesis according to leading symptoms or preventive examinations. In this context, all (former) NP-students emphasized the importance of several years of professional nursing experience, from which they benefited greatly.

Discussion

The aim of this DNP project work was to evaluate the clinical education of students in the master's degree program in nursing with the specialization NP of BUAS, to examine the content and the number of hours of clinical education and to derive recommendations or interventions for a standardized educational performance for the attention of teaching, management, and politics in the German-speaking part of Switzerland.

Both (former) NP-students and supervisors were very open and happy to be interviewed. Here it could be stated that the developments in this study specialization proceeded very fast, but probably the communication and personal contact with the supervisors was neglected. The need to talk was correspondingly great, since very much about this "NP construct" is unclear and the supervisors also had many fundamental questions in relation to the nursing educational landscape.

The results show that the NP specialization with the appropriate clinical orientation is an attractive and meaningful course of study for both supervisors and students. Both see the need as well as opportunities for employment in this new role. These statements are largely

consistent with the descriptions of Taylor et al. (2021) and Chau et al. (2022). As was the case for Gardenier et al. (2021), physician supervisors were also clear that they were part of this training because the clinical hours were heavily medicalized.

The results of the questionnaires show that nurses with a master's education or already during their master's education observe and evaluate clinical patient situations in a differentiated and meaningful way and subsequently make careful decisions (also based on their professional experience). In doing so, they focus on the patient and his/her family/relatives and try to implement the nursing process holistically. They are aware of their role model function and can also communicate and work appropriately interprofessional due to their extended professional knowledge. These statements fit the requirements to the "Advanced Level Practicum" described by the AACN (2021) and the measurements with the two questionnaires represent a solid starting point on which regular, renewed measurements can be built.

The interviews revealed a clear tendency toward competency clarification and organizational development. For both (former) NP-students and supervisors, clinical content was secondary, as neither group knew exactly what to teach or learn and what competencies to ultimately equip them with. In this regard, even the relevant BUAS documents were of little help. The currently scheduled 400 hours of clinical teaching was adequate for most (certainly not too much), however, they also anticipated that this number would likely need to be set higher in the future. However, (former) NP-students indicated that the 400 hours was simply an initial foundation and that the actual clinical training or clinical specialization would then come with an appropriate NP role. Similarly, they saw no benefit in a rotation system during these 50 days because of the time required for familiarization and the need to establish trust with the supervisor. All these statements are consistent with the results from the

Ljungbeck et al. (2020) study and are also consistent with the content of the AACN (2021) regarding “Advanced Education Clinical/Practice Hours”.

Many supervisors had no idea what an NP could do and how it could be embedded in the organization. Here, the wish then also arose that BUAS could also be supportive in the corresponding organizational development (job description, salary classification, still-grade mix, etc.) so that a certain "organizations readiness" is also achieved. In this context, it must be mentioned that the (former) NP-students criticized the absence of the modules "Leadership and Change Management" and "Communication". These modules were deleted during the elaboration of the specialization in favor of the extended clinical modules. However, this conceptualization does not correspond to Hamric's model and is, however, considered by many involved persons as an important part in the daily life of NPs (Tracy & O’Grady, 2018).

(Former) NP-students frequently commented that theory instruction was very detailed and broad, but practical content was often lacking. They also would have liked trained NPs to teach more theory classes. In this context, they also felt that there was a lack of exchange and exchange of ideas. For supervisors, the lack of legal regulation also presented a greater challenge than actual on-site clinical teaching. They complained that they trained (many) people who they could not adequately use afterwards, since the financial settlement was not regulated either.

As also described by Taylor et al. (2019) and Gardner et al. (2020), another important issue was the topic of actual nursing content during clinical training. Clinical training at BUAS is primarily based on the medical-clinical criteria with the aim that students can perform a structured somatic and psychological examination, evaluate leading symptoms and document them in a correspondingly standardized manner. Both interview groups expressed that they lacked the "nurse" components in these clinical days and thus could not perceive the purpose of an NP in such a structure. Both sides described possible fields of application in

counseling, coaching, instruction as well as accompaniment of chronically ill persons, polymorbid patients or in old people's and nursing homes (Sottas & Kissmann, 2022). In this context, both supervisors and students see one of the larger areas of work for NPs in outpatient care. The shortage of primary care physicians and the increasing number of outpatient indications in hospitals present great challenges to the outpatient care institutions. Here and in general practitioner settings (adults and children), participants see the greatest potential for NPs. However, for this to happen, clinical teaching must be geared more to the breadth of the various clinical syndromes, and NPs need knowledge of the outpatient system in Switzerland. Here, both interview groups identified a great need to catch up, as well as on the financial framework conditions (service recipients versus service providers) and digitalization in the Swiss healthcare system (Sottas et al., 2019). These are also requirements that a NP must bring according to AACN (2021) (Systems-based Practice and Informatics and Technology).

BUAS has been discussing internally for some time the removal of the two years of work experience as an admission requirement, to be on par with other master's programs. Regarding the NP specialization, all interview participants consider it essential that NP-students have a certain amount of professional experience. The supervisors want to be able to rely on the fact that they are not dealing with a "nursing novice", certain communication and teamwork skills as well as empathy are needed. Likewise, students expressed that they could hardly have managed the study without some years of work experience. In addition, professional experience is also needed to meet the activities of an NP at all. These statements are consistent with Benner's theoretical construct (2017) and with AACN's (2021) described "Engagement and Experience" requirements.

All DNP project work has its limitations, and this project was no exception. The strengths came primarily from the rich and detailed interview data, which provided initial and

broad insight into supervisors' and (former) NP-students' views and opinions on the topic of clinical education. It became apparent that the actual clinical education was not the (main) problem, but the non-existing regulation, the unclear final competencies, and the challenge of the respective organizational development. The use of interviews contributed to the validity of the data as the deeper meaning was explored to reach an initial understanding. One of the biggest limitations of this project work was that the sample was too small in the quantitative portion to really provide meaningful answers. The questionnaires simply provided an initial baseline and clues, but certainly nothing more. In both questionnaires 17 students answered, here the question arises whether the final participants were the same in both cases and whether there could be a possible bias in the results. Another limitation is certainly that the interviewees' statements were very broad and specific to the BUAS setting. Thus, transferability to other universities is limited. It should also be remembered that the lead author conducted the interviews alone and thus there is certainly some bias.

Conclusion

This work contributes to a better understanding of the current situation around clinical education of NPs as well as their supervisors in practice. The results show that improvements or adjustments and clarifications are needed on different levels. It is undisputed that more qualitative and quantitative research is needed regarding clinical education and graduation competencies.

Recommendations for teaching

BUAS will have to work on the topics of outpatient-setting as well as definition of final competencies and integrate these into the corresponding documents (for example, logbook). Furthermore, it would be ideal if BUAS would also work out concrete proposals and concepts for the hand of the respective organizations regarding organizational development and the embedding/tasks of the NPs (assistance). In addition to written documents, personal contact

with the practice partners is also essential. Here, a regular personal exchange on site is recommended. And BUAS needs to discuss internally whether clinical hours should really remain purely clinical or whether it also wants to add some "nurse" components to these training hours. Either way, the meaning and content of clinical training must be better communicated to students. Similarly, the discussion of required work experience for degree admission must be carefully managed with consideration of the available resumes.

Recommendations for Management

The benefits of NPs and the positive impact of NPs on patient outcomes are undisputed. The supervisors and the students can clearly name which patient groups should ideally be served by NPs. Here, it is now up to the management to work out such offers together with the NPs. At the same time, the NPs can then in turn act as practice partners and thus train their own junior staff. This ultimately serves the cantonal training ordinance (Canton of Berne) and can also be a lever in the context of the shortage of skilled workers. However, when developing possible offers, it is essential that the management also has a certain expertise regarding ANP and that the top management level recognizes these roles and functions and that there is a genuine interest in implementing and adapting the skill-grade mix. The expansion of educational offerings in direct clinical practice should be promoted to meet the challenges of the burdened health care system face.

Recommendations for Politics

All respondents advocated the recognition of the master's degree and its inclusion in the GesBG, which would also regulate the degree competencies. This measure would also meet with broad acceptance among all stakeholders. This regulation would defuse the problem for the time being, especially regarding the question of what the supervisors are training all the NPs for. To expedite this regulation and implement it in the best interests of

service providers, universities, and employers, policymakers would need to initiate interprofessional project groups on the topic.

Dissemination plan

The present results will be prepared and published for an appropriate journal. This publication will then also be sent to all interview participants. Further publications with other questions from the interviews will certainly follow. The involved university will receive a separate presentation of the results in the context of an interdisciplinary training. Furthermore, the results will flow into the revision of the modules as well as into the cooperation with the supervisors. Due to the appreciative individual feedback from the interview partners, they will receive a separate thank-you email including initial results from the project after graduation.

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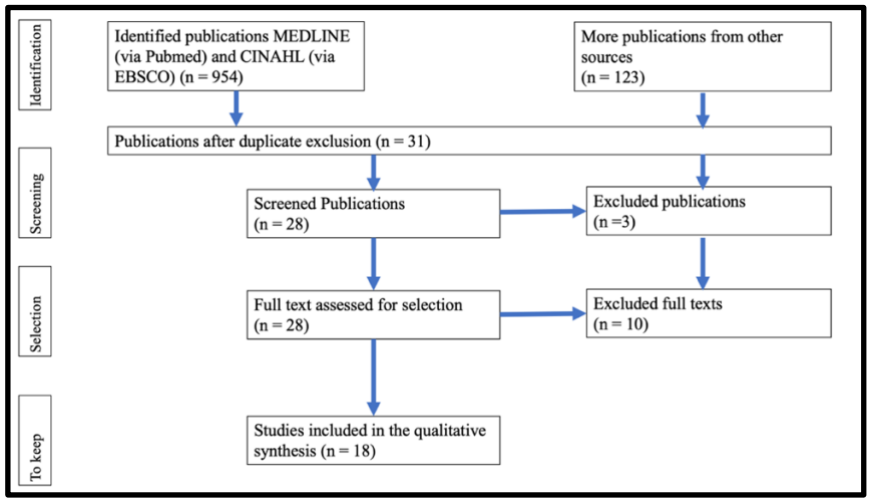
Appendix A: PICOT-Question

P	I	C	O	T
Population = Practice partners & NP students & Bern University of Applied Sciences Health.	Intervention = Yes = NP students with 400 hours of clinical training.	Control = No = Feasibility	Outcome = Clarity in clinical education requirements, transparent competencies, satisfaction of practice partners (host recurrent students), arguments for (appropriate) compensation of practice partners	Summer 2023

Appendix B: Search Strategy and PRISMA Flow Diagram of the literature search strategy

Search Terms	Inclusion criteria	Exclusion criteria
- Klinische Ausbildung Nurse Practitioner (German) - Clinical education AND Nurse Practitioner - Clinical education AND Nurse Practitioner Students (MeSH Terms) - Clinical education of Nurse Practitioner Students - Clinical training AND Nurse Practitioner Students (MeSH Terms) - Clinical competencies AND Nurse Practitioner (MeSH Terms) - Clinical hours requirement AND Nurse Practitioner - Preceptor expectations AND Nurse Practitioner Students (MeSH Terms) - Quality of Care AND Nurse Practitioner	- 1 year - 5 years - Clinical Trial - Meta-Analysis - Randomized controlled trial - Review - Systematic Review - Adult setting - Primary care provider or general practitioner	- Books and documents - Literature older than five years - Specific setting, for example, emergency, orthopedics, or psychiatry - Learning techniques during clinical training - CNS students



Adapted by Moher et al. (2009).

Appendix C: The financing of the Swiss health care system

In 2019, the costs of the healthcare system amounted to 11.3% of the gross domestic product (Federal Statistical Office [FSO], 2021). In addition to the cost drivers already mentioned, the structural framework conditions in Switzerland, some of which have evolved historically, are also responsible. For example, responsibility for healthcare lies with the cantons, which also bear around 50% of inpatient care costs. On the other hand, there is the Health Insurance Act (German: Krankenversicherungsgesetz), in which health policy issues are regulated at the national level. In this context, mandatory basic health insurance represents the most central component (Angerer & Liberatore, 2018). Compulsory health insurance provides benefits in case of illness, accident, and maternity. These include, among other things, examinations, and treatment by doctors in hospital, certain non-medical services, and nursing services. For nursing services to be covered, they must be ordered by a physician, the need for nursing care must have been determined in advance by a licensed nurse, the nursing services must be effective, appropriate, and economical, and they must be provided by licensed service providers.

Appendix D: APNCAI – English version

FACTOR	ITEMS	Never	Almost never	Sometimes	Almost always	Always
1-Research and Evidence Based Practice	1.1 Acts either as a primary researcher or as a collaborator with other health practitioners on the team or in a community context; identifies, leads, or supports research that promotes or benefits health care.					
	1.2 Assesses current clinical practice, on an individual and systemic level based on the latest research findings.					
	1.3 Identifies research priorities in his/her area of professional practice.					
	1.4 Directs the development of evidence-based plans to achieve the needs of individuals, families, the community, and the population.					
	1.5 Uses effective strategies to change professional conduct and teamwork, thereby promoting the adoption of evidence-based practices and innovations in the performance of health care.					
	1.6 Implements evidence-based algorithms, clinical guides, protocols, and paths of action for the population.					
	1.7 Develops and implements mechanisms for regular supervision and assessment of policies that influence health care services and transforms them into health plans, structures and programmes.					
	1.8 Leads the promotion of interdisciplinary collaborations to implement result-oriented patient care programmes that can meet the clinical needs of patients, families, populations and communities.					
2- *Clinical and Professional Leadership*	2.1 Assumes complex, advanced leadership positions with the purpose of initiating and channelling the evolution of work.					
	2.2 Contributes to the advancement of nursing practice through the development and implementation of innovations.					
	2.3 Provides consultancy services based on clinical data, theoretical frameworks and evidence-based practice.					
	2.4 Makes recommendations based on the consultancy process.					
3- *Professional Autonomy*	3.1 Prescribes, orders and/or implements pharmacological and non-pharmacological interventions, treatments and procedures as defined in the health care plans within the appropriate legislative context.					
	3.2 Diagnoses complex, unstable health problems by collaborating and consulting with the multidisciplinary health care team, as indicated by the					

	context, the speciality and individual knowledge and experience.					
	3.3 Provides users with the necessary information regarding the effects and potential adverse effects of the therapies prescribed. Also offers information concerning the costs, as well as alternative treatments and procedures, where necessary.					
	3.4 Obtains data regarding the context and aetiology (including factors that are related and unrelated to the disease) that are necessary to formulate differential diagnoses and care plans, and to identify and assess the results.					
	3.5 Selects, prescribes, and supervise pharmacological and non-pharmacological therapeutic interventions, diagnostic measures, equipment, procedures and treatments aimed at satisfying the needs of patients, families and groups, in accordance with the professional preparation, institutional privileges, local and state laws, and professional regulations.					
	3.6 Diagnoses and manages acute and chronic diseases while addressing the patients' responses to their disease process					
	3.7 Requests, carries out and interprets the results of customary screening and diagnostic tests.					
	3.8 Plans and develops follow-up visits in an appropriate way to monitor patients and assess the health/disease process.					
4- *Inter-professional Relations and Mentoring*	4.1 Finds time to address the professional concerns and requests of his/her colleagues.					
	4.2 Encourages individuals to share which him/her any issue or problem that may affect their personal development and any idea or suggestion related to this, helping them solve their problems in an objective or constructive way.					
	4.3 Collaborates with health care team members to provide inter-professional health care focused on patients, relatives and/or communities s/he works with, at an individual, organizational and systemic level.					
	4.4 Supervises his/her own professional practice while participating in the supervision and review of clinical practice at inter- and intra-disciplinary levels.					
	4.5 Acts as a link (mediating function) between the different professionals involved in the field of health care.					
	4.6 Tutors health workers, university students and others in acquiring new knowledge and skills to help them in their professional practice.					
5- *Quality Management*	5.1 Anticipates the variability of clinical practice and acts proactively in the					

	implementation of interventions that ensure quality.					
	5.2 Designs innovations to bring about changes in clinical practice and improvements in the results of health care.					
	5.3 Uses the results of quality improvement to initiate changes in nursing practice and the health care system.					
	5.4 Assesses other nurses, him/herself and the system through quality control and management as part of a programme of continuous quality improvement.					
6- *Care Management*	6.1 Organises the components of the care plan and coordinates health care.					
	6.2 Keeps up-to-date knowledge of the organization s/he works for as well as the financing of health care systems and the way in which this affect health care activity.					
	6.3 Facilitates continued care and evaluates the status of users when adjusting to their health problems in their own life context.					
	6.4 Supervises the results of health care programmes and advises on clinical management and appropriate interventions.					
	6.5 Contributes to the development of the global health care system and adopts nursing models used in the system to obtain optimal results.					
	6.6 Promotes the ability of the patients, relatives and/or communities s/he works with to participate in decisions related to the care process and managing their health needs, in accordance with the assessment of preferences of the patients, relatives and/or communities s/he works with and the resources available.					
7- *Professional Teaching and Education*	7.1 Assumes responsibility for lifelong learning for his/her own professional development and maintenance of his/her professional competencies.					
	7.2 Promotes and advocates programmes that support the inter-disciplinary education of health care.					
	7.3 Promotes and foments an environment that favours effective learning.					
	7.4 Uses the information obtained in training activities to improve professional performance.					
8- *Health Promotion*	8.1 Participates in the development and implementation of health promotion programmes.					
	8.2 Provides secondary and tertiary prevention to teenagers and adults with multiple or chronic health problems					
	8.3 Promotes self-care in teenagers and adults within the family and/or support systems and facilitates their participation in health care whenever appropriate.					

	8.4 Acts to empower individuals, groups and communities as regards the adoption of healthy lifestyles and self-care.					

Appendix E: NPC-SF – English Version

The Nurse Professional Competence (NPC) Scale©

Short version 35 items in English

The NPC© Research Group 2018-11-04
www.npcresearchgroup.com

Question no	Do you think you have the ability to ….	To a very low degree	To a low degree	To a fairly low degree	Neither high or low degree	To a fairly high degree	To a high degree	To a very high degree
1	independently apply the following stages in the nursing process: observation and assessment (nursing anamnesis, status and nursing goals)?	☐	☐	☐	☐	☐	☐	☐
2	cater for the patient's needs regarding basic, physical nursing care?	☐	☐	☐	☐	☐	☐	☐
3	cater for the patient's needs regarding specific, physical nursing care?	☐	☐	☐	☐	☐	☐	☐
4	document the patient's physical condition?	☐	☐	☐	☐	☐	☐	☐
5	document the patient's psychological condition?	☐	☐	☐	☐	☐	☐	☐
6	communicate with patients, next of kin and staff respectfully, sensitively and empathetically?	☐	☐	☐	☐	☐	☐	☐
7	show concern and respect for the patient's autonomy, integrity and dignity?	☐	☐	☐	☐	☐	☐	☐
8	utilise the knowledge and experience of the patient and/or their next of kin?	☐	☐	☐	☐	☐	☐	☐
9	show openness to and respect for different values and faiths?	☐	☐	☐	☐	☐	☐	☐
10	utilise the knowledge and experience of the team and others, and through team collaboration contribute to a holistic view of the patient?	☐	☐	☐	☐	☐	☐	☐
11	manage drugs adequately, applying knowledge in pharmacology?	☐	☐	☐	☐	☐	☐	☐
12	independently administer prescriptions?	☐	☐	☐	☐	☐	☐	☐
13	question unclear instructions/prescriptions?	☐	☐	☐	☐	☐	☐	☐
14	display judgement, knowledge and thoroughness when informing and providing for the patient's security and wellbeing during examinations and treatments?	☐	☐	☐	☐	☐	☐	☐
15	follow up the patient's condition after examinations and treatments?	☐	☐	☐	☐	☐	☐	☐
16	handle medical products on the basis of existing regulations and safety routines?	☐	☐	☐	☐	☐	☐	☐
17	provide support and guidance to enable optimal participation in care and treatment, in dialogue with the patient and next of kin?	☐	☐	☐	☐	☐	☐	☐
18	inform and educate patients and next of kin individually, taking into account time, form and content?	☐	☐	☐	☐	☐	☐	☐
19	inform and educate patients and next of kin in a group, taking into account time, form and content?	☐	☐	☐	☐	☐	☐	☐
20	make sure that the patient and next of kin understand the information provided?	☐	☐	☐	☐	☐	☐	☐
21	in dialogue motivate the patient to comply with treatments?	☐	☐	☐	☐	☐	☐	☐
22	make use of relevant patient records?	☐	☐	☐	☐	☐	☐	☐
23	use information and communication technology (ICT) to support nursing care?	☐	☐	☐	☐	☐	☐	☐

Question no	Do you think you have the ability to ….	To a very low degree	To a low degree	To a fairly low degree	Neither high or low degree	To a fairly high degree	To a high degree	To a very high degree
24	carry out documentation according to current legislation?	☐	☐	☐	☐	☐	☐	☐
25	comply with existing regulations as well as guidelines and procedures?	☐	☐	☐	☐	☐	☐	☐
26	handle sensitive information correctly and carefully?	☐	☐	☐	☐	☐	☐	☐
27	pay attention to work-related risks and actively prevent these?	☐	☐	☐	☐	☐	☐	☐
28	continuously engage in your own personal and professional competence development?	☐	☐	☐	☐	☐	☐	☐
29	systematically lead, prioritise, delegate and coordinate nursing care within the team, based on the patient's needs and the different competencies of co-workers/staff?	☐	☐	☐	☐	☐	☐	☐
30	act adequately in case of unprofessional conduct by staff?	☐	☐	☐	☐	☐	☐	☐
31	in case of a serious incident within or outside the care institution, apply emergency medical principles?	☐	☐	☐	☐	☐	☐	☐
32	implement new knowledge and thus promote nursing care in accordance with science and evidence-based practice?	☐	☐	☐	☐	☐	☐	☐
33	plan, consult, inform and cooperate with other actors in the chain of care?	☐	☐	☐	☐	☐	☐	☐
34	teach, supervise and assess students?	☐	☐	☐	☐	☐	☐	☐
35	supervise and train co-workers/staff?	☐	☐	☐	☐	☐	☐	☐

Appendix F: Interview Guide and Demographics Supervisors – English Version

Code/Case Number: .....

Date: .....

My name is Karin Ritschard Ugi, I work as a research assistant at the Bern University of Applied Sciences, Department of Health, Master's program in Nursing, and I am conducting this interview as part of my dissertation on the evaluation of Nurse Practitioner clinical education. If you do not understand a question or have any other questions, just let me know at any time. Thank you very much for your willingness to participate in this interview.
The interview will be recorded, anonymized, transcribed promptly afterwards, and archived.

1. you have been a supervisor for clinical Nurse Practitioner training for xxx years - tell me how you experience this?
2. tell me what a typical "supervision day" looks like?
3. which skills do you teach most frequently?
4. do you have sufficient time/capacity to supervise the required 400 hours in 50 days?
5. what competencies do you place particular emphasis on?
6. is the students' prior theoretical training supportive of clinical assessments?
7. what can the students do particularly well, and which skills and abilities still have potential for improvement?
8. Do you work together with fully trained nurse practitioners? If yes, how do you experience this collaboration? If no, why not?
9. how do you experience the cooperation with the Bern University of Applied Sciences?
10. what other challenges do you experience in this context? Or is there anything else you would like to share with me/us?

Case number/code	
Date interview Duration interview (clock)	
Institution	
Gender	
Age	
Nationality	
Marital status	
Education	
Number of years of work experience	
Various	

Appendix G: Interview Guide and demographics (former) NP-students – English Version

Code/Case Number: .....

Date: .....

My name is Karin Ritschard Ugi, I work as a research assistant at the Bern University of Applied Sciences, Department of Health, Master's program in Nursing, and I am conducting this interview as part of my dissertation on the evaluation of Nurse Practitioner clinical education. If you do not understand a question or have any other questions, just let me know at any time.

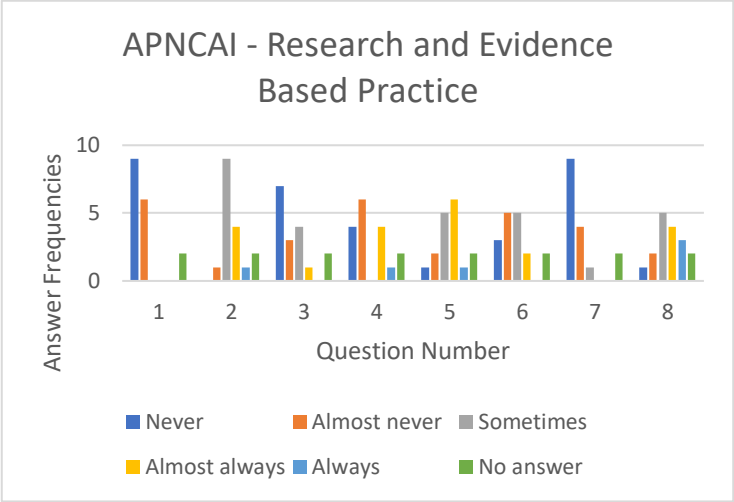
The interview will be recorded, anonymized, transcribed promptly afterwards, and archived.

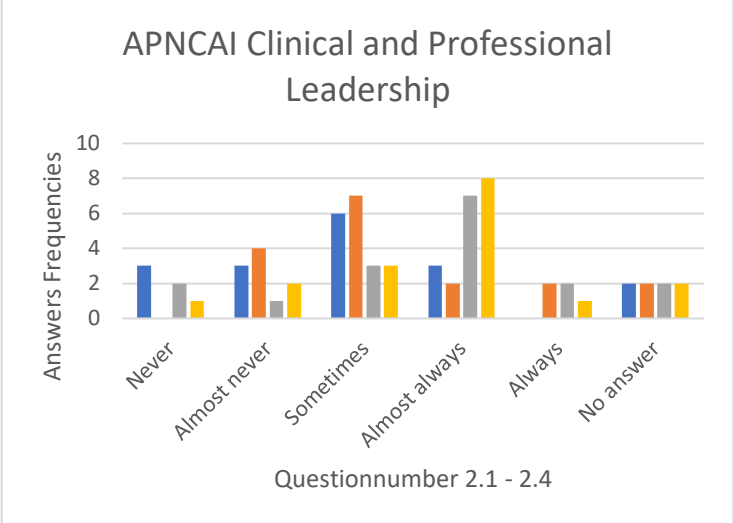
1. you have successfully completed the master's degree program in nursing with specialization Nurse Practitioner - tell me how you experienced this?
2. tell me what a typical "NP everyday life" looked like?
3. which skills were taught most frequently?
4. did you have sufficient time/capacity to complete the required 400 hours in 50 days?
5. which competencies do you use most in everyday life? Did the training provide you with these competencies sufficiently?
6. was the theoretical teaching supportive of the clinical assessments?
7. How do you experience the knowledge of training from your colleagues and your superiors? Have you received the necessary framework conditions?
8. do you work as a NP now? If no, why not? If yes, did you get the skills needed for this during training? If no, why not?
9. how did you experience the cooperation with the Bern University of Applied Sciences in this regard during your training?

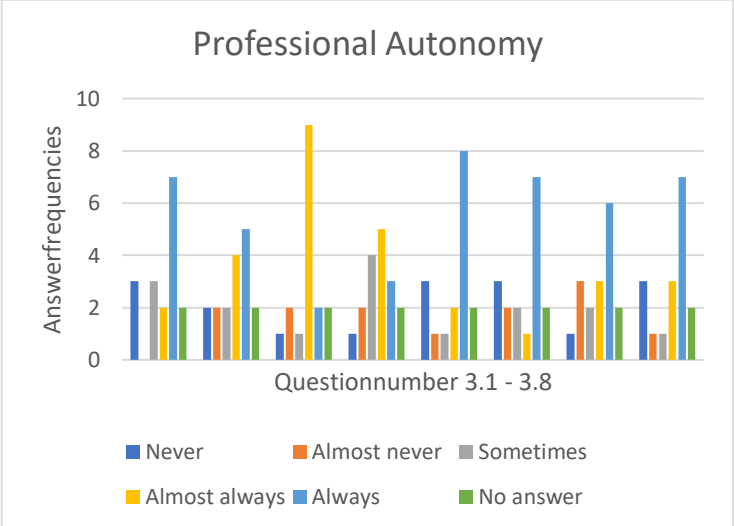
10. what other challenges have there been or are there in this context? Is there anything else you would like to share with me?

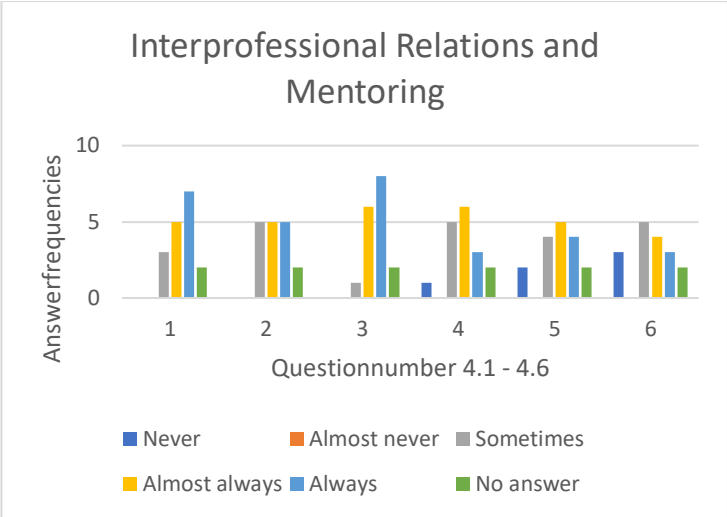
Case number/code	
Interview date 00.00 – 00.00 (clock)	
Institution	
Gender	
Age	
Nationality	
Marital Status	
Education	
Number of years of work experience	
Place of work and function	
Various	

Appendix H: APNCAI Questionnaire and frequency analyses








Interprofessional Relations and Mentoring
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1
2
3
4
5
6
Questionnumber 4.1 - 4.6
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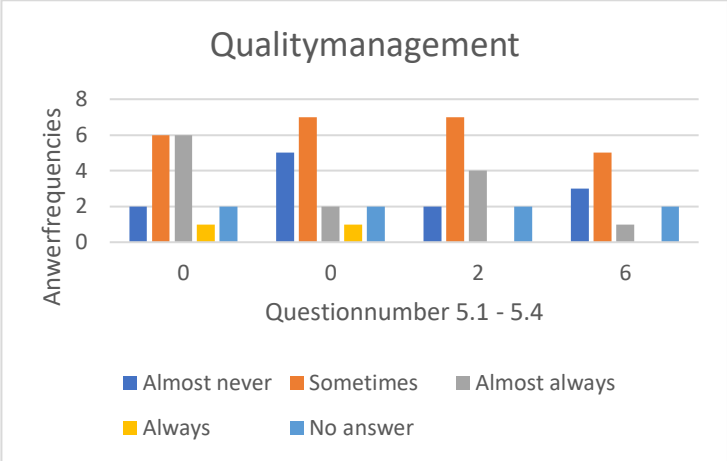
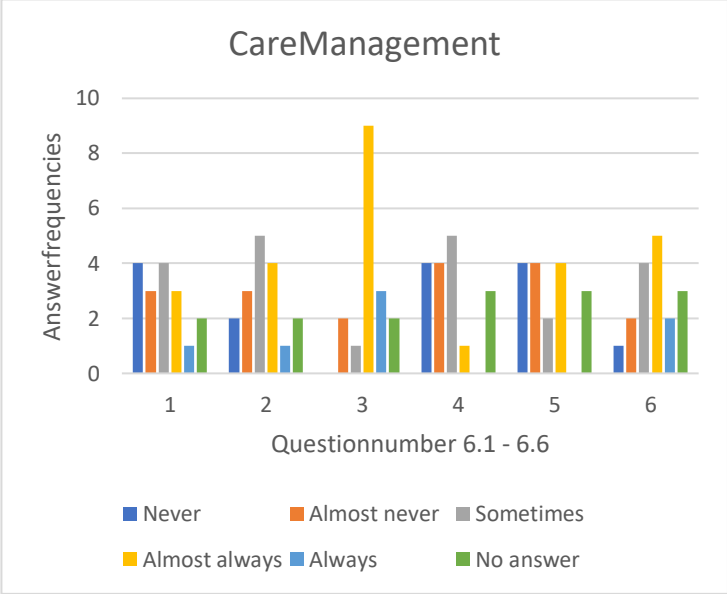
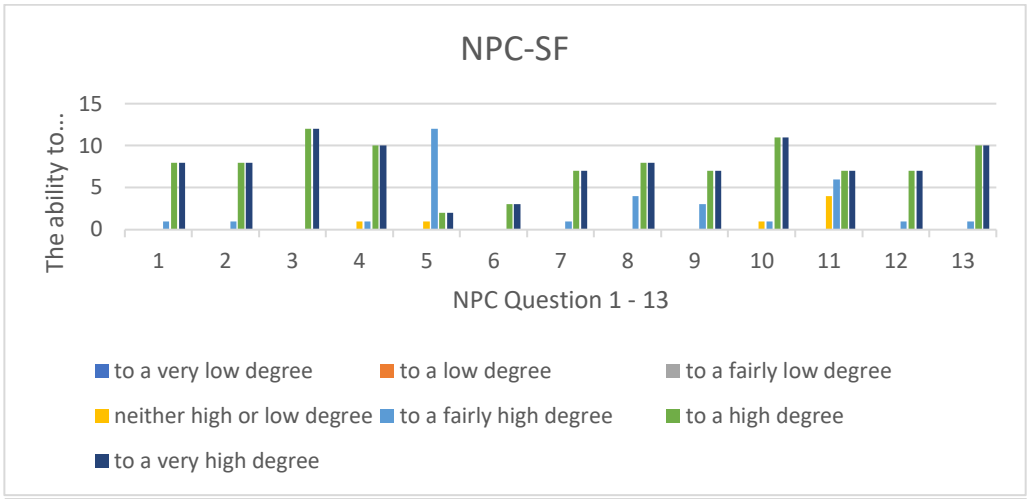
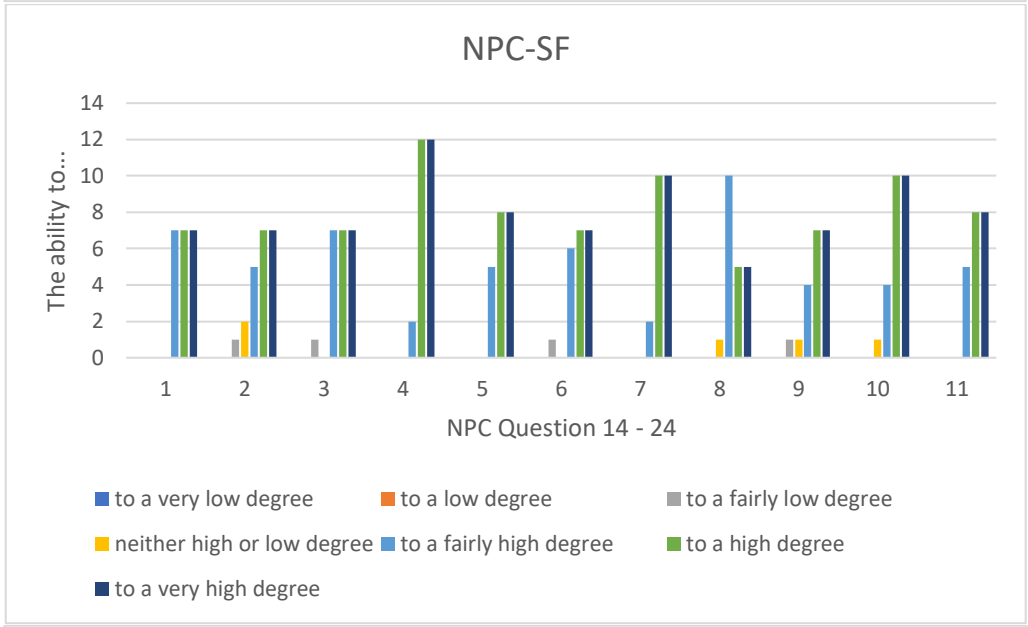
Almost never
Sometimes
Almost always
Always
No answer

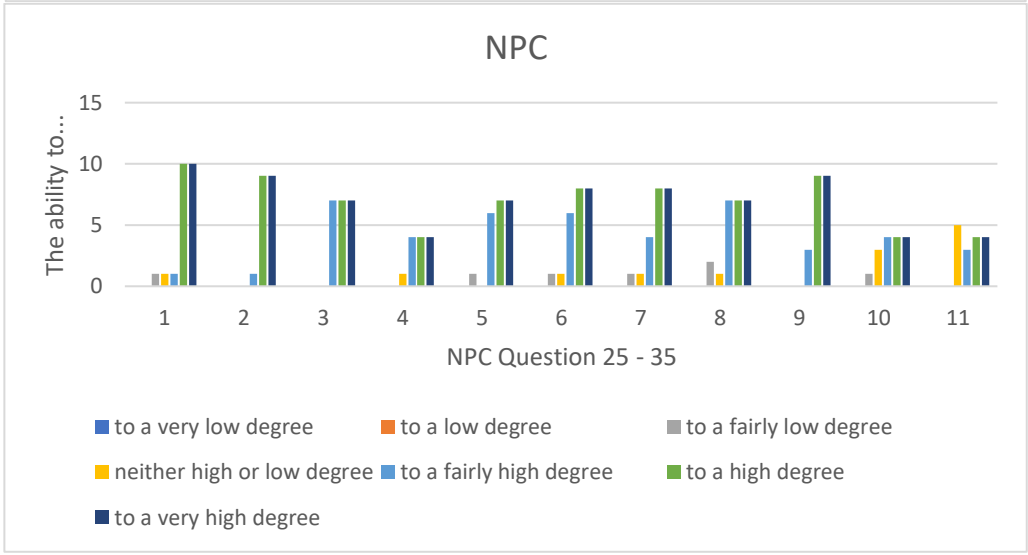

Qualitymanagement
Anwerfrequencies
8
6
4
2
0
0
0
2
6
Questionnumber 5.1 - 5.4
Almost never
Sometimes
Almost always
Always
No answer


CareManagement
Answerfrequencies
10
8
6
4
2
0
1
2
3
4
5
6
Questionnumber 6.1 - 6.6
Never
Almost never
Sometimes
Almost always
Always
No answer

Appendix I: NPC-SF Questionnaire and frequency analyses







Appendix J: Sample answers supervisors for qualitative analysis

Competence profile and getting to know the professional field	- "You didn't really know, yes, what does she have to learn now at the end of these days that she's with me?" (Interview 005, 00:03:13) - "But actually, I tried to teach her something that I thought made sense, more from a gut feeling. But not that I had a clear list or anything where I know, ah, yes, they must be able to do these and these competencies now." (Interview 007, 00:02:03). - "I think it's always important in a pioneering phase to leave things a little open and say we'll look. I think it's positive that you don't just regulate everything before you've had the first year. You can almost no longer react if you already make it final" (Interview 009, 00:21:35). - "I have the feeling that the job description already has potential, but perhaps it still needs to be sharpened a bit as to what exactly the competencies are. And where I see opportunities is a little bit like they do it in America, where you can really make a visit independently. And prescribe certain medications and so on. But I don't see that being possible in the current training. It's far too little clinically oriented and I don't see that happening there. And if you would align that a little bit more clinically, I feel like you could use these people much better on the front line, in the clinical day-to-day." (Interview 010, 00:13:32). - And if I may say, which is the most important thing, it's the same with an assistant, when you start delegating, I must be sure that I'm not putting the patient at risk. That only works if that person has good self-reflection and does what they can and if they're unsure, they ask back. And if someone just then tinkers, they put the patient at risk (Interview 001, 00:13:42). - "…So, I think a certain age, or a certain maturity and I think with the criterion of professional experience, that comes automatically, but I think it needs that. Then, they must be able to work independently on the one hand, but also be able to think or understand things. Certain cognitive abilities must be present." (Interview 007, 00:13:00)
Holistic view	- "It must be said that in a family doctor's practice, work is very problem-oriented, that's simply the way we work. And you can see that our ANP thinks very broadly and includes social aspects, which is a challenge for both sides. If someone comes in with a sprained ankle, then we know what to do. That can be dealt with in 15 minutes and then the professional situation is perhaps less important for us. I'll use that as an example. And it's important for them because they want to ask about it and hear a little bit about how it's going, and then you realize that maybe it's something we don't do enough or don't have enough time for, and on the other hand it's beyond our scope. Sometimes we go to the next patient, and she continues to talk to the patient. That is also a benefit for us,

	that someone can listen for a longer time and open the focus a bit." (Interview 010, 00:04:21). - I think that's, you can tell, the nurse training and the communication, the social skills, so they're very good (Interview 010, 00:01:40).
Outpatient setting	- "…and then also, for example, in the outpatient area, the networked thinking. So, it's not just this role, but it's based on extremely close cooperation." - "…You have to be able to deal with a Spitex, how does it work there, then you have to work with the hospitals, with other services, with mobile or physiotherapy, and and and." - "…and you can already see that there is a bit - sure, you could also say that it is somehow a matter of experience - but these are things where I think that they are not given enough. And there really is also a strong case management in it. So that is part of it." (Interview 003, 00:14:31) - "She said, yes, I need much more time and how do you do that. And then she had to learn that she simply had to ask questions in a specific direction and perhaps not always be able to ask the whole range of questions, but that one simply had to talk about the main problem. And that you simply have a bit of limited time and that you simply can't control overtime, but you must decide at some point." (Interview 006, 00:08:57)
Organizational Development	- "…so, we talked for a long time about where the position of these people is in a hospital, where should they be attached? I said, for example, that if they were simply to be attached to the nursing staff and told that you now must bridge the gap with the doctors, then everyone would quit after two months, because they can't do that. That is an issue that would have to happen in the management. And that's how we discussed it, and I believe that with this knowledge, a direction, a structure, and a profile and a perspective will emerge." (Interview 009, 00:21:35) - "…My willingness and from my side here in the clinic is always there and I think we always welcome it very much, through the experience that we have had, but not only, we discuss it at the director level, we will even, so I also say I would hire one immediately, on the spot, so I would have no problem to create a position and so I think I think it's great that you can do that." (Interview 004, 00:21:28)
The ideal patient	- "…but I think it works very well everywhere where you have a certain grouping of patients, where you also need a certain standardization and where the nursing care, the way you deal with the patients, the educational aspects, plus the medical aspects come together. And whether it's a heart failure consultation, it can also be a pneumologist's lung functions, asthma patients, it can be a psychosomatics with intestinal complaints, the stomach ache patient." (Interview 009, 00:11:20)

	- "…In primary care with the family doctors, in the emergency wards, in any number of things between the family doctor and the emergency wards, urgent care centers, all these things could be equipped. They would certainly reduce costs in the long term, because we don't do emergency ward medicine, but just stick on a band-aid and check again in two days. Also, for people who don't have a family doctor or where the family doctor doesn't have an appointment until next week." (Interview 002, 00:22:31) - "The ideal patient, that is somehow the polymorbid patient, without help and it is about organizing with all helper systems, because this case management or co-case management in the system so." (Interview 010, 00:23:28) - "Less good is so the acute patient "I have a stomach ache". This is a physician topic" (Interview 008, 00:09:25)
Legal anchoring and tariffing	- "Who's covering for me? Who covers me or me the work or this more and more medical practices that now have Nurse Practitioner, all more or less basically illegally employ. So respectively not employing illegally, billing illegally. Employing is not illegal, but billing is yes, if it is taken strictly, in the illegal area. Who is covering us?" (Interview 008, 00:26:29) - "It is simply the policy, where you must call a spade a spade, that simply does not move forward. The will of the people is clear, it has been expressed for almost a year. The politicians have had a clear mandate since November of last year to implement it within eight months. Not much has happened in this regard. And that is something where I have to say, it is increasing, the supply and access problem. Especially since the foreign physicians are no longer allowed to work in a practice in Switzerland, just like that, but they first must work for three years in an official training center. This of course creates a very tense personnel situation for many GP practices." (Interview 001, 00:24:53). - "…I have the feeling that it already has potential, the job description, but perhaps it still needs to be sharpened a bit as to what exactly the competencies are. And where I see opportunities is a little bit like they do it in America, where you can really make rounds on your own. And prescribe certain medications and so on. But I don't see that being possible in the current training." (Interview 010, 00:13:32)
Communication and anamnesis	- "…For me, the be-all and end-all in primary care is really the interview, the history taking." (Interview 005, 00:07:08) - "In a case history, we are always told to ask an open-ended question to get started. We should ask what brings them to us, the patients. I have made the experience, in our practice it is not favorable at the beginning, because the patients are completely confused. They are primarily registered with a request and the patients then have the feeling that they have not been read in, that they have not been read into the

	documentation. And the patients then feel like they've been a little bit shoved in the face and then say, well, don't you know why I'm here?" (Interview 001, 00:06:23) - "So certainly, a clear standing, a clear demeanor, knowing that they are just Nurse Practitioners, and they can do something. Clear appearance in the sense that they must know that they are on the same level as the doctor, like the female doctor, simply in a different skill. That's important to me. Social skills are quite important. We also noticed that with the intern, how do I deal socially, how do I approach people? Can I meet people, can I meet people in the most diverse life situations with the most diverse life attitudes, attitudes? Can I hold back my personal opinions, attitudes, etc.? I think that is very important." (Interview 008, 00:14:01) - "…then we let them take the anamnesis themselves, then we let them take the status themselves and we discuss and then the senior physician does the review accordingly" (Interview 004, 00:04:53) - "What counts for me is procedure and assessment, the case history, these are the three factors, everything else can be copied and pasted from the system - and to consider in the assessment why I did that, why I did not do that or why I do not wish to do that. And that was very important for me, that this flow of thoughts comes." (Interview 004, 00:05:50)
Where is the Nurse?	- "One notices however also from the Nurse Practitioner they have really a deepened knowledge, but there I ask myself also, partly some knowledge, which it does not need. So partly too deep, too medical, where the basics are missing, where you have to say, yes, we have not studied medicine." (Interview 003, 00:09:34) - "…but what's also missing from this degree program is the N, Nurse. That gets lost a little bit. And I think that's quite a shame. That, again, the CNS, I think, brings more to the table there." (Interview 003, 00:09:54) - "For example, we must hold an extremely large number of discussions. So, with relatives, it also goes over into coaching from care, for example, where we also help to support care. And these are things that they no longer bring with them. We think - I noticed this in the internships - the focus is really on the medical side, but there is still a lot of interpersonal work going on everywhere. Whether it's with patients or residents, or between caregivers in nursing homes or Spitex. If you can pick up the interpersonal aspects there, if you can deal with each other, then you can also implement this role. And it's just that, yes, these are not graduates and we also teach them things. Whether it's placing catheters in men or things like that, which they don't bring with them in some cases. And really, what is also extremely important, are the ethical aspects, we have a lot of ethical questions. Escalation levels come up in every entrance interview, how do I discuss it

	when it comes to death. Those are so many things that a nurse practitioner or an APN must bring to the table and that's so lacking a little bit.” (Interview 003, 00:10:30)

Appendix K: Sample answers students for qualitative analysis

Role finding & Organizational Development	- "Yes, because I'm supervised by an APN, yes. I say the primary care physicians don't know that I feel. Even though I'm a permanent employee there and they've been in this system for years, I don't feel like they know that. A little bit because they also see what my work colleague has been doing for years now, but I think not so clearly. And my work colleague already, but because it probably already just quite from B, she was sometimes also surprised what is required of me or what I don't have any room for in class. I don't have any room at all for in class." (Interview 004, 00:11:02) - And what happened was that the physicians didn't know exactly what competencies I was supposed to have. That was not clear to them. The school also did not make it clear what we could or could not and what we could be trusted with or not, because that hadn't existed until now either. For them this was because there were no documents available, and they thought "then we'll treat you like a medical student. we treat you like a medical student, and we also take what we have, when they are in our internship" (Interview 002, 00:02:20) - No. I don't think that's often the case. So, the supervisor was probably already a little bit informed a bit, but she didn't really know exactly what we were going to do afterwards. exactly afterwards. She always said that she treated me like a sub-assistant, so to speak, I'll put it that way now, but I don't think that was a bad thing in and of itself. And the senior physicians, the others, they were also not very well informed by the supervisor. informed by the supervisor, they really didn't have any idea what to do with me. what they should do with me now and that was perhaps also the reason why the relationship of reason why the relationship of trust on their part was difficult, because they just not known what we were learning, what our goal was, and you could tell that some of them were and you could tell that some of them were a little suspicious that someone from the from nursing and is supposed to work like a medical student. So, I also had situation with one of the senior physicians, where you really noticed that she was with the medical student, and he was always able to present the patients directly. and absolutely no problem, and with us as nurse practitioners, she always communicated with us through the communicated with us through the assistants (Interview 005, 00:11:57) - "So actually, it was like this, in the beginning it just took a bit of training time because where I was, at the family practice, he also did it for the first time. We had to find something for each other first." (Interview 011, 00:02:52) - So, the construct he had to get to know, I might have to put it that way. So, someone from the someone from the BFH also visited him in practice beforehand, explained to him explained the structure of the study program. But in the end,

	we also looked together, what do I want to learn, what are my goals and have tried to implement that tried to implement them a bit. So, it was a bit of finding at the beginning. I didn't have the feeling that he knew from the start that this and that were my goals. I also found it a bit difficult from school at the beginning because I didn't have very clear goals about what we were supposed to learn. That's why it was simply a mutual finding out." (Interview 011, 00:04:02) - "I am the first person to have done an internship there. internship there. What was a bit difficult for my supervisor, too, was that he didn't know exactly what he could ask of me, what I should know. He has always asked me questions, but he also knew that I was a nurse and not a physician, and maybe he can't ask the same questions as the residents. Yes. That was perhaps a bit of a difficulty. And for me it was something new for me, and I also find it difficult to say whether he should have should have demanded more from me during the entire internship, whether I was challenged enough. I also talked to other colleagues, but it's just so different, because one was in psychiatry, the other in psychiatry, the other in the physician's office." (Interview 008, 00:04:01)
Outpatient Setting	- "If afterwards things like taking blood or sugar or something like that, if the medical office assistant didn't have time, I was allowed to take over." (Interview 011, 00:02:52) - "For me it was the first time that I had worked in the outpatient sector. I had previously worked in the inpatient sector as a nurse. But during the internship I knew right away that we were needed here. I simply saw the potential right from the start, and the more days I went, the more I realized I could do. more and more, I also somehow gained the trust of the patients a little bit. And that's what showed me afterwards, that's the area I would like to work in, if that's possible. Yeah, because I just saw the potential. And that's what showed me afterwards, that's the area I would like to work in, if that's possible. Yeah, because I just saw the potential of a Nurse Practitioner in the outpatient setting. But it's clear it's a different kind of work. I notice it even now that I'm working as a Nurse Practitioner, I have other responsibilities and just in general the outpatient area simply functions simply differently from the inpatient". (Interview 011, 00:05:21) - "So, you know personally when you go to the family doctor, how quickly it happens. how quickly it happens. But being able to focus on treatment in such a way and that you don't forget anything in this short time is a massive challenge. Yes. It was exciting, but it was also an introduction. Certainly, a whole new area." (Interview 010, 00:13:28)

Planning and theoretical content for the module	- “But 50 days to get to know each other and to care for these patients together, it also makes sense. You then also become more effective together. So, I have the feeling that if you were to change in the middle, then it would be a start again from scratch, which would perhaps help me to learn the skills, but it would also but a lot would also suffer.” (Interview 010, 00:12:24) - “It has certainly been a very high level in part because it has often also been taught by specialized physicians for us from the basic training of nursing has been taught. They have also not known what prior knowledge we have, how is it now, but that was impressive, we have had very good lecturers throughout.” (Interview 010, 00:17:07) - “So, I simply copied that from him, quite clearly, because in the module "Clinical assessment", it was no longer a topic to practice this again in practice, and that was I missed that extremely, because I haven't done that for 8, 9, 10 years. So, I had I had already taken out a stethoscope, but not so specifically.” (Interview 009, 00:04:38) - “So, I would have liked a little bit more support or more that you could have brought it up, maybe the possibilities of how to approach it. So, it also benefited me a little bit, I think my age and my professional experience, that I could then already handle it well. But I think it can make you feel insecure, and I think it can also be that these internship days then become a burden, or I have also seen it with other students that it then becomes stressful. that it becomes stressful. Maybe showing possibilities, how to work together or what such a day might look like” (Interview 009, 00:07:34) - “50 days is certainly a good number of days, but I think, yes, I feel totally fit in all these areas now. now feel totally fit in all these areas. From that point of view, I already have the feeling that one can certainly learn more.” (Interview 008, 00:10:50) - “Heart, lungs, abdomen is certainly the kind of thing you do on almost everybody. Stop because we are now more involved with the older people, that you really do really look there with the whole water balance. Cardiopulmonary is just always a bit of a topic.” (Interview 007, 00:13:19) - “Less certainly not, I would say now, but I had the feeling it was not bad, these 50 days. On the other hand, I have now also said, it is good, that I now have a position as a nurse practitioner, so that it doesn't get lost in the year when we don't really have anything more practical. Well, it wouldn't get lost completely, but it wouldn't fall so far behind. Because if I were to continue working as a normal diploma, then yes, you might try it maybe sometimes. So, you also have this whole way of thinking when you work as a nurse. You can assess patients better as a diploma holder, judge them

	differently, and yet you can't really let off steam." (Interview 005, 00:27:35)
Where is the Nurse?	- "It was very much medical, because I also learned from a physician, and I also noticed that. And I think it was also a large part of these days, but nursing were also the areas where the physician has told, which would rather be settled in the care, which she takes over in the practice itself, where we have then discussed both of our experiences together. So, where I see a big point, are the whole wounds, which are always a topic in the practice. There she told me a bit about her knowledge, then I told her about the practice and a large part of it is also where the physicians have taken over, which I also see as part of nursing, are the consulting functions. Maybe lifestyle topics, have seen many diabetics now, but also often conversations, maybe with patients with psychological preload, that was also a topic again and again. What is clearly medical or clearly nursing there is not quite clear to me, I think it's more like a treatment team, but there is an overlap between these two trainings." (Interview 010, 09:20) - "Coaching, leadership, so I may have been involved in a conversation where it was also ethically a bit more difficult or where you had to make decisions, but that was rather rare. And I have not I didn't take over or anything." (Interview 008, 00:09:08) - "What I find difficult now, how can I implement this now. How do I find a that I like that I can develop, that I can work on. And the thing that just is that you can bring in the nursing part. Because, for example, in a family practice, for example, I'm less able to bring in a nursing component than I am in a pediatric practice, where my entire nursing experience is part of it. Where elsewhere I can't bring in this nursing experience, which is part of it, because I haven't done it." (Interview 001, 00:29:48)