University of
South-Eastern Norway

Kirsten Røland Byermoen

Fit for practice

Exploring competence in physical assessment from the final educational year to two years as a newly graduated nurse: A qualitative study

Dissertation for the degree of Ph.D
Person-centred Health Care

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Health and Social Sciences

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Preface

When I joined the nursing faculty in 2013, I identified myself as a practical educator, seeking to teach students how to identify changes in patients' clinical conditions. When our university introduced physical assessment into the undergraduate nursing education in 2015, I had an experience of 'coming home'. I could introduce the students to even more specific observational tools, which I had needed when I was a practicing nurse. I participated in the physical assessment course in the master's programme for advanced practice nursing. I began taking extra shifts in the hospital to practise my newly acquired skills, so that I was in a position to better understand the experience of using physical assessment in the clinical environment.

I started to collaborate closely with my colleague Ösp Egilsdottir, assuming responsibility for tutoring students and teaching courses to already registered nurses in physical assessment. Being at one of the first educational institutions to systematically introduce physical assessment in undergraduate nursing education in Norway, we saw the importance of an evaluation study of nursing students' use of physical assessment in the Norwegian context. Our findings inspired two PhD projects: Ösp Egilsdottir emphasized how the use of digital learning resources could support students' physical assessment application during clinical rotation; and I explored (a) the learning process of using physical assessment during clinical rotation and (b) influencing factors from the last educational year to two years after graduation.

During the evaluation study (in 2018), we both acquired a research grant from the Thon Foundation of 1.5 million NOK for a research project emphasizing the integration of human bioscience knowledge and physical assessment. This grant contributed to finance my PhD project. My PhD project also contributes to the Faculty of Health and Social Sciences' aim of developing knowledge on how to educate for clinical competence in nursing education (the RECCINE project).

Acknowledgements

It takes a village to raise a candidate to conduct a PhD research project. At least, that is how I feel about this PhD journey, where there are so many people I want to thank and acknowledge.

I want to start with expressing gratitude to former Dean Heidi Kapstad at the Faculty of Health and Social Sciences and former Leader Lise Gladhus at the Department of Nursing and Health Sciences, who provided partial funding for this PhD project and accommodated my schedule. The grant from the Thon Foundation was the most important gate opener, as it gave me the possibility to initiate this project.

I want to express my gratitude to my super-team of supervisors, Professor (Emerita) Hilde Eide, Professor Anne Moen, Professor Lena Günterberg Heyn and Associate Professor Espen Andreas Brembo. Hilde has been dedicated, supportive, inclusive and professional, and has been an inspiring main supervisor. Hilde, I will be forever thankful for how you have challenged me while simultaneously sharing your knowledge and including me in your research network and academic family. You were able to tell when I needed to be challenged and when I needed support and reprieves.

I met Anne in 2011, as she was my supervisor for my master's thesis. Anne, I am grateful to you for seeing the potential in me and the project and wanting to be my co-supervisor. Your extensive competence within various research fields and your innovative mindset has been immensely valuable for me and the PhD project.

Lena, your support and knowledge has been a great contribution. Our informal yet formal conversations have meant much to me, on a personal and professional level. Your focus on communication in research and in the texts has been of great importance.

I want to express my gratitude to Espen. We have spent countless hours during our analysis processes, and your reflective and curious questions have given me new insights. Your approach to the texts in our studies has been inspiring. Your presence in

the office was important on all those days when I needed to engage in a brief discussion or longer reflection.

I would also like to thank Professor Emeritus Tom Eide, with whom I have collaborated closely on two of the studies. I have learned a great deal from your knowledge and approach when presenting our findings, and you have inspired me to further explore qualitative research approaches.

In addition to my research team, I want to thank my fellow PhD candidate, Ösp Egilsdottir. Our fruitful collaboration led us to embark on this PhD journey together. I am grateful for the mutual understanding we shared, during both good times and challenging moments.

The RECCINE project fellowship was immensely supportive, providing me with the opportunity to discuss and present work in progress. Throughout my PhD project, I have received tremendous support from the other PhD candidates in the person-centred practice programme. Thank you, all!

I especially want to thank the study participants. The students (and later, nurses) let me follow them for a lengthy period of time, in their life and during their education. Pivotal to this project was their sharing of their thoughts and reflections. I still hear their voices when I read excerpts from the interviews.

I am also humbled by the patients who participated in this research project. They let me into their private sphere and enabled me to learn more about the complexity of their current situation. I will be forever grateful for having such close proximity to their reality. I would also like to recognize the nurse managers and institutional leaders in Drammen municipality for their collaboration and for being central stakeholders in enabling me to collect the data.

On a more personal level, I want to thank my dear family and friends. I appreciate your encouragement and support throughout these years. It means a great deal that you

have taken the time to show interest in my work and read my publications, even though it was not always easy to understand the content.

I would like to express my gratitude to my children, Edvard and Johanna. You have helped me to focus on the most important things in life and given me much-needed breaks during the project. I especially want to thank my husband, Tom. Without your figure illustrations, this dissertation and the respective studies would not have been the same. You patiently listened to my instructions during the design process. But mostly, I want to thank you for being so supportive: I could never have done this without you. You are my rock.

Abstract

Background: Nurses' competent use of physical assessment is needed to detect deterioration and initiate interventions to prevent complications from occurring. Research shows that nursing students and nurses do not perform physical assessment during daily practice, as taught on campus. Identified barriers are complex and multifaceted, with contextual differences, lack of time, lack of role models and overall workload as some of the reasons. Several studies recommend reducing the scope of physical assessment curriculum in undergraduate nursing education to overcome the barriers. In 2015, on one University of South-Eastern Norway campus, we developed and introduced a pedagogical education model designed for learning and practising physical assessment.

Little is known about (a) students' development of competence in physical assessment during their last year as an undergraduate and (b) the reasoning processes accompanying their performance and learning. Furthermore, no identified studies have explored this in depth, following the same students as they become newly graduated nurses. The motivation for the current study was thus to understand how the students practised physical assessment with patients; how they perceived their own competence development; and how the clinical context supported their learning process.

Aim: The aims of this dissertation were threefold: (1) to explore nursing students' use of physical assessment during their clinical rotations in two consecutive rotations in their last educational year, (2) to explore the development of competence in physical assessment from the last educational year to two years after graduation, and (3) to explore contextual factors facilitating or hindering the use of physical assessment.

Materials and methods: The dissertation as a whole had a qualitative design that included the use of exploratory research methods in three empirical studies, following the same students from the third and last year of their education to becoming newly graduated nurses.

Studies 1 and 2 have a qualitative explorative design, using participatory observation and stimulated recall interviews. Ten nursing students participated in study 1, of whom nine participated in study 2. The students practised physical assessment with a patient during their two last clinical rotation courses. The encounter was observed and audio recorded. This was followed by a stimulated recall interview: The student and the researcher listened to the recording together and the student reflected on their own performance of physical assessment.

The critical incident technique was used in study 1 to analyse and capture similarities, differences and patterns across the interview transcripts. Phenomenological hermeneutical analysis was used in study 2 to explore the students' learning process and how they experienced their physical assessment performance.

In study 3, eight of the participants (from studies 1 and 2) were interviewed after they had worked for two years as a nurse, to obtain insight into how they used and further developed their assessment practice. Phenomenological hermeneutical analysis method was also applied in this study.

Main results: This research project explored in depth how nursing students use physical assessment and how they reason with regards to their assessment findings; it also followed them through their first years as a newly graduated nurse. The main results of the dissertation are:

(1) The students initially had a task-oriented approach, in which assessments were based on following a specific checklist. In their last clinical rotation, the students seemed to have integrated physical assessment as a part of a holistic nursing approach. The students chose assessments to perform based on their reasoning concerning the patients' symptoms and expressed concerns. Communication played a central role in the assessment.

(2) The students developed the ability to integrate and cluster various information sources in their reasoning process during physical assessment practice. Their initial focus was on physical assessment as a technical task, where the rationale of using specific

skills was based on checklists. This then transformed into an internalization of physical assessment as a premise for providing person-centred fundamental care by integrating a holistic and symptom-based approach in their daily nursing practice, in which their reasoning around which skills to use could be described. Moreover, their reasoning included considerations of assessments and initiated interventions.

(3) Contextual factors influenced students' use of physical assessment. Identified facilitators were that the nursing students needed scaffolding, both in on-campus learning activities and in the clinical environment. Moreover, collaboration with other health professionals was of great value, as it initiated articulation and reflections related to clinical reasoning. Recognition from a work environment was central for students and nurses to have the confidence to use physical assessment. Organizational factors were identified as barriers to using physical assessment; these factors included a culture's lack of receptivity towards the use of physical assessment. This could involve the lack of an invitation or opportunity for nursing students and nurses to use physical assessment in the clinical environment. For nurses, a heavy workload was an important barrier, as other practical tasks had to be prioritized.

Conclusion: Developing competence in physical assessment is a complex process which transforms one's view of what physical assessment is and how it can become an integrated part of person-centred fundamental care. However, educators and nurse managers are important to building a supportive learning environment that scaffolds both nursing students' and newly graduated nurses' continuing practise of physical assessment. Reflective practice – in which students perform assessment based on a symptom-based approach and clinical reasoning – may facilitate a more targeted competence development, closing the gap between learning activities on campus and in the clinical environment. Findings also indicate that close collaboration between educational institutions and the clinical environment would enhance nursing students' and newly graduated nurses' further physical assessment use and development. Researchers, educators, nurse managers, nurses and nursing students can benefit from these findings, as they provide new understandings of how competence in physical

assessment is learned. However, future studies should explore how different clinical contexts, learning environments, and the roles of precepting nurses and nurse managers influence and scaffold the development of competence in physical assessment. Moreover, explorations of how the influencing factors inform the overall clinical judgment competence in both nursing students and nurses need further elaboration.

Keywords: physical assessment, clinical reasoning, clinical judgment, competence development, learning, person-centred fundamental care, nursing education, newly graduated nurse

Sammendrag

Bakgrunn: Kompetent bruk av systematiske kliniske undersøkelser og vurderinger (SKUV) er nødvendig for å oppdage forverringer og initiere intervensjoner for å forhindre at komplikasjoner oppstår. Forskning viser at sykepleierstudenter og sykepleiere ikke utfører SKUV i daglig praksis, slik de lærer på campus. Barrierer er komplekse og mangefasetterte; kontekstuelle forskjeller, mangel på tid, mangel på rollemodeller og høy arbeidsbelastning er noen av grunnene. Flere studier anbefaler å redusere omfanget av pensum for SKUV i sykepleieutdanning for å overvinne barrierene. I 2015, ved en campus på Universitet i Sørøst-Norge, utviklet vi og introduserte en pedagogisk utdanningsmodell designet for læring og utøvelse av SKUV.

Det er lite kunnskap om (a) hvordan studenter utvikler kompetanse i SKUV i løpet av sitt siste år utdanningsår og (b) hvilke tanke - og vurderingsprosesser som ligger til grunn for deres læring og utøvelse av SKUV. Dette er ikke tidligere utforsket i dybden ved å følge de samme studentene når de blir nyutdannede sykepleiere. Motivasjonen for denne studien var derfor å forstå hvordan studentene utfører SKUV hos pasienter; hvordan de opplevde sin egen kompetanseutvikling; og hvordan den kliniske konteksten støttet deres læringsprosess.

Mål: Målene med denne avhandlingen var tredelt: (1) å utforske sykepleierstudenters bruk av SKUV i kliniske praksisstudier i to praksisperioder i løpet av siste utdanningsår, (2) å utforske utviklingen av kompetanse i SKUV fra det siste utdanningsåret til to år etter endt utdanning, og (3) å utforske kontekstuelle faktorer som fremmer eller hemmer bruken av SKUV.

Metoder: Avhandlingen som helhet hadde et kvalitativt design som inkluderte bruk av utforskende forskningsmetoder i tre empiriske studier. De samme studentene ble fulgt fra det tredje og siste året av deres utdanning til å være nyutdannede sykepleiere.

Studie 1 og 2 har et kvalitativt utforskende design, med metodene deltakende observasjon og «stimulated recall» intervjuer. Ti sykepleierstudenter deltok i studie 1,

hvorav ni deltok i studie 2. Studentene gjennomførte SKUV av en pasient i de to siste kliniske praksisperiodene i utdanningen. Situasjonen ble observert og tatt opp digitalt. Rett etter møttes student og forsker til et «stimulated recall»-intervju: de lyttet til opptaket sammen og studenten reflekterte over sin egen handlinger.

Analysemetoden «critical incident technique» ble brukt i studie 1 for å fange likheter, forskjeller og mønstre på tvers av intervjuene. Fenomenologisk hermeneutisk analyse ble brukt i studie 2 for å utforske studentenes læringsprosess og hvordan de opplevde egen SKUV -utførelse.

I studie 3 ble åtte av deltakerne (fra studie 1 og 2) intervjuet etter at de hadde jobbet som sykepleiere i to år, for å få innsikt i hvordan de brukte og videreutviklet sin vurderingsutøvelse. Fenomenologisk hermeneutisk analysemetode ble også brukt i denne studien.

Hovedresultater: Hovedresultatene av avhandlingen er:

(1) Studentene begynte i utgangspunktet med en oppgaveorientert tilnærming, der vurderinger ble basert på å følge en bestemt sjekkliste. I deres siste kliniske praksisperiode virket det som studentene hadde integrert SKUV som en del av en helhetlig sykepleietilnærming. Studentenes handlinger baserte seg på deres resonnement om pasientenes symptomer og uttrykte bekymringer. Kommunikasjon spilte en sentral rolle i deres vurderinger.

(2) Studentene utviklet evnen til å integrere og anvende ulike informasjonskilder i deres resonneringsprosess når de gjennomførte SKUV. Deres innledende fokus var på SKUV som en teknisk oppgave. De baserte seg på sjekklister når de begrunnet bruk av spesifikke undersøkelsesferdigheter. I siste praksisperiode var dette endret; SKUV var internalisert som en forutsetning for å gi person-orientert grunnleggende omsorg. Ved å integrere en helhetlig og symptom-basert tilnærming i daglig sykepleiepraksis, beskrev de resonnementet rundt hvilke ferdigheter de skulle bruke. Videre inkluderte deres resonnement evaluering av vurderinger og igangsatte intervensjoner.

(3) Kontekstuelle faktorer påvirket studentenes bruk av SKUV. Fremmende faktorer var et støttende læringsmiljø, både i læringsaktiviteter på campus og i det kliniske miljøet. Videre var samarbeid med annet helsepersonell av stor verdi, da det initierte artikulasjon og refleksjoner knyttet til kliniske vurderinger. Anerkjennelse i det lokale arbeidsmiljøet var sentralt for at informantene både som studenter og sykepleiere skulle ha tillit til å bruke SKUV. Organisasjonsfaktorer ble identifisert som barrierer for å bruke SKUV; disse faktorene inkluderte at arbeidsplassen ikke støtter bruken av SKUV. For de nyutdannede sykepleierne var tung arbeidsbelastning en viktig barriere, ettersom andre praktiske oppgaver måtte prioriteres.

Konklusjon: Utvikling av kompetanse i SKUV er en kompleks prosess som endrer ens syn på hva SKUV er og hvordan SKUV kan bli en integrert del av personorientert grunnleggende omsorg. Utdanningsinstitusjoner og sykepleieledere er viktige for å bygge et støttende læringsmiljø som legger til rette for at både sykepleierstudenter og nyutdannede sykepleiere skal fortsette å anvende SKUV etter uteksaminering. Reflekterende praksis - hvor studenter utfører vurderinger basert på en symptom-basert tilnærming og klinisk resonnering - kan fremme en mer målrettet kompetanseutvikling, og tette gapet mellom læringsaktiviteter på campus og i det kliniske miljøet. Funnene indikerer også at et nært samarbeid mellom utdanningsinstitusjoner og det kliniske miljøet vil styrke sykepleierstudenters og nyutdannede sykepleieres videre bruk og utvikling av SKUV. Forskere, utdannings-institusjoner, sykepleieledere, sykepleiere og sykepleierstudenter kan dra nytte av disse funnene, ettersom de gir nye forståelser av hvordan kompetanse i SKUV læres og anvendes. Imidlertid bør fremtidige studier utforske hvordan forskjellige kliniske kontekster, læringsmiljøer og rollene til veiledende sykepleiere og sykepleieledere påvirker og støtter utvikling av kompetanse i SKUV. Videre er det behov for å utforske hvilken innvirkning de ulike faktorene har på sykepleierstudenters og sykepleieres kliniske vurderingskompetanse.

Nøkkelord: SKUV, klinisk resonnering, klinisk vurdering, kompetanseutvikling, læring, personorientert grunnleggende omsorg, sykepleierutdanning, nyutdannet sykepleier.

List of studies

Study 1

Byermoen, K. R., Brembo, E. A., Egilsdottir, H. Ö., Heyn, L. G., Moen, A., & Eide, H. (2021). Reflection on actions: Identifying facilitators of and barriers to using physical assessment in clinical practice. *Nurse Education in Practice*, *50*, 102913. https://doi.org/10.1111/jan.15631

Study 2

Byermoen, K. R., Eide, T., Egilsdottir, H. Ö., Eide, H., Heyn, L. G., Moen, A. & Brembo, E. A. (2022). Nursing students' development of using physical assessment in clinical rotation—a stimulated recall study. *BMC Nursing, 21,* 110. https://doi.org/10.1186/s12912-022-00879-1

Study 3

Byermoen, K. R., Brembo, E. A. Egilsdottir, H. Ö., Eide, T., Heyn, L. G., Moen, A. & Eide, H., (2023). Newly graduated nurses use and further development of assessment skills—an in-depth qualitative study. *Journal of Advanced Nursing,* 00, 1-13. https://doi.org/10.1111/jan.15631

List of tables, figures and pictures

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Selected abbreviations

ABCDE	airways, breathing, circulation, disability, environment
B-PAS	basic physical assessment skills
EWS	early warning score
FOCF	Fundamentals of Care Framework
NGN	newly graduated nurse
PAS	physical assessment skills
SRI	stimulated recall interview
USN	University of South-Eastern Norway

Terms and definitions used in this dissertation

Physical assessment skills	The technical psychomotor skills of inspection, palpation, percussion and auscultation applied to various organ systems
Physical assessment	The use of physical assessment skills, communication skills, reasoning skills and judgment skills
Competence in physical assessment	The competence to integrate and use communication and physical assessment skills; and the cognitive assessment skills of clinical reasoning and clinical judgment, by considering and initiating interventions
Clinical reasoning	The cognitive process and strategies to understand patient data, as well as to identify and diagnose patient problems
Clinical judgment	The cognitive process involved in making judgments to initiate interventions based on the reasoning process
Basic physical assessment skills (B-PAS)	30 physical assessment skills included at the University of South-Eastern Norway

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1 Introduction

An ageing global population with comorbidity and complex health problems is challenging the existing healthcare services and requires high-quality nursing (OECD/EU, 2018, p. 180). These concerns are also present in Norway, where the healthcare system is facing challenges in securing competent healthcare personnel. Additionally, Norwegian demographics predict that the ageing population will live in more rural areas, while the younger workforce will be located in urban settings (NOU 2023:4, p. 43). The Norwegian white paper 'Time for Action' calls for the exploration and introduction of new ways to share responsibilities to provide the right expertise at the right time in the right context, to meet future healthcare demands (NOU 2023:4, p. 132).

In nursing, it is a core concern to anticipate changes in patients' health situation, and nurses aim to take a person-centred approach. The goal of person-centred care is for patients to experience satisfaction and involvement in their care, as well as a feeling of well-being in the therapeutic environment (McCormack & McCance, 2017, p. 38). In person-centred care, the nurse considers the patients' individual experience of their health situations by using interpersonal skills to build a relationship; this requires that nurses have the competence to negotiate care options and provide holistic care. Moreover, person-centered care entails that nurses are committed to the job, demonstrate clarity of beliefs and values, and are self-aware (McCormack & McCance, 2017, p. 42).

Physical assessment has traditionally been used by physicians, as a data collection method to support diagnostic decision making. The increasing complexity of patient conditions required that the preconditions in patient care change, and nurses began including physical assessment in their practice. Nurses in the United States started to use physical assessment in the 1970s, and nurses in Canada, Australia and New Zealand began doing so in the 1990s (Lesa & Dixon, 2007). However, nurses do not have the same diagnostic aim as physicians when using physical assessment. They engage in an iterative assessment process of evaluation and revaluation to identify patients' health challenges before deterioration, to meet the patients' needs over time (Taylor et al.,

2005). Having a common, standardized assessment scheme and terminology with other health professionals fosters collaboration between health professionals and supports the continuity of high-quality patient care (Tang et al., 2018; Weller et al., 2011). This interprofessional collaboration also provides a joint understanding of other health professionals' complementary roles and facilitates a holistic assessment of patients (Edmunds et al., 2010).

Nurses' systematic data collection and active use of physical assessment are considered a core nursing competency and are part of the educational curricula worldwide (Morrell et al., 2021). In Norway, nurses have traditionally not used physical assessment but emphasized the use of more general assessments, such as the early warning score (EWS) (consciousness, temperature, pulse, blood pressure, respiratory rate and oxygen saturation) and the airways, breathing, circulation, disability and environment (ABCDE) assessment approaches. A newly implemented regulation for Norwegian nursing education emphasizes the learning objective that nurses must have the competency to use systematic observations upon graduation (Kunnskapsdepartementet, 2019). However, each educational institution may decide what 'systematic observations' include and how to meet this learning objective. It is unknown as to how many educational institutions have implemented physical assessment systematically in their nursing curriculum.

The University of South-Eastern Norway (USN) introduced physical assessment into the undergraduate nursing education on one campus in 2015. Thirty skills were included in the physical assessment curriculum, in which a pedagogical progression model for learning to use physical assessment was developed (Egilsdottir, Byermoen et al., 2019). In 2015, only one other Norwegian nursing education institution had documented the implementation of physical assessment (Breivik & Tymi, 2013).

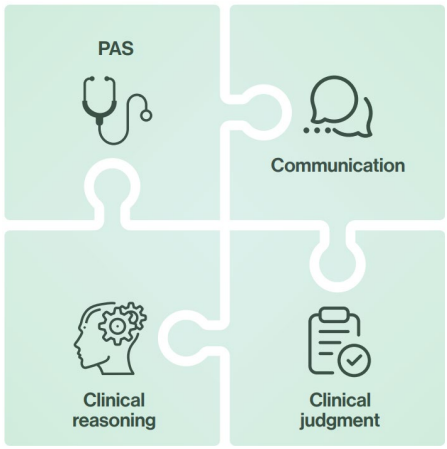
At the start of this PhD project, the main concern being reported in the literature was that nurses and nursing students applied only a subset of the physical assessment skills that they had learned during their nursing education; it was recommended that the physical assessment curriculum therefore be reduced (Birks et al., 2013; Giddens, 2007).

While most research has focused on addressing the barriers to using physical assessment and the practical implications for nursing education (Birks et al., 2014; Giddens, 2007), scant attention has been paid to the learning processes of developing competence in physical assessment.

1.1 Competence in physical assessment in nursing

In this dissertation, the term 'competence in physical assessment' includes four domains: (a) *communication*, which enables collaboration (and thus relationship building) with patients through subjective and objective data collection. In addition, communication enable collaboration with next of kin, colleagues and interprofessional teams (Jarvis, 2020, pp. 23-33); (b) *physical assessment skills (PAS*) – using the examination skills of inspection, palpation, percussion and auscultation to collect objective data from various organ systems (Reese et al., 1979); (c) *assessment* – using cognitive skills to analyse findings in a clinical reasoning process of performed PAS, as well subjective and objective data (Reese et al., 1979); and (d) *clinical judgment* – considering and initiating appropriate action alternatives (Hoffman et al., 2009). Figure 1 illustrates the domains included in physical assessment competence.

Figure 1: Domains included in physical assessment competence



With appropriate competence in physical assessment and proactive approaches, nurses can more accurately and rapidly detect deterioration and prevent complications from occurring.

To summarize, in this dissertation, 'physical assessment' is used as a term that includes the integration of communication skills, the clinical examination techniques of PAS, clinical reasoning and clinical judgment – competencies that form the basis for considering and initiating appropriate nursing interventions.

1.2 The progression model for learning physical assessment

The purpose of introducing physical assessment at USN was to enable nursing students to acquire the competence to respond to a health problem accurately while in clinical rotation and as NGNs.

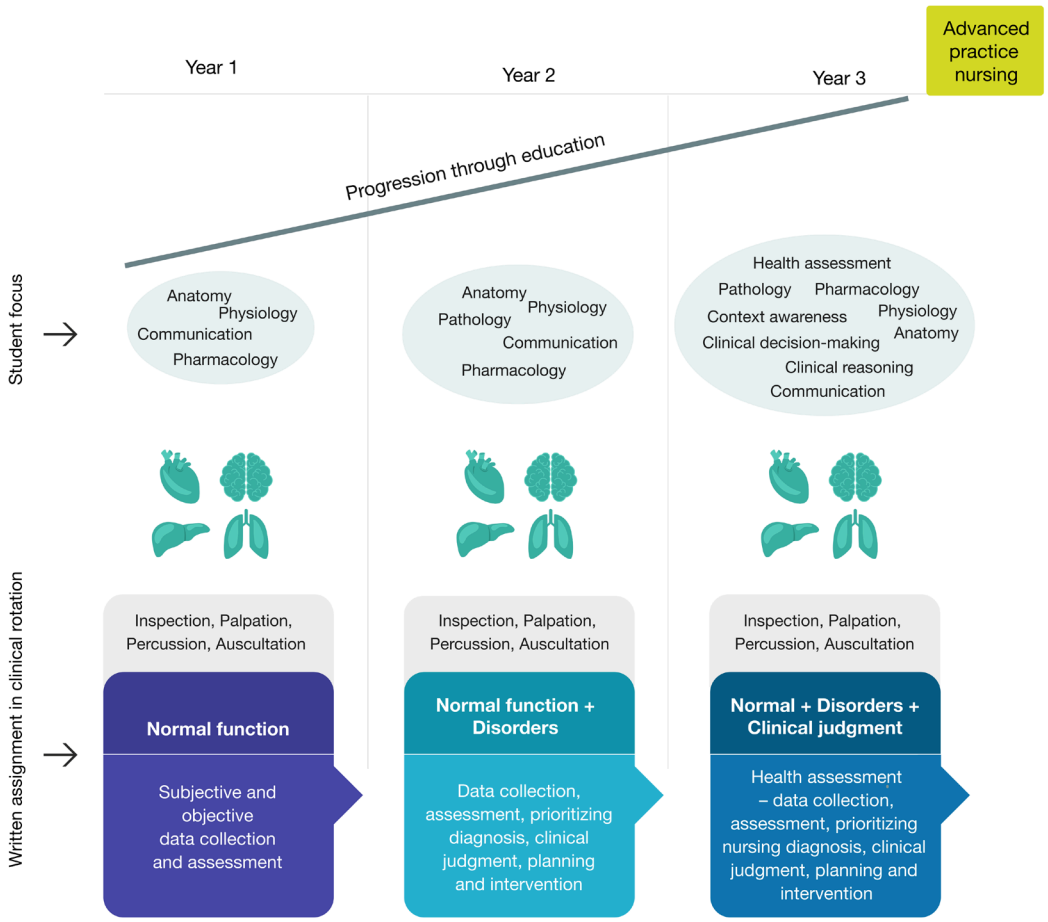
When designing the physical assessment programme at our university, we considered three key factors: (1) with a master's degree in advanced practice nursing at our university, there was a need to differentiate the level of the physical assessment curriculum in the bachelor's programme and in the advanced practice nursing programme; (2) Take the research about nursing students and registered nurses' use of physical assessment into consideration; and (3) the number of included PAS needed to be coherent with the overall nursing curriculum. Thirty skills were ultimately included and are referred to as 'basic physical assessment skills' (B-PAS). These included:

- the heart and peripheral circulatory system (11 skills)
- the respiratory system (7 skills)
- the abdominal system (6 skills)
- the neurological system (6 skills)

The physical assessment curricula mirrored and expanded the established use of the EWS system and ABCDE assessment approach in nursing education.

With the introduction of physical assessment, a progression model of teaching physical assessment, illustrated in Figure 2, was developed and published in our previous study (Egilsdottir, Byermoen et al., 2019). The progression model was developed to scaffold nursing students to (a) learn to use B-PAS, (b) apply reasoning to their findings and (c) suggest necessary precautions or interventions, throughout their education.

Figure 2: Progression model in the undergraduate nursing education



The image was obtained from Egilsdottir, Byermoen et al. (2019)

The progression model illustrates the relationship between learning to use physical assessment and the development involved with clustering complex information through reasoning and judgment processes. Throughout their education, the students practise the same sets of skills, but they are introduced step-wise to various foci, based on the curriculum in their theoretical and clinical rotation courses. Physical assessment was not introduced as a separate course but rather integrated into the existing courses in the education. Physical assessment was introduced in human bioscience and nursing courses, with the goal of reducing the theory–practice gap, as students could practise the skills in the simulation lab before entering the clinical rotation courses. The students were given written assignments during the clinical rotation courses based on their clinical reasoning and judgments of actual performed physical assessment with patients. In line with the European Union standards and Norwegian nursing education regulations, 50% of the nursing education takes place in clinical rotation courses in different healthcare settings, such as primary healthcare, hospitals and psychiatric care (European Union, 2013; Kunnskapsdepartementet, 2019). At our university, this is organized as six clinical rotation courses throughout the three-year programme of education. Each course spans 8 weeks/240 hours.

1.3 Outline of the dissertation

In the following chapters, I will present an overview of the empirical research and theory that represents the background for this dissertation. Chapter two presents various aspects related to physical assessment in nursing practice and education. Chapter three elaborates on reasoning and judgments processes, transformative learning in practice and the Fundamental of Care Framework, to ground this dissertation within developing competence in physical assessment. Chapter four outlines a detailed description of the aim of the dissertation. Chapter five describes the methods used in the study, and chapter six summarizes and synthesizes the results. Chapter seven discusses the results and methodology through the lens of previous empirical studies and the theoretical

perspectives outlined in chapter four. Lastly, chapter eight includes a conclusion emphasizing implications for practice and future research.

2 Physical assessment in nursing and nursing education

This chapter contains a review of key literature and research related to physical assessment in nursing. It will also provide an overview of nursing students' utilization of physical assessment, followed by a description of NGNs' readiness to implement physical assessment in their clinical practice. Nurses' use of physical assessment will then be outlined, after which educational approaches to support students' use will be presented.

2.1 Nursing students' use of physical assessment

Research addressing the use of physical assessment reports great variation as to which PAS students learn during education and what they practise. Regardless of the amount of PAS in the curricula, studies show that nursing students mostly apply a subset of the PAS they learn: specifically, skills related to vital signs and the EWS (e.g., temperature, blood pressure, breathing effort and oxygen saturation). Assessment of patients' mental status, such as the Glasgow Coma Scale, is also regularly used (Birks et al., 2014; Douglas et al., 2015). Core skills mostly include general observation and the use of inspection skills. More advanced skills – such as palpation, percussion or auscultation – are seldom or never used (Birks et al., 2014; Douglas et al., 2015). Of the 126 surveyed skills, head, ears, eyes, neck, thorax, breast, back/spine, cardiovascular, abdomen, genitalia and neurological assessment skills are predominantly never used (Birks et al., 2014; Douglas et al., 2015). Birks et al. (2014) reports an additional lack of using skills to assess the mouth, lips, mucous membranes, musculoskeletal system, neck, rectum and anus.

In a previous study that inspired this dissertation, we explored nursing students' use of PAS throughout their education (Egilsdottir, Byermoen et al., 2019). This study revealed that the nursing students increasingly practised PAS as they progressed in their education. However, there were variations in how often the different skills were used.

Despite having a curriculum that included 30 skills, the nursing students reported that they utilized about one third of the PAS frequently in their nursing practice. The most frequently used PAS were vital signs related to the EWS and inspection of the circulatory and respiratory organ systems. Auscultation and percussion skills were used the least. Auscultation of heart sounds, percussion for kidney tenderness, assessing cranial nerves I–XII and assessing reflexes were not used at all (Egilsdottir, Byermoen al., 2019).

An integral part of nursing students' use of PAS includes their ability to recognise cues (Burbach & Thompson, 2014). Nursing students' physical assessment performance can be compromised by limited knowledge and experience in cue recognition, showing that they tend to use more of the learned PAS techniques than the situation requires (Burbach & Thompson, 2014). Along the same lines, inexperienced nursing students may also lack awareness when new cues arise, and these may thus remain unassessed (Ashley & Stamp, 2014). With more experience and increased competence in clustering complex sets of information, nursing students can perform more targeted use of PAS and cue recognition (Burbach & Thompson, 2014; Hoffman et al., 2009).

Due to the above findings, research has explored barriers to nursing students' PAS application. Lack of competent role models to support nursing students' practice is a significant barrier in the clinical environment (Douglas et al., 2015). Nursing students may thus lack the confidence to practise PAS independently, especially when they are given insufficient time (Douglas et al., 2015). One example is insufficient confidence to practise skills other than the EWS techniques, which are well-integrated in several nursing contexts (Egilsdottir, Byermoen et al., 2019). In addition, the perception that a performed assessment has no impact on patient outcomes is highlighted as a barrier (Douglas et al., 2015). Nursing students also perceive more reliance on technology and others as a barrier to using PAS (Douglas et al., 2015).

In our previous study, we identified several facilitators to increase nursing students' use of physical assessment: for example, being involved in a workplace environment that helps students articulate knowledge using clinical reasoning and clinical judgment (Egilsdottir, Byermoen et al., 2019). Collaboration with peer students, nurses and

preceptors during clinical rotation courses is highlighted as helpful for increasing the use of physical assessment. Moreover, increased physical assessment application could be facilitated by using digital learning resources during clinical rotation, to prompt questions or challenges during PAS performance (Egilsdottir, Byermoen et al., 2019).

To sum up, the studies presented above show that nursing students may encounter barriers to using the full range of learned PAS. Several barriers to and facilitators for using physical assessment have been identified. More research is needed to gain insight into the factors that nursing students consider when performing physical assessments, to better understand their experiences during their learning process. Moreover, more knowledge is needed concerning the impact of the learning environment on nursing students' learning process in the use of physical assessment.

2.2 Newly graduated nurses' readiness to use physical assessment

In general, nursing competence increases with opportunities to practise conceptual and practice skills and gain experience after graduation (Aldosari et al., 2021; Numminen et al., 2017). The literature typically refers to newly graduated nurses (NGNs) in the two first years after graduation, based on Benner's model of development, which refers to being in the continuum from 'novice' to 'advanced beginner' (Benner, 1984, pp. 22-23). Research on readiness for practice shows that entering the work environment as an NGN who is 'ready' depends not only on the knowledge and skills learnt as a student, but also on having the competence to (a) relate to others through communication and collaboration and (b) have an understanding of organizational dynamics (Baumann et al., 2019). Mirza et al. (2019) also describe how having good self-esteem regarding their work is an important aspect of NGNs' practice readiness and professional capacity.

An extensive body of literature reports in the scoping review by Aldosari et al. (2021) that NGNs can have difficulty adjusting to the working environment, as low confidence in their competence and experiencing overwhelming new role responsibilities are

prominent factors. NGNs need to further develop situational awareness to recognize and prevent patient deterioration during the first period of their career (Taylor et al., 2021; Willman et al., 2020). However, NGNs experience greater confidence when they are able to link their daily nursing to their human bioscience knowledge (Montayre et al., 2020). This confidence is related to having an evidence-based decision-making process and being able to speak with conviction during conversations with patients and colleagues (Montayre et al., 2020). Two reviews found that nurses do have adequate knowledge and skills, but lack sufficient confidence in their own competence (Kaldal et al., 2022; Masso et al., 2022). Conditions that are beyond their control when entering the clinical environment – such as heavy workload, colleagues who lack interest in supervising and a lack of support systems – have been identified as reasons why their confidence is affected (Masso et al., 2022).

NGNs report a lack of confidence and preparedness to perform physical assessment upon graduation (Taylor et al., 2021). With time, NGNs' competence in physical assessment develops if they have the opportunity to practise (Duvivier et al., 2014). However, more experience as a nurse does not necessarily increase their use of physical assessment (Cicolini et al., 2015). One example is that not all nurses have the knowledge or vocabulary to articulate clinical changes when reporting information about the patient's deterioration to physicians or other health personnel. The nurses can speak about experiencing an 'uneasy, gut feeling' when observing changes in their patient's condition, but have difficulty defending and articulating possible reasons behind these changes to a physician (Dalton et al., 2018).

Organizational factors are found to be essential for nurses' continuing development of competence in physical assessment after graduation. A collegial atmosphere and novice–expert nurse preceptorships, as well as the presence of physicians and managerial attention help NGNs to feel that they are in a supportive workplace with interprofessional collaboration (Masso et al., 2022). Moreover, collaboration between nursing education and the clinical environment can support the transition to work life

for NGNs (Ehrenberg et al., 2016). There is, however, a need to explore how these factors can fulfil NGNs' need for support.

Prior research indicates that support is a precondition for NGNs to further develop competence in physical assessment. More research that specifically explores how to support NGNs in the clinical environment is warranted – as is how the learning environment influences NGNs' continuing clinical reasoning competence related to physical assessment after graduation. Explorations of how NGNs integrate physical assessment into their daily nursing practice are needed. With the newly introduced feature of nurses' use of physical assessment in Norway, there is a need to explore how NGNs continue to develop their competence in physical assessment after graduation, in order to state the relevance to include physical assessment in nursing education and healthcare more systematically.

2.3 Nurses' use of physical assessment

Numerous studies have explored nurses' physical assessment practice, with a special focus on the use of PAS. Overall, existing studies have concurring findings, in which nurses use about 30 PAS related to general observation and inspection of peripheral, respiratory, abdominal and neurological systems (Birks et al., 2013; Giddens, 2007; Osborne et al., 2015).

Studies exploring nurses use of PAS concurs with findings of nursing students' usage. PAS related to the head, neck, mouth, lips, neck, thorax, breast, back/spine, cardiovascular, musculoskeletal system, abdomen, rectum and anus was rarely or never used (Birks et al., 2013; Giddens, 2007). Moreover, Ciccolini (2015) reports that auscultation skills are never used. Studies indicate that the reasons for nurses' lack of PAS application are often contextual; one such reason is that variations across specialities in the clinical field influence nurses' scope of practice (Cicolini et al., 2015; Osborne et al., 2015; Schroyen et al., 2005). Different clinical specialities on a unit warrant variations in nurses' use of PAS: for example, heart and peripheral assessments

differ between intensive care units and home care (Fennessey, 2016). Perceived insufficient time to practise PAS, where the overall workload influences nurses' ability to perform in-depth physical assessment, is also highlighted (Birks et al., 2013; Douglas et al., 2014). Another barrier involves role ambiguity regarding physical assessment performance, with blurred boundaries around who has the responsibility to perform physical assessment. This includes nurses' experience that their overall physical assessment performance may have limited impact on patients' treatment and care (Douglas et al., 2014; Lesa & Dixon, 2007; Zambas et al., 2016). With increasing aid from technology during assessments, nurses' scope has shifted. As nurses increasingly use technology for patient surveillance, this may limit their involvement in bedside care activities that serve as an initial to in-depth physical assessment modality (Douglas et al., 2014). Indeed, nurses with more experience seem to be placed in more managerial positions, which entail a greater administrative workload and less time for bedside physical assessment (Douglas et al., 2014; Osborne et al., 2015).

Informed to the research presented above, studies find that nurses do not use all PAS learned during education. Several complex reasons for variation in use of PAS are identified, suggesting implications in nursing education. This inspired this dissertation, with the goal of contributing greater insight into nurses' use of physical assessment and how best to support their physical assessment practice.

2.4 Educational approaches to support nursing students' use of physical assessment

Considerable variation in physical assessment curricula have been identified, ranging from 30 to 126 PAS (Egilsdottir, Byermoen et al., 2019; Giddens & Eddy, 2009). Based on the variations in nursing students' and nurses' use of physical assessment, several studies recommend that educational programmes should critically re-evaluate the physical assessment curriculum by reducing the number of PAS (Douglas et al., 2014; Giddens, 2007; Kohtz et al., 2017). Of the 126 skills that are referred to as PAS in nursing

practice, the relevance of including rarely used skills in a nursing curriculum has been questioned: for example, examining the internal eye with an ophthalmoscope (Giddens & Eddy, 2009). Reducing an extensive physical assessment curricula may give nursing students more time to practise select skills in depth (Birks et al., 2013; Giddens, 2007).

Nevertheless, reducing the number of PAS in the physical assessment curriculum has been criticized as inadequate for overcoming the barriers (Douglas et al., 2015; Zambas et al., 2016). It has been suggested that educators need to transform the foci from the use of PAS towards pedagogical approaches that emphasize PAS application using clinical reasoning, reflection and metacognition (Douglas et al., 2015; Zambas et al., 2016). These support others' suggestions to critically review pedagogical strategies, to enable more targeted physical assessment courses (Douglas et al., 2015).

There is a need to support nursing students' learning to use PAS in clinical practice (Douglas et al., 2015). Research has focused on simulation training to enhance nursing students' self-esteem and increase competency (Chen et al., 2015; Tuzer et al., 2016; Wearn et al., 2013). However, little is known about nursing students' learning processes of learning physical assessment in clinical rotations.

Regardless of the above suggestions, few studies had explored or performed pedagogical interventions at the time when this PhD project commenced. Additional insight is needed concerning the various pedagogical perspectives that have been recommended to support nursing students to learn physical assessment (specifically PAS). However, more knowledge is needed regarding how nursing students learn to use and develop competence in physical assessment, both in theoretical and in clinical courses.

3 Conceptual perspectives: Reasoning and judgment processes, transformative learning, and fundamental nursing care

This chapter clarifies the conceptual perspectives relevant to exploring competence in physical assessment in this dissertation. Developing competence in physical assessment includes developing reasoning and judgment processes through transformative learning. In addition, fundamental nursing includes perspectives that are needed to provide fundamental care.

3.1 Clinical reasoning and clinical judgment in physical assessment

Clinical reasoning and clinical judgment are the central concepts of investigation in this dissertation. Clinical reasoning and clinical judgment focus on the processes and strategies to identify cues indicating a change in patients' health situation and provide safe patient care (Levett-Jones et al., 2010). The concepts of 'clinical reasoning' and 'clinical judgment' are complex and multifaceted, and there is a discrepancy concerning how different traditions understand the concepts; and may inform the elusiveness to reach consensus around a universal definition. Consequently, the concepts of 'clinical reasoning', 'clinical judgment', 'clinical decision making', 'problem-solving' and 'critical thinking' are often used interchangeably in nursing literature (Mohammadi - Shahboulaghi et al., 2021).

The common aim of these concepts is to describe the processes and strategies nurses use to understand patient data, as well as to identify and diagnose patient problems. However, they have different definitions and goals for understanding patient care, where they mostly focus on different perspectives in nurses' decision-making process: collecting data, assessing and diagnosing the problem, and planning, implementing and

evaluating (Mohammadi - Shahboulaghi et al., 2021). Several models for nurses' decision-making practice have been proposed, such as Tanner's (2006) Clinical Judgment Model, Levett-Jones et al.'s (2010) Clinical Reasoning Cycle, Tesoro's (2012) Developing Nurses' Thinking, and Caputi's (2020) Model for Teaching Thinking in Nursing. In this dissertation, the Clinical Reasoning Cycle and Clinical Judgment Model are used, as the models depict the complex processes that lie within nurses' decision-making practice.

Effective clinical reasoning in the context of using physical assessment depends upon the nurse's ability to collect the right cues through a targeted PAS application, interpret the information and take the right action for the right patient at the right time and for the right reason(s) (Levett-Jones et al., 2010). This requires not only developing skills in using PAS but also competence in complex thinking processes. In addition, nurses' clinical judgment is based on their reasoning process and refers to their interpretation of 'a patient's needs, concerns, or health problems', followed by a course of action (Tanner, 2006, p.204).

In this dissertation, 'clinical reasoning' is defined as the cognitive process and strategies used to understand patient data, as well as to identify and diagnose patient problems (Levett-Jones et al., 2010). Furthermore, 'clinical judgment' is defined as the cognitive process involved in making judgments to initiate interventions based on the reasoning process (Tanner, 2006).

3.2 Transformative learning

Transformative learning is central in adult learning (Mezirow, 2018, p. 116). Relevant to this dissertation, nursing students are adults, so transformative learning in their educational process aims to enable them to simultaneously reconstruct clusters of patterns or schemes related to their physical assessment performance and competency. Different perspectives within workplace learning (Elkjaer et al., 2021; Jonsson, 2021) are included in this dissertation, due to the considerable amount of time that nursing

students spend in the clinical environment in rotation courses and is the primary workplace NGNs are located after graduation. The concept of scaffolding (Reiser & Tabak, 2014) is also included, due to its pedagogical functioning of supporting students and NGNs' learning. In addition, the three studies included in this dissertation depict different perspectives in the learning environment.

Illeris describes the concept of learning as broad, due to a comprehensive set of processes for learning to occur (Illeris, 2018, p. 2). A person's *individual* knowledge base, understanding and motivation need to be influenced by an *external* process, which includes some sort of action, communication and cooperation (Illeris, 2018, p. 2). These processes will be elaborated on in the discussion chapter, in light of the dissertation's aims: specifically concerning the development of competence in physical assessment through transformative earning in practice.

Transformative learning occurs as individuals cluster and reconstruct different sources of information (Argyris & Schön, 1974, pp. 134-135). Transformative learning theory involves the development of the capacity for abstract thinking and considering perspectives, biases, hypothetical–deductive processes and critical self-reflection, in which one's frame of reference transforms (Mezirow, 2018, p. 116). This includes the metacognitive and communicative reasoning processes of advancing and reassessing reasons that support meanings or beliefs (Mezirow, 2018, p. 118; Winne & Azevedo, 2014, pp. 63, 77). One example is how nursing students make sense of learning to use physical assessment and transform their view of how to integrate it into daily nursing practice.

An additional feature for understanding how knowledge develops and transforms in this dissertation concerns the different learning types that are simultaneously integrated. *Cumulative learning* is characterized by automation, where the learning can only be applied in situations similar to the learned context (Illeris, 2018, p. 7). For example, nursing students who have learned to use all PAS in the simulation centre using a checklist to guide their use may face challenges in applying relevant skills in the clinical

environment, when encountering a patient with abdominal pain. In *assimilative learning*, learners can add new features to their approach related to recalling and applying a scheme in a given context. *Transcendent learning* involves finding places where already-acquired schemes are broken down and transformed so a new situation becomes linked (Illeris, 2018, p. 7).

These learning types can be applied to other learning contexts and can depict how learning occurs (Illeris, 2018, p. 7). In this dissertation, they are relevant because they provide novel insights into what specifically happens in the transformative learning process of developing competence in physical assessment.

Kegan (2018, p. 38) emphasizes the centrality of epistemology in transformative learning, which changes how we know (something). Based on Mezirow's term 'frame of reference', Kegan states that the change in epistemology relates to two processes. The first process is meaning-forming, where the learner shapes a coherent meaning about outer and inner experiences. The second process is constructing one's meaning-forming, which is a metaprocess that affects our meaning-constructing; this includes changes to the very form by which we are making meanings, and in turn changes our epistemology (Kegan, 2018, p. 38). Kegan describes further that learners can move between epistemologies to include more complex capacities, which include key cognitive, interpersonal and intrapersonal features. These complex capacities can take years – or even a lifetime – to develop (Kegan, 2018, pp. 40-41).

The external process that must be present for learning and transformation to occur involve the collaboration a learner has with someone more knowledgeable, where learning is facilitated through shadowing, practising, discussing and reflecting (Reiser & Tabak, 2014, p. 45). A workplace that facilitates social interactions in which dialogue and reflexivity take place enables scaffolding for learning and competence development to occur (Jonsson, 2021, p. 4; Reiser & Tabak, 2014, p. 45). The concept of 'scaffolding' draws on Vygotsky's notion of zone of proximal development in the learning sciences, as described in Reiser and Tabak (2014, p. 46). The zone of proximal development refers

to a range of tasks that are outside of the learners' current independent ability but are achievable with appropriate help, thereby extending their range of independence. The progression model (Figure 2) for learning physical assessment at our university emphasizes scaffolding as a strategy, where the course design and faculty member offers support for students to learn and develop competence in physical assessment (Egilsdottir, Byermoen et al., 2019). The process of scaffolding in the work environment can facilitate knowledge sharing and co-creation through collaboration, resulting in greater workplace efficiency and the provision of competent and safe patient care. (Jonsson, 2021, p. 13). Learning in practice trends towards complexifying, where formal and informal learning transcends talking and thinking and includes interprofessional collaboration (Elkjaer et al., 2021, pp. xii-xiii). Learners can attain both surface and deep learning through collaboration, discussion and reflection (Hattie & Donoghue, 2016). These perspectives will be further detailed in the discussion chapter, when exploring how the clinical work environment influences the further use and development of competence in physical assessment.

3.3 Fundamentals of Care

The Fundamentals of Care Framework (FOCF) is a central theoretical nursing perspective in this dissertation, as it addresses prerequisites for nurses' person-centred fundamental care practice (Kitson et al., 2013).

The FOCF is a framework that takes person-centred care as a point of departure and declares that a therapeutic nurse–patient relationship is central to person-centred care (Kitson et al., 2013). The FOCF emerged in part due to critical reports that nursing has lost its fundamental caring function and discourse that nursing has become more academic and technical (Kitson et al., 2013; Kitson, 2018; McCormack, 2016, pp. 17-18). Egilsdottir et al. (2022) and Egilsdottir et al. (2023), however, report that confidence in using physical assessment is significantly associated with all parts of nursing competence and their ability to provide fundamental care. These perspectives are central to include

in this dissertation, when exploring how competence in physical assessment develops and how this influences nursing students' and nurses' ability to detect changes in patients' health situations and meet their fundamental needs.

Fundamentals of care is a practical point-of-care nursing framework focusing on the routine, every day, physical, psychosocial and relational needs, as illustrated in Figure 3 (Kitson, 2018).

Figure 3: Fundamentals of Care Framework

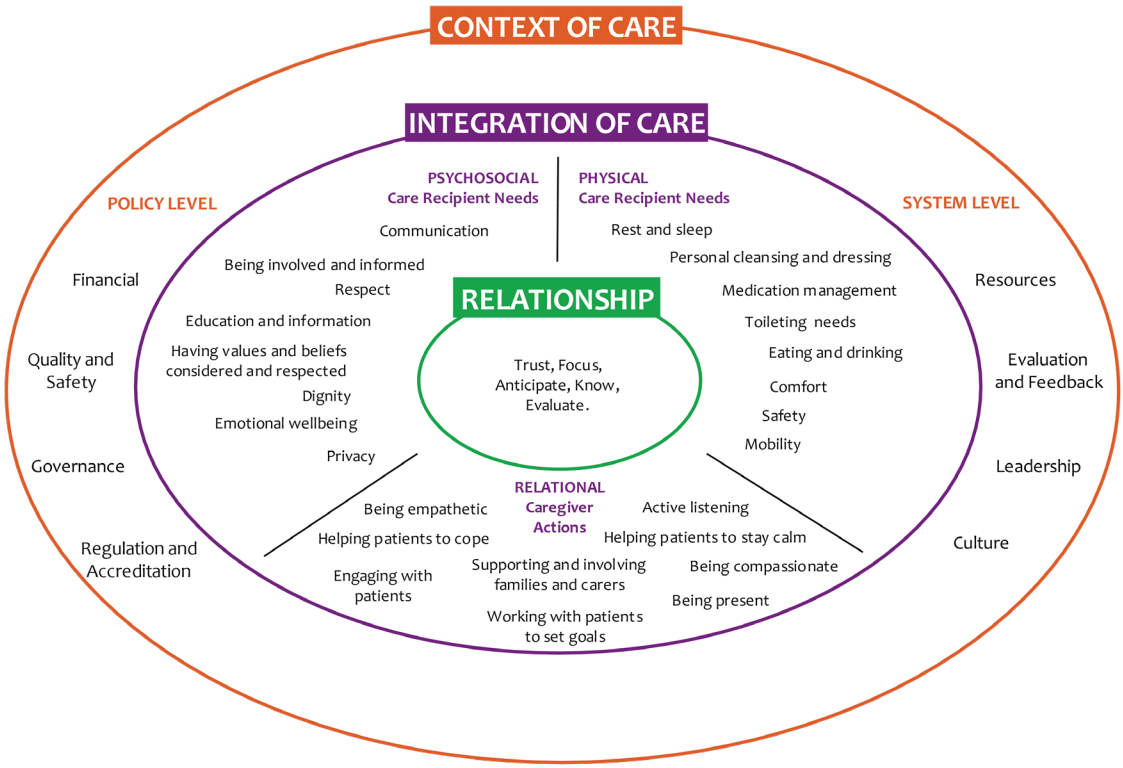


Image obtained from https://ilccare.org/the-framework/

The FOCF is multidimensional and comprises three interrelated dimensions:

(1) In the core dimension, a therapeutic nurse–patient relationship revolves around person-centred approaches related to developing trust with the patient, giving the patient undivided attention, anticipating their needs, knowing enough about the patient to act appropriately and evaluating the quality of the relationship (Kitson, 2018).

(2) The middle dimension emphasizes nurses' integration of care: how patients' individual fundamental care needs – e.g., psychosocial, relational and physical – are addressed. This also includes the importance of the nurse–patient relationship for recognizing and managing complex needs (Kitson, 2018).

(3) The last dimension relates to the context of care: the system and policy requirements needed to support the delivery of fundamental care (Kitson, 2018).

For nurses to establish a nurse–patient relationship and an integration of care, they must have the competence to collect patients' subjective and objective data. This dissertation suggests that physical assessment is a prerequisite for determining patients psychosocial, physical and relational needs. The nurse–patient relationship and conversation is highlighted as key to meeting the patients' needs – and to subsequently understand more of their physical, psychosocial and relational needs as a part of nurses' initial assessments and further interventions (Muntlin, 2021, pp. 86-87). The contribution of the FOCF is important to include in the discussion chapter in this dissertation, when exploring how competence in physical assessment is used and developed. In addition, the FOCF enables new knowledge and perspectives on how physical assessment is a part of fundamental care in nursing.

Including the FOCF in nursing education highlights the reasoning involved in students' decision-making practice in the three interrelated dimensions, as a means of reducing the theory – practice gap and providing person-centred care (Jangland, 2021, pp. 122-

123). In the FOCF, 'high quality' in nursing also entails having time for reflections, in order for students to learn to reason about their own and necessary actions in a given patient situation (Jangland, 2021, p. 130).

The contextual dimension in the FOCF includes factors on the system level, such as leadership, resources, feedback, and culture. These are also factors that the research in chapters 2.1, 2.2 and 2.3 has identified as factors influencing nursing students', NGNs', and nurses' further use of physical assessment.

4 Aim and research questions

Based on the presented research and the need for further insights, the aims of this dissertation are threefold:

- to explore nursing students' use of physical assessment during their clinical rotations in two consecutive rotations in their last educational year (aim 1)
- to explore the development of competence in physical assessment from the last educational year to two years after graduation (aim 2)
- to explore contextual factors facilitating or hindering the use of physical assessment (aim 3)

This dissertation will explore different perspectives of the term 'competence in physical assessment' through three separate studies to answer the overall aims. Table 1 shows how the overall aims of the dissertation are related to the specific studies.

Table 1: Overview of how the overall aims relate to the three studies

	Study 1	Study 2	Study 3
Aim 1	X	X	
Aim 2	X	X	X
Aim 3	X	X	X

Study 1:

The aim was to explore and identify facilitators and barriers in third-year nursing students' process of clinical judgment in relation to physical assessment while in clinical rotation.

Research questions:

1. To what extent do third-year nursing students use B-PAS in patient encounters while in clinical rotation?
2. How does third-year nursing students' judgment influence which physical assessment they perform?

Study 2:

The overall aim was to explore third-year bachelor nursing students' 1) physical assessment practice, and 2) stimulated recall reflections on their competence development.

Research questions:

1. Which physical assessment skills do students apply during patient encounters and why?
2. What do the students experience as important learning environment factors influencing their learning process?
3. Which learning strategies do the students apply during clinical rotation to integrate physical assessment as a routine?

Study 3:

We aimed to explore in-depth nurses use and further development of assessment skills in different nursing contexts the first two years after graduation, and factors that influence the use and development.

5 Methods

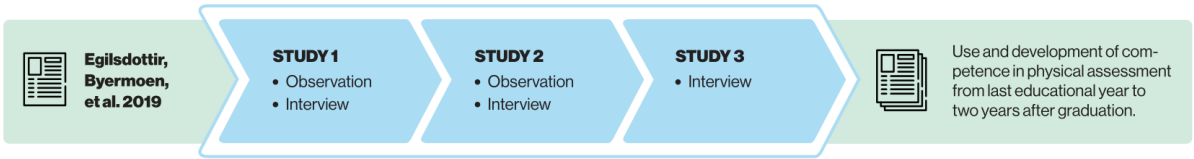
This dissertation is framed within pragmatism, which can be described as a philosophical and epistemological framework for interrogating and evaluating phenomena in terms of their practical functioning (Legg & Hookway, 2021, pp. 18-19). A prominent feature of pragmatism is that it does not stipulate a data collection method, but rather guides the choice of methods that is most appropriate to answer study aims (Dewey, 1938, p. 171). A principle in pragmatic inquiry is that research should originate from the desire to produce useful and actionable knowledge from human experiences (Legg & Hookway, 2021, p. 18). This also includes pragmatism within learning theory, which emphasizes an understanding of human nature and knowledge, both of which are grounded in experience – as presented by Dewey, in Elkjaer (2018, pp. 66-67).

This chapter will present the research design and study setting. The research design will also be presented, followed by a detailed description of the recruitment process, participants, data collection and analysis methods used in the three separate studies. Lastly, ethical perspectives will be outlined.

5.1 Research design

This dissertation had an explorative qualitative design consisting of three studies conducted consecutively and building on earlier research from our previous study (Egilsdottir, Byermoen et al., 2019), as presented in Figure 4.

Figure 4: Explorative qualitative design



Due to the limited focus in the research community and existing literature on how competence in physical assessment develops, an explorative qualitative design following the same participants over time was needed. This design enabled exploration of in-depth aspects not yet emphasized in the empirical literature. The design also provided insights into the participants' individual experiences and transformative learning processes around performing physical assessment as nursing students and as NGNs. Explorative research facilitates the investigation of the full nature of a phenomena, including how it manifests and which factors are related. Qualitative inquiry is well suited to these kinds of explorations, as it enables researchers to explore phenomena in depth (Polit & Beck, 2021, pp. 618-619). Triangulation in data collection methods was used to explore various perspectives related to the dissertation's aims (Polit & Beck, 2021, pp. 572-573). A detailed overview of the dissertations' design, settings, sample, methodology and data analysis methods is presented in Table 2.

Table 2: Overview of the different studies

	Study 1	Study 2	Study 3
Design	An explorative qualitative design	An explorative qualitative design	A phenomenological hermeneutical design
Setting	Home care or Nursing homes	Home care or Nursing homes	Various nursing context
Sample	Ten fifth-semester nursing students Ten patients	Nine students from study 1 in their sixth-semester Eight patients	Eight NGNs (from samples in studies 1 & 2)
Data Collection	October–December 2018	March 2019	March–April 2021
Methods	I: Observation and audio recording of patient encounters, followed by II: SRI*	I: Observation and audio recording of patient encounters, followed by II: SRI*	Individual interviews
Analysis	Analysis of SRI*: Critical incident technique Analysis of patient encounter: Descriptive statics, mean and standard deviation of performed skills and patients' health condition	Analysis of SRI*: Phenomenological hermeneutical analysis Analysis of patient encounter: Evaluation of performed assessment skills and patients' health condition	Phenomenological hermeneutical analysis

**SRI- stimulated recall interviews*

Studies 1 and 2 had explorative qualitative designs using the same types of data collection methods. Observation and audio recording were used during nursing students' use of physical assessment in patient encounters, followed by individual stimulated recall interviews (SRIs), in line with Dempsey (2010). The SRIs drew on the audio recorded patient encounter to facilitate the identification of facilitators and barriers to using physical assessment during clinical rotation. Through this, the nursing students were able to reflect on their actions and why they acted in a particular situation. With the same design, data collection methods and student sample, this study

explored nursing students' development of using physical assessment. The studies were conducted in collaboration with the Drammen municipality (Attachment 1), at rotation sites in one nursing home and one home care district, with the possibility to include 15 students.

Study 3 had an explorative qualitative design. Individual interviews were considered the most appropriate approach, given the study's aim to explore in depth nurses' use and further development of assessment skills in different nursing contexts during the first two years after graduation.

5.2 Recruitment and participants

The participants were the same nursing students (and then nurses, in study 3) throughout the three studies.

5.2.1 Studies 1 and 2

Nursing students: The same process of recruiting nursing students was used for studies 1 and 2 and was based on purposive sampling when inviting third-year nursing students. As the researcher, I informed and invited the third-year nursing students to participate in the studies, by posting written information on the university's web-based learning management system (Attachment 2) and by giving oral information after a lecture. The students were presented with the pre-determined rotation sites that were included in the PhD project. The students were asked to contact the university's clinical rotation coordinator if they wanted to participate in the studies at the rotation sites. The coordinator then informed me about the interested participants. Ten nursing students chose to participate in study 1, and nine of those participated in study 2.

Patients: Recruitment of patients in studies 1 and 2 was based on convenience sampling. The specific inclusion criteria were as follows: before approaching patients, the institutional leaders gave their permission for students and preceptors to approach eligible patients for recruitment. Only patients able to consent to participate were

invited. Preceptors and students considered which patients were eligible and able to consent. Eligible patients received written and oral information about the aim of the study and the data collection method (Attachment 3). Consent forms were signed prior to the data collection.

A total of 18 patients agreed to participate: 10 in study 1 and 8 in study 2. In study 2, one student and one preceptor were unable to recruit a patient.

5.2.2 Study 3

The students who participated in studies 1 and 2 graduated as nurses in June 2019. They were invited to participate in study 3 in February 2021. They received a generic e-mail with written information about the study's aim and a consent form (Attachment 4); they had to respond to the e-mail with an attached signed consent form, in order to participate in the study.

Eight nurses agreed to participate in study 3. One nurse who agreed to participate in the study had declined to participate in studies 1 and 2, but the nurse had been on the same clinical rotation site as the participating students.

5.3 Data collection

5.3.1 Observation and audio recording of the patient encounter

Observations and audio recordings in studies 1 and 2 were used to capture insights into nursing students' actual use of physical assessment during patient encounters. Before the observation in studies 1 and 2, the student provided the researcher with an overview of the patient's diagnosis and health conditions. This enabled an understanding of the patient's health condition during the students' physical assessment performance and the questions in the SRI. During data collection in studies 1 and 2, the students had one patient encounter in the nursing home and in the home care setting.

Prior to the patient encounter, the students were instructed to perform the B-PAS they thought were relevant for the specific patient. All encounters differed in complexity and extent, due to the patients' different medical diagnoses and health conditions. The encounters also differed regarding the nursing students' tasks with the patient as a part of their nursing routines. The encounters could range from only performing physical assessment to combining their assessment with nursing tasks, such as administering medication, helping the patient with compression stockings or personal hygiene, providing wound care or managing meal care. This information was noted on the observation form.

When arriving in a patient room or home, I repeated the study aim to both the patient and student, emphasizing my role as an observer and that I would maintain my distance and not be a part of their interaction. However, I adjusted my proximity when needed, to observe both patient and student from the side or a diagonal view, as illustrated in picture 1.

Picture 1: Nursing student auscultating thoracic wall on a patient

(written permission received from student and patient to use picture as an illustration)

The nursing students performed physical assessment, with a special focus on the B-PAS curriculum, during an encounter observed by me as the researcher. Direct observation made it possible to observe non-verbal communication and interaction (Atkinson, 2015, p. 40). After the patient encounter, the student and I took part in an SRI: an interview in which the student reflected on their own actions while listening to the audio recording. This will be further elaborated in chapter 5.3.2. I was the sole researcher observing and interviewing the students.

Observational notes based on the physical assessment curriculum were taken, to systematically assess which (and how) skills were performed (Attachment 5). Observation notes about the physical assessment curriculum were used to record whether the student performed/did not perform specific B-PAS – or whether it was uncertain as to whether they performed these. All audio recordings from the patient encounters were recorded. The recorder was placed at a suitable distance to record the student and the patient without interfering. The recording was stopped when the student said they were finished with the assessments, and I left the room with the nursing student.

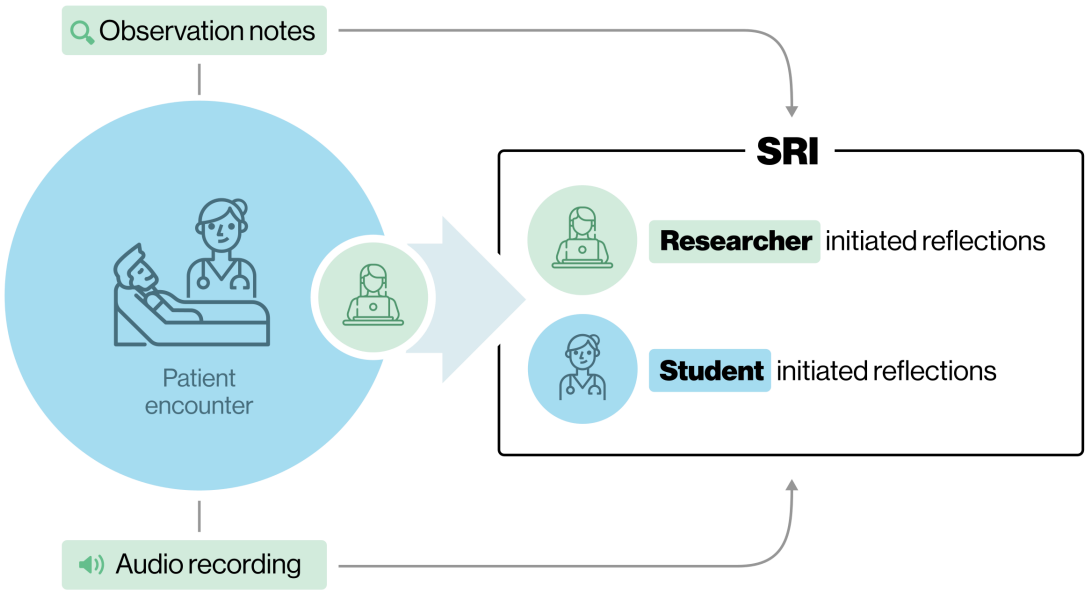
5.3.2 Stimulated recall interview in studies 1 and 2

Shortly after the observed and audio recorded patient encounter, an SRI was conducted. The SRI is a method that is designed to stimulate the interviewee's recall of their behaviour in a specific situation with the aid of an audio or visual recording. The SRI prompts reflections on an event, contextual elements and metaphors (Dempsey, 2010). In this research, the SRI was used to enable in-depth exploration of performing physical assessment from the students' perspective, when they reflected on their own behaviours and addressed how they reflected upon their actions.

A thematic interview guide was developed for the SRIs (Attachment 6), consisting of open-ended questions centring on the following themes: (a) student's perceptions of the use of physical assessment during the encounter, (b) factors influencing the use of physical assessment, and (c) how the students described their clinical judgment in the

decision to perform specific physical assessment in that encounter. Another theme was added in study 2: (d) the students' own experience of their development during their final clinical rotation course. The SRI involved interviewing students while listening to audio recordings of the patient encounter, in which patients' medical diagnosis and health condition were an aspect of what was reflected upon. Figure 5 illustrates the visual model of data collection on which the SRIs were based; it was developed and published as a part of study 2 in this dissertation (Byermoen et al., 2022).

Figure 5: Visual model of data collection



Students were instructed to pause the audio recording whenever they wanted to share their reflections. I also suggested that they pause the recording when significant events occurred in the assessment of the patient that needed further elaboration. The SRIs were audio recorded and were the basis of further analysis.

5.3.3 In-depth interviews

Individual in-depth interviews were used in study 3 to capture NGNs' lived experience in using assessment skills and further development after graduation. Qualitative

interviews entail a social interaction within which knowledge is constructed (Brinkmann & Kvale, 2015, p. 4). The interviews had a conversational form, as described by Fog (2004, p. 18). Fog (2004, p. 11) elaborates how interviews as conversations are a social construction that enables participants to speak more freely about their own experiences and views on a given matter.

A thematic interview guide was developed, based on the findings in the previous studies, in which three main themes were included: (a) workplace environment, (b) patient care requirements and (c) assessment skills (Attachment 7). My sensitivity towards the nurses' wording, pauses and body language (when possible) was critical, in order to capture and explore further turning points in their descriptions. Due to COVID-19 restrictions, all interviews were conducted via the videoconference system Zoom or by telephone, and participating nurses could choose their preferred media. Two nurses chose to use the telephone, whereas the remaining six opted for Zoom.

5.4 Analysis

5.4.1 Critical incident technique

The critical incident technique was used to analyse the SRIs in study 1. The critical incident technique is a systematic and inductive analysis process which aims to explore interactions and behaviours in a given situation (Schluter et al., 2008). This technique enabled exploration of the study aim and research questions, by capturing descriptions of how and why students chose to use specific B-PAS during the patient encounter. A 'critical incident' is defined as an incident which embodies a significant activity (Hughes, 2007, p. 50). An incident is critical if it makes a 'significant' contribution, either positively or negatively, to the general aim of the activity, and it should be capable of being critiqued or analysed'. Critical incident technique can identify similarities, differences or patterns, that can contribute to insight into how and why people engage in a specific

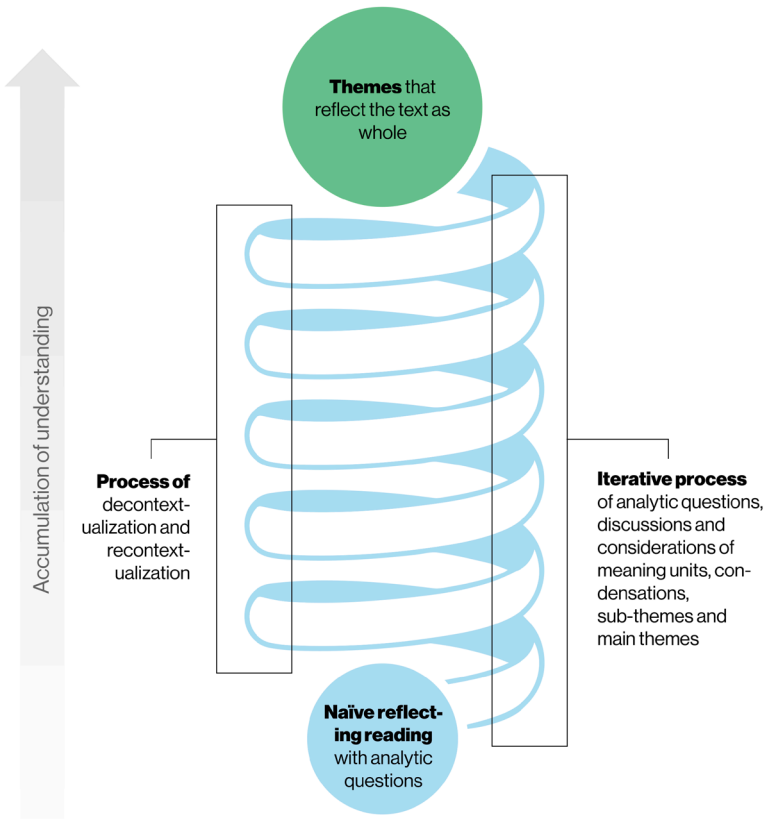
situation (Hughes, 2007, p. 49). The critical incidents in the analysis were defined as students' descriptions of their clinical judgment in their performance.

All audio recordings of the SRIs were transcribed verbatim. All interviews were read several times (by me and the second author) to familiarize and obtain an understanding of the text. All transcripts were imported into the analysis software NVivo 12 Pro (Edhlund & McDougall, 2019). We further coded the data separately and suggested preliminary subcategories and main categories before deciding on the final main categories. Critical incident passages from the data material were arranged into nodes during analysis and classified as various articulations that affected students' clinical judgment. These segments were then combined into subcategories and sorted by similarity. Subcategories were arranged into four final categories in the final stage, which were then combined into two primary sections.

5.4.2 Phenomenological hermeneutical analysis

Phenomenological hermeneutical analysis was used in studies 2 and 3, which aimed to explore the lived experience of the nurses' assessment practice. Phenomenological hermeneutical analysis of the text, as described by Lindseth and Norberg (2004), enables the researcher to obtain a deeper understanding of not only what is said but of the meaning of the experiences. Phenomenological hermeneutical analysis enables understanding and improves healthcare practices – and the meaning we need to reflect on is the meaning we take part in (Lindseth & Norberg, 2004). All audio recordings were transcribed verbatim by me. In the analysis process in studies 2 and 3, myself, the second- and last authors took part in the analysis process. All interviews were read in a naïve and reflective manner, to obtain an impression and understand the meaning of the text as a whole. Figure 6 illustrates this analysis process and was published as a part of study 3 (Byermoen et al., 2023).

Figure 6: Phenomenological hermeneutical analysis process



The initial analysis process included posing analytical questions to the text. The following stages consisted of an iterative process of dividing the text into meaning units, with cycles of repeated reading; processes of decontextualization and recontextualization of the empirical excerpts; and frequent discussions among us who were actively involved in the analysis process. Based on our shared comprehension, the empirical excerpts, meaning units, codes and categories were evaluated numerous times and either validated or refuted. Once the meaning units were deemed to reflect and represent meaning across the data, codes were formed from them, and the main categories were then developed as a final step.

5.4.3 Analysis of the observations

Analysis of the observations in study 1 consisted of descriptive statistics, means and standard deviations to illustrate characteristics of the student sample and the number

of performed PAS. These analyses provided insights into which PAS were used and how often. The relationship between patient diagnosis and PAS that students did not perform during the patient encounter was identified during the observations.

The analysis of students who performed physical assessment in study 2 was based on the researcher's observations and the student's reasoning during the SRI regarding their performed assessment. The evaluation consists of the nursing student's use of physical assessment skills during the encounter: i.e., which assessment skills were performed, how skills were applied and the student's reasoning during the SRI.

5.4.4 Synthesis of main findings

The overall aims of this dissertation guided the synthesizing process. Results from each study were read several times to identify findings concerning each specific aim. When all findings were structured according to each aim, the results were synthesized, to understand how the findings related to each other as a whole. The synthesis process was based on multiple data triangulation (Creswell & Poth, 2018, p. 96), whereby findings from the three separate studies contribute new insights and knowledge concerning (a) how competence in physical assessment develops and (b) how contextual factors influence the use and further development of physical assessment.

5.5 Research ethics

The Norwegian Centre for Research Data (NSD) approved the three studies (Attachments 8–9). Overall, all procedures in the studies were performed in accordance with the Declaration of Helsinki (World Medical Association, 2018). The regional ethic committee in Norway considered the project through a remit assessment, concluding that there was no need for an extended application. All participants in the studies received oral and written information about the aims and implications of participation. All participants provided written consent; they were also given both written and oral

information about confidentiality and the fact that participation was voluntary (and that they could withdraw at any time).

As a part of the NSD's approval, patients were considered as a sample for studies 1 and 2. The considerations were based on the audio recordings, in which the patients' voices were present (in study 1), as were their health conditions and medical diagnoses (in studies 1 and 2 – the latter discussed during the SRIs). Patients were given oral and written information reminding them of their voluntary participation and that all information would be processed in a way that protected their anonymity. Although I was an educated nurse, upon arrival in their home or room, I described my role as an observer to the patients and that I would not interfere during the encounter. As a visual strategy to underline this statement, I chose to wear my personal clothes, rather than a uniform.

During studies 1 and 2, the students knew me primarily as a member of the faculty in the nursing programme. I was highly sensitive to the impact my presence may have had on the students, and I clearly described my role as a PhD candidate. Throughout the studies, the students were given oral and written information reminding them that their participation and performance in the study would not be evaluated as a part of the clinical rotation. The faculty member responsible for the formal evaluation of the students did not discuss the students' performance or reflections with the researchers. All audio recordings were stored in a safe USN folder, to which only the researcher and supervisor had access.

During data collection in study 2, participating students and patients were asked if I could take a photo after the physical assessment encounter, to use as illustrations in this PhD project. If the student agreed, they would ask the patient on my behalf. If the patient agreed, signed consent forms from both patient and student were returned upon my arrival. If the request was rejected, this was not questioned.

6 Main findings of the three studies

In this chapter, the main findings from the three studies will be described. Following this, a synthesis of the results will be presented.

6.1 Study 1

This study found varying use of B-PAS. The nursing students selected which B-PAS to perform based on patients' diagnoses or current clinical condition, as well as prior encounters. Students who used checklists as a tool to remember which skills to use tended to apply more skills that lacked a clear connection to the patient's clinical condition and medical diagnosis. Other students experienced confidence in remembering which skills to use and saw the checklist as a distraction, instead using head-to-toe memorization. When new cues emerged during the patient encounter, few students adapted the assessment approach to include appropriate B-PAS. The students performed mostly B-PAS that were connected to the peripheral, respiratory and gastrointestinal systems. Skills such as auscultation and percussion were described as difficult to perform, as well as to interpret. The students highlighted feeling insecure in trusting their own reasoning process during B-PAS performance: specifically, regarding not knowing which assessments to perform. With this lack of confidence, the students tended to feel insecure in their communication skills and relational competence, which influenced their decision not to perform specific assessments, regardless of what they had indented to do.

The nursing students reported that their use of B-PAS was influenced by three factors:

(1) The context of where the patients were located within the healthcare system (such as a hospital or nursing home) influenced which skills they used; peer–student assessment, role models who had clear expectations that students would apply B-PAS, and different digital learning resources facilitated the use of B-PAS. Identified barriers

to using B-PAS included students' perceived lack of opportunities to practise skills with role models.

(2) The students' prerequisites within knowledge in human bioscience, self-confidence, communication skills and relational competence influenced their B-PAS use.

(3) Another central finding in this study centres on the reasons the students gave for using B-PAS. Students who articulated a rationale based on human bioscience knowledge related to performing B-PAS seemed to have more confidence in their use of skills. Students who were less articulate about their own reasoning process focused on the checklist as a rationale when choosing which B-PAS to perform.

6.2 Study 2

An important change in the nursing students' approach to physical assessment was to initiate all assessments communicating how the patient was feeling and experiencing their current condition. The patients' answers guided the students' next assessment steps. Rather than using all learned PAS, the students determined which assessment to perform based on the patient's concerns and symptoms. The students who could articulate clinical reasoning and refer to prior clinical experiences to select which assessments to use in the observed situation during the SRI showed a more targeted assessment approach.

The students described different key qualities of the learning environment that were essential for their learning process. Experiencing a safe and reflective learning environment where preceptors encouraged them to perform physical assessment, to reflect on and to articulate their findings was important for their further use. Interprofessional collaboration was highly valued, where the nursing students were invited to explore and reflect with other professionals; this could scaffold their skills application and judgment regarding initiating interventions.

Overall, the students experienced having an assessment approach that changed from a checklist- to a symptom-based approach, in which the patients' symptoms determined which skills to use. The need for continuous skills practice was emphasized, to provide an understanding of knowing when and how to perform skills. For instance, nursing students reported that they became more aware of the importance of communication during physical assessments, through hands-on experience.

6.3 Study 3

Study 3 found that the NGNs experienced readiness to commence their further use of assessments skills[1] after graduation, however with a varying degree of trust in their own assessment competence. Communication was emphasized as a crucial component of assessment skills. Communication helped nurses explore the patient's situation through detailed observation, listening and examination, to obtain a holistic understanding of the situation. Moreover, communication enabled the nurses to build trust and collaborate with patients' next of kin.

Recognition from preceptors, nurse managers, colleagues, patients and their next of kin during the education programme had a significant impact on NGNs' use and development of assessment competence. Experiencing recognition through feedback was a facilitator for using and further developing assessment competence. This recognition could lead to a feeling of self-affirmation and help NGNs feel like they were learning while still contributing equally to the patient's care.

The nurses also described how organizational factors that were beyond their control influenced their use and further development. The context of workplace environment influenced which assessment skills were more often used. The workplace culture for

[1] In the published version of study 3, the concept of assessment skills includes physical assessment as well as clinical reasoning and considering appropriate action alternatives.

using assessment skills could either be a facilitator or a barrier to using assessment skills. A heavy workload was often described to be a barrier, as other and more practical tasks needed to be prioritized. Moreover, collaboration with other health professionals influenced NGNs' use of assessment skills, based on their ability to collaborate more effectively.

6.4 Synthesis of the results

Based on the aims of the dissertation, the synthesis of the results from the three studies consists of three topics:

Nursing students' use of physical assessment

The nursing students seemed to develop the use of physical assessment as an integrated part of a holistic nursing approach. Firstly, when the students learned to use physical assessment, they did not use all the assessments they learned in the curriculum (study 1). The students often performed physical assessment based on checklists, on a more technical level, without considering the relevance (study 1). In their last clinical rotation, the students' use of assessments was based on reasoning regarding the patients' current symptoms and expressed concerns, and communication was a central part of their assessments (study 2).

Development of competence in physical assessment

When developing competence in physical assessment, the ability to integrate and cluster various information sources in a reasoning process increased. Initially, the nursing students seemed to use physical assessment as a technical task, with a focus on using learned skills. Their reasoning focused on which skills were used, and this was primarily based on the checklists or head-to-toe memorization (study 1). With more experience, the nursing students were able to cluster more information together and to apply reason regarding their relevance in a specific situation. This included reasoning concerning the relevance of using specific skills with regard to the patient's symptoms (study 2).

Moreover, the reasoning included considerations of their assessments and judgments regarding initiated interventions. This led to an emerging focus on relationship building with the patients, where communication was a central part of the physical assessment approach. In a further step, the NGNs' approach transformed into an internalization of physical assessment as a premise for initiating person-centred fundamental care by integrating a holistic and symptom-based approach in daily nursing practice. Assessment skills were used as a premise for their reasoning and judgment processes in the provision of providing person-centred fundamental care (study 3).

Contextual factors influencing the use of physical assessment

Contextual factors influenced the use and further development of competence in physical assessment. Throughout the three studies, facilitators were identified: nursing students needed scaffolding, both in on-campus learning activities and in the clinical rotation environment**.** Moreover, collaboration with other health professionals in general was reported to be valuable for learning, as it initiated reflections and discussions that could further develop their knowledge – both for nursing students in clinical rotation and later as practising nurses. However, the need for recognition from a supportive environment with preceptors who emphasized the high quality of nurses' assessment practice was central. Recognition enabled nursing students and nurses to practise specific skills, articulate reasoning and judgment processes and integrate physical assessment as a part of nursing competence and nursing routines. However, certain factors were perceived as barriers to applying physical assessment in all studies: Organizational factors, such as a culture's lack of receptivity to using physical assessment, were emphasized. These included a lack of opportunities (and invitations) for nursing students and nurses to practise and use physical assessment. A heavy workload was a barrier for graduated nurses, as other practical tasks had to be prioritized.

7 Discussion

Overall, this dissertation contributes to the growing body of knowledge on how to ensure that nursing student are fit for practice, through an emerging internalization of physical assessment use. The emerging internalization of using physical assessment develops into competence, which is an integrated part of nursing practice as an NGN. Moreover, this dissertation depicts how a workplace environment can scaffold the learning and development of competence in physical assessment.

This chapter first provides a general discussion of the main findings related to the specific research aims, which are discussed through the lens of empirical research and the perspectives of clinical reasoning, clinical judgment, transformative learning and the FOCF. Further, a discussion of the methodologies that are central to this dissertation will be presented.

7.1 General discussion of the main findings

7.1.1 Nursing students' use of physical assessment

The dissertation's finding that the students gradually developed an emerging holistic approach including communication concurs with studies by Douglas et al. (2015) and Zambas et al. (2016). The design and introduction of the progression model (Figure 2) seemed to scaffold the nursing students' use of physical assessment and to support their development of clinical reasoning process. Scaffolding as a teaching and learning activity to foster self-reflection around one's own physical assessment application is described as metacognition (Winne & Azevedo, 2014, p. 63). The articulation of one's own reasoning process in the physical assessment practice during simulation training and in virtual simulation has been found to increase nursing students' human bioscience knowledge and improve their integration of physical assessment application (McDonald et al., 2018). In addition, articulation during physical assessment simulation training enabled nursing students to integrate different areas of knowledge, which again fosters

their reasoning skills (Egilsdottir et al., 2022). This dissertation suggests that nursing students need different learning resources that aim to stimulate reflection and critical thinking in relation to physical assessment application, as they learn clinical reasoning systematically throughout their education; this would enable them to be fit for practice upon graduation.

The findings from this study offer in-depth insights into nursing students' use of physical assessment in their last educational year. The nursing students' approach developed from a checklist and technical task orientation towards the inclusion of reasoning regarding which examination techniques to use. The students grounded their assessments in clinical reasoning processes based on the patients' symptoms and expressed concerns. This transformation in physical assessment approach involved a more targeted physical assessment that emphasized holistic person-centredness. These findings offer new perspectives and challenge the continuing debate concerning the idea that nurses and nursing students' do not use the full range of PAS that they have learned. Studies reporting on nursing students' and nurses' use of physical assessment have mainly focused on the number of PAS used – and not necessarily the reasoning processes informed which skills were used (Birks et al., 2013; Giddens, 2007). This highlights the need for innovative approaches to learning activities that incorporate physical assessment into the educational curriculum, in order to equip students with the necessary competence to determine the appropriate PAS required by the patient encounter or situation. Kagan et al. have (1969) proposed the use of stimulated recall to facilitate training through intrapersonal process recall. This dissertation suggests that including stimulated recall to be introduced as a reflective learning activity related to nursing students' own performance of physical assessment, which was also proposed in study 2. Incorporating reflections on one's own physical assessment performance and relating this to previous experiences and human bioscience knowledge fosters the students' metacognition skills and further transformative learning process.

A recent review suggested to include PAS in relation to the ABCDE assessment approach, to serve as a mnemonic guide for the performance of core assessment skills (Tan et al.,

2021). The use of the ABCDE assessment is a well-integrated practice which can be used in most clinical settings. In Egilsdottir, Byermoen et al. (2019), we report that nursing students used PAS related to the EWS assessment, of a physical assessment curriculum a which included 30 PAS. Interestingly, these findings in addition to the findings in this dissertation indicate that reducing PAS in the curriculum does not necessarily lead to greater PAS use. Based on this dissertation's findings and the empirical literature, there is a need to recognize that the clinical contexts influence the use of physical assessment. Different clinical specialities warrant variations in nurses' use of physical assessment, going beyond the ABCDE or EWS assessment approach. The ABCDE approach is seen as a minimum of core skills which must be supplemented with other skills relevant to various clinical contexts (Osborne et al., 2015). The findings suggest a need to ensure that nursing students acquire adequate competency in physical assessment, which aligns with the overall nursing curriculum and the healthcare context in which they will be practising. This also entails that the clinical work environment must continue to develop nursing students' and nurses' use and practise of relevant PAS in speciality areas.

The findings of this dissertation illustrate that nursing students may lack awareness of cue recognition early in their learning process; this is because they use physical assessment based on checklists, without being able to reason regarding the relevance of the skills in a specific situation. This aligns with Burbach and Thompson (2014), who found in their integrative review that the level of cue recognition and assessment competency is interrelated. Moreover, this dissertation's findings regarding an emerging internalization of physical assessment are supported by findings from Hoffman et al. (2009), who found that more experience enables nursing students to cluster more information sources, which leads to more targeted cue recognition. Here, one example is how students' communication skills became apparent as a vital component of physical assessment in the learning process. The ability to cluster more information sources is linked to the ability to include communication when considering which physical assessment to apply. Nevertheless, though communication has been

acknowledged as a part of physical assessment in educational learning textbooks (Jarvis, 2020, p. 23), nursing research has not yet emphasized this in depth.

7.1.2 Developing competence in physical assessment

The participants who were followed throughout the research project (first as students, then as NGNs) developed the competence to integrate and cluster various information sources in their reasoning process by practising physical assessment. Their development included transformation towards an internalization of physical assessment as a premise for providing person-centred fundamental care by integrating a holistic and symptom-based approach in daily nursing practice. The complex learning process to develop a person-centred fundamental care approach related to the performance of physical assessment can be seen as transformative learning, where one's frame of reference changes (Mezirow, 2018, p. 116). This dissertation shows that the participants moved through different learning types during their transformative learning process. Some students in study 1 took a task-oriented approach, performing physical assessment based on checklists (i.e., on a technical level), rather than considering which skills were appropriate. These findings align with the concept of cumulative learning, describing a learning process where the learner finds it difficult to transform the learned skills in new contexts (Illeris, 2018, p. 7). These students' usage was characterized by automation and difficulty using the skills in different settings than the learned context – they thus did not have the reasoning competence to consider why specific skills were applied or to identify new cues when this occurred. Similar findings have been reported when nursing students consider cues separately, without combining the relevance of cues in relation to each other (Burbach & Thompson, 2014).

Students who took an emerging approach memorized the skills to use by applying a head-to-toe approach, without necessarily having the experience and vocabulary to articulate their own reasoning process to use specific physical assessment. This can be seen as assimilative learning, where a learner adds new features to the learned skills (Illeris, 2018, p. 7). The students were able to add new features to their assessment approach by recalling and applying them in a given context. It can be challenging to

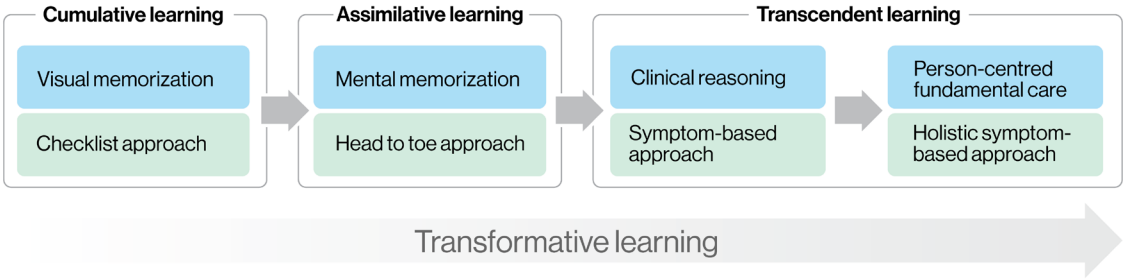
perform physical assessment without having the experience or ability to interconnect relevant skills with human bioscience knowledge in a new clinical setting. This may also inform findings showing that students often apply more PAS than the situation requires or do not recognise new cues that emerge in a patient situation, as they lack experiences on which they can draw (Duvivier et al., 2014; Hoffman et al., 2009).

In the further learning process, students in study 2 were in a better position to articulate their reasoning and judgment processes regarding why they chose to perform a specific physical assessment than in study 1. This can be seen as transcendent learning, where already acquired knowledge is broken down and linked to new situations (Illeris, 2018, p. 7). The nursing students used prior experiences and linked their acquired competence in physical assessment to new clinical settings. This meant that more experience and competence enabled students to cluster more complex information, with more targeted use of assessments techniques and cue recognition (Burbach & Thompson, 2014). At this point, the students described previous experiences of reasoning processes based on human bioscience knowledge. This was characterized by a more symptom-based approach, in which the students conversed with the patient, and through this could determine which PAS to use. The importance of relationship building and communicating with patients emerged as a key feature of students' assessment approach. A well-functioning student–patient relationship enabled the internalization of relevant assessment skills through a reasoning and judgment process.

After graduation, the nurses seemed to internalize assessment skills as a part of a holistic and symptom-based approach, emphasizing person-centred fundamental care. This additional feature added insight into the nurses' use of physical assessment as a premise for providing fundamental care. This was an apparent shift that characterized the process of transformative learning, in which the nurses' frame of what physical assessment entails changed (Mezirow, 2018, p. 116).

The types of learning through which the students moved, offer novel insights into their learning processes, specifically related to learning to use and develop competence in physical assessment, as illustrated in the proposed model in Figure 7.

Figure 7: Process of learning to use physical assessment



Kegan emphasizes that transformative learning can take years, or even a lifetime (Kegan, 2018, pp. 40-41). A critique of this dissertation's findings may be how a period of approximately two and a half years (from data collection in study 1 to data collection in study 3) can qualify this change as a transformation. Study 3 findings suggest that the nurses' development aligned with Benner's classification of advanced beginner stage (two) in the taxonomy 'From Novice to Expert', which classifies stage one as novice and stage five as an expert (Benner, 1984, pp. 22-32). The critique could also include the possibility of identifying transformative learning until stage five. However, Kegan stresses that the 'form' that transforms is not the years of experience: rather, it is how one's epistemology of cognitive, interpersonal and intrapersonal key features transforms – or undergoes an epistemological shift (Kegan, 2018, p. 42).

The participants' physical assessment scheme as a checklist- and technical task-based approach transformed into an approach in which physical assessment is a premise for providing person-centred fundamental care in daily nursing. The participants were able to cluster and use several information sources simultaneously. Kegan proposes 'five increasingly complex epistemologies' (Kegan, 2018, p. 41). The participants in this dissertation shifted from an epistemology that included concrete perspectives and simple reciprocity towards an epistemology in which physical assessment was used in a way that involved abstractions through hypothesis thinking, increased focus and awareness of oneself and one's role. Some participants developed even further, into a self-authoring mind that emphasizes self-regulation and self-formation in the use of physical assessment.

The participants transferred between the proposed steps in Figure 7 at different paces during the studies, and not all were identified in the last step in the model by the end of study 3. As described by Illeris (2018, p. 2), there are both individual and external reasons that may explain the various learning process. In the next section, 7.1.3, external influencing factors, such as the workplace environment, will be discussed.

The novel insight into how competence in physical assessment develops within a person-centred fundamental care perspective that is integrated into daily nursing challenges the common understanding of physical assessment as primarily a technical task (Kitson, 2018). Our findings provide insights into when physical assessment may be considered a part of fundamental care processes and when it may not. Study 3 questioned Kitson's (2018) statement that technical tasks compromise holistic care, by suggesting that mastering various assessment skills promotes person-centred fundamental care. The nurse gives undivided attention to the patient through the focused use of physical assessment based on the patient's needs and symptoms. Yet, findings in study 1 illustrate that the students had low confidence in using physical assessment, which reduced the quality of the nurse–patient relationship and integration of care in the performed assessments. These findings concur with Egilsdottir et al. (2022) and Egilsdottir et al. (2023), who identified that nursing students' experience of their own competent use of physical assessment was a part of nursing competency. Moreover, NGNs' confidence related to their own human bioscience knowledge, influencing their relationship with patients and their ability to provide compassionate care (Montayre et al., 2020). These findings highlight the importance of integrating human bioscience and fundamental nursing knowledge, particularly in the context of physical assessment. Educational programmes should focus on emphasizing and scaffolding nursing students' ability to integrate these areas closely.

7.1.3 The workplace environment is the key to learning

The synthesis in this dissertation highlighted how the clinical environment is a key influencing factor for learning to use physical assessment in practice, as well as for the continuing development of competency in this area. Our findings provide new insights with regards to the Context of Care in different nursing contexts, as the FOCF literature has mainly focused on acute care settings (Kitson, 2018). Culture is highlighted as a part of the system level in the FOCF, where a workplace's value basis is considered a prerequisite to providing person-centred fundamental care (Muntlin & Jangland, 2021, p. 68).

In this dissertation, workplace culture was found to be the most important perceived influencing factor in the use of physical assessment. With 50% of nursing students' education occurring in clinical rotation courses, it is expected that the culture of the clinical rotation sites will influence their physical assessment practice. An organizational culture that clearly emphasizes high-quality nursing care by using various assessments was described as a facilitator of increased use of physical assessment. This finding is supported by earlier research that found that collaboration and permission influence the use of physical assessment (Edmunds et al., 2010). Being part of an organizational culture that encourages the use of physical assessment, provides opportunities to articulate and reflect on one's own performance of assessments, reasoning, and judgment processes. This supports how communication, reflection and feedback enable learning in a workplace environment (Jonsson, 2021, p. 4). This is also a premise in the FOCF (on the system level), for nurses to be able to provide fundamental care, where feedback and evaluation are central concepts related to that care (Kitson, 2018). Through conversations about patients' care, the participants could reflect on their own actions and reasoning processes (Taylor et al., 2021; Tower et al., 2019); these conversations could then lead to knowledge sharing and learning, as described by Elkjaer et al. (2021, pp. xii-xiii) – and, in addition, challenge the participants' points of reference and thus enable transformative learning (Mezirow, 2018, p. 116).

One barrier frequently reported by the participants was the lack of opportunities to reflect on and discuss issues related to physical assessment with others. Preceptors or colleagues who lacked competence in physical assessment did not initiate or encourage these reflections and discussions. Two possible explanations are suggested: (1) preceptors and colleagues failed to engage in meaningful discussions due to their competency level; or (2) the participants avoided reflections because physical assessment is not encouraged within the workplace environment. Participants who were able to find colleagues or preceptors willing to engage in these conversations often found physicians to be the most receptive, as they could discuss patients' treatment and care with them. Physicians were viewed as valuable partners for initiating reflective practice, including hypothesis-driven discussions, as they were seen as more 'knowledgeable others', as described by Reiser and Tabak (2014, p. 45). The lack of a supportive workplace environment for using physical assessment was a barrier to refining and transforming assessment approaches. Physical assessment was perceived as irrelevant at their current workplace and as something additional to ordinary nursing tasks. These findings are not new, as other studies also report on how workplace barriers negatively influence the integration of assessment skills (Douglas et al., 2015). The findings do, however, offer a novel contribution, as they illustrate the crucial importance of a supportive learning environment for developing competence in physical assessment. Nursing students and NGNs need supportive environments to maintain and further develop clinical reasoning and judgment skills in new and unfamiliar clinical settings (Song & McCreary, 2020).

Regardless of the introduction of physical assessment into USN's nursing curriculum 2015 (Egilsdottir, Byermoen et al., 2019), the findings from this PhD project highlight the continuing challenges to include this newly acquired aspect of nursing practice into the clinical work environment. This dissertation suggests that a more systematic introduction of a practice education facilitator could help overcome some of the barriers faced by nursing students in practising physical assessment. A practice education facilitator provides guidance and support to both nursing students and clinical supervisors in the clinical environment and acts as a liaison between the educational

institution and the clinical rotation sites (Scott et al., 2017). However, there are influential circumstances in a workplace environment that are beyond educators', students' and NGNs' control, such as the workplace's receptivity towards supporting students and NGNs (Masso et al., 2022). Given their limited ability to influence the workplace environment, educators need to support students through the pedagogical learning strategies on campus. When designing learning activities for clinical rotation courses, it is important to facilitate students' confidence in integrating physical assessment into their daily nursing practice. Collaboration between students can reduce barriers to using physical assessment. The nursing students in studies 1 and 2 reported that engaging in reflective practices with their peers was valuable for using and further developing their physical assessment skills, as they shared a common understanding of physical assessment. A similar finding was reported by Schams et al. (2020), who found that collaboration between nursing students and advanced practice nursing students increased their confidence in learning from and teaching each other.

When there is a lack of role models, mobile learning has been shown to support skills training and knowledge transfer in nursing students' physical assessment practice during clinical rotations (Egilsdottir et al., 2021; Egilsdottir et al., 2023). This calls for educational programmes that emphasize physical assessment by integrating learning activities that include facilitating factors. This involves closely integrating human bioscience and nursing knowledge throughout students' education, with faculty facilitating hypothesis-driven assignments as a part of students' reflective practice; for example, students could be asked to articulate their physical assessment, reasoning and judgment processes as an integrated part of nursing and human bioscience knowledge, both in theoretical courses and during simulation training.

In addition to practising the application of skills in simulation centres on campus, students also need to integrate reflective practice during simulation training and consider physical assessment application based on symptoms and reasoning processes. New and innovative learning activities have been explored to identify arenas in which faculty can integrate these perspectives. For example, service learning as a preclinical

simulation setting involving real patients in a safe learning environment enables nursing students to integrate patient care and critical reasoning (Mumba et al., 2022). This kind of integration may help students to have a more accelerated development approach, where physical assessment is no longer perceived as an additional task but as a part of a holistic assessment approach during patient encounters.

With an increasing number of nurses graduating with competency in physical assessment, one might expect its natural implementation in nursing practice. Nevertheless, our findings illustrate potential current and future barriers to the implementation of physical assessment in nursing practice. Without competent supervision and support in the clinical environment, the competence to use physical assessment will be lost (as reported in study 3). In addition, the findings also highlight how a workplace's cultural characteristics can influence nurses' use of physical assessment; these characteristics include receptivity towards using or the invitation to use physical assessment on a unit. Although Norwegian nursing education regulations have changed to emphasize the importance of nurses' use of systematic observations (Kunnskapsdepartementet, 2019), these regulations have not yet been fully implemented in the clinical environment. Furthermore, this dissertation proposes that physical assessment be explicitly included in the education regulations, so that all Norwegian educational institutions systematically incorporate it into their curriculum. By doing so, Norway may better meet its future healthcare demands: specifically, the sharing of responsibilities to provide the right expertise at the right time in the right context, as called for in the white paper, 'Time for Action' (NOU 23:4, p 132).

In the clinical environment, nurse managers are key to developing a supportive workplace environment that includes formal and informal learning, when innovations are implemented (Elkjaer et al., 2021, pp. xii-xiii). This dissertation highlights the need for nurse managers to support nurses in using various assessment skills that exceed the use of EWS assessments. Moreover, nurse managers represent stakeholders located on the system level within the FOCF, in the introduction and maintenance of person-centred fundamental care on a unit (Muntlin & Jangland, 2021, p. 65). Nevertheless,

nurse managers require support for their leadership in creating clear strategies to achieve these goals (Mudd et al., 2022). To further implement nurses' use of physical assessment and thus enhance patient safety in the interprofessional team, this dissertation suggests that there is a need to include nurses' use of physical assessment on a policy level. One example in Norwegian healthcare is the implementation of a nationally regulated EWS assessment. This strategy supported managerial leaders' decision to implement learning programmes and cultivate a culture that encourages the articulation and use of the EWS assessment. Today, the EWS assessment is widely integrated into nurses' assessments in most parts of the Norwegian healthcare system (Helsedirektoratet, 2020).

7.2 Methodological discussion

In this section, a methodological discussion will be presented. This section is organized with the same structure as chapter five, discussing design, sample, data collection and analysis. Lastly, a final reflection on my experiences of performing a PhD project will be presented.

Guba and Lincoln's work on strategies to identify and address potential threats related to trustworthiness are used as a framework for discussions and reflections, to provide transparency around the quality enhancement strategies we used (Guba & Lincoln, 1994; Lincoln & Guba, 1985). Guba and Lincoln propose five dimensions of trustworthiness: credibility (the true value of data and interpretations), dependability (reliability), confirmability (objectivity), transferability (applicability) and authenticity (faithfully showing the range of realities) (Guba & Lincoln, 1994; Lincoln & Guba, 1985).

7.2.1 Design

Pragmatic inquiry informed the use of an explorative qualitative design in this dissertation. This decision was based on three perspectives, as described by Kelly and Cordeiro (2020): (a) producing actionable knowledge, (b) exploring the

interconnectedness of experience, knowing and acting, and (c) performing a research inquiry as an experiential process (Kelly & Cordeiro, 2020).

A strength of this dissertation is the use of pragmatic inquiry through a qualitative approach. The aim was to contribute with useful and actionable knowledge which would have practical implications in education and in the clinical environment. Prior research constituted the basis for the dissertation's aims and the decision to apply a qualitative approach. A qualitative explorative design allows for many possibilities regarding the study designs, as described by Polit and Beck (2021, p. 55). The use of participants' experiences and their clinical contexts from one study informed the design and aims of the subsequent study. When planning this PhD project, we reviewed the existing literature and our previous study (Egilsdottir, Byermoen et al., 2019), finding a discrepancy in the literature concerning nursing students' use of physical assessment. The self-report surveys used by prior studies focused on the specific use of PAS, not on the reasoning processes that lie within the decision to use specific skills. To provide new contributions to the research field thus required exploration of the phenomena through different qualitative designs. This is in line with how the design of inquiry approaches enables exploration of experience, knowing and acting, as described by Kelly and Cordeiro (2020). Additionally, the experiential research process informed the subsequent study designs, aims and interview guides based on the previous study findings.

Pragmatic inquiry offers the flexibility to apply a dynamic design, methods and procedures that can best capture the overall aim of a study (Creswell & Poth, 2018, pp. 26-27). Nevertheless, pragmatism has been criticized for involving an insufficient use of theory, as a research design that uses a 'what works best' approach (Hesse-Biber, 2015). This is considered as more of a strength in this dissertation, however. Pragmatic inquiry's flexibility has been central to this research when exploring un(der)explored perspectives in developing competence in physical assessment.

7.2.2 Sample

In qualitative studies, the relationship between sample size, data saturation and depth of information must be considered, when deciding about the optimal number of participants (Creswell & Poth, 2018, p. 158). In this dissertation, it is a strength that the same students were followed through 2½ years, starting with 10 students in study 1, of whom 9 participated in study 2 and 8 in study 3.

When students applied for the rotation placement, they were informed that a research project would be being conducted. A purposive sampling recruitment process targeted third year nursing students in a class cohort, where they could volunteer to participate. A sampling strategy may have led to recruiting students who were particularly interested in the study, and thus reduced the credibility of the collected information. The recruitment process can potentially reduce the trustworthiness of the findings. However, we considered these factors to be a strength, as they enabled investigation of how the students used physical assessment and any influencing factors (i.e., the study aims). We needed to recruit students who were willing to participate over time if we were to follow their development in-depth.

Following the same participants over a longer period of time was considered central to having prolonged engagement with them, thus providing in-depth data and ensuring credibility and authenticity. However, not all participants participated from study 1 to study 3. Lincoln and Guba (1985, p. 304) and Malterud et al. (2016) described that it is the richness of information that provides data saturation and information power. By having the majority of the same participants in the three studies, we believe that the in-depth data collection methods provided sufficiently rich information about the participants' experiences of learning to use physical assessment.

7.2.3 Data collection

In this section, I will closely reflect on the data collection methods used in the research. As dependability, transferability and authenticity enhance trustworthiness (Guba &

Lincoln, 1994, p.114), it is important to provide transparency concerning my own considerations and actions as the sole researcher collecting the data.

Observation and audio recording: Using a combination of data collection methods enables insight into new and un(der)explored perspectives (Creswell & Poth, 2018, p. 96). The combination of observations and SRIs was considered the best method to capture the actual performance of nursing students' physical assessment. Their perspectives and experiences would not have been discovered with the use of only one of these two data collection methods. It can be discussed as to whether a video recording could have replaced the researcher and the audio recording, to reduce potential student reactivity. However, my direct observation was considered necessary, as several assessments are not communicated verbally and thus would have remained undetected during the SRI. Moreover, my presence during the patient encounter enabled me to adjust my position when the student's or patient's body blocked the view.

The observation strategy used was passive participation, as described by Spradley (1980, p. 59), which includes being present but not interacting with the student or patient. It was important that I was present during the encounter, to gain insight into the content and dynamics of what happened in the room during the encounter. This gives information about what happened when the student entered a patient's living environment, or what happened when other healthcare personnel interrupted the student during an assessment. My presence may have led to reactivity – i.e., the student and patient may have altered their performance and behaviour – and thus influenced the study results' credibility and transferability. To mitigate any impact from my presence, as suggested by Corbin and Morse (2003), I moved to a different part of the room when any form of emotional distress from the student or patient was sensed.

Stimulated recall interview: Themes discussed in the SRIs in studies 1 and 2 were mainly based on the specific encounter and provided rich data with which to answer the studies' aims. When topics of interest appeared, the recording would be stopped for questions and reflections between the student and researcher. As the observer during

the encounters, it was important that I also conducted the interview. Moreover, possessing the ability to request relevant information to facilitate quality dialogue, as described by Malterud et al. (2016), enhanced the quality of the discourse and information power.

Imbalanced power relationships during interviews require researcher attention. There is the potential for the interviewee to experience emotional distress and experience a lack of control during an interview (Corbin & Morse, 2003; Karnieli-Miller et al., 2009). As a result, during an SRI, the interviewee may not necessarily initiate a reflection, if they feel that they lack control over the situation (Busse & Ferri, 2005). To mitigate this, I needed to be aware of the imbalanced power relationship between me and the student. To overcome the imbalanced relationship, I carefully considered the students' experiences, especially when they were asked to articulate and reflect upon their own skills application and reasoning. I also built rapport, used careful wording and attended to my own and the students' body language to reduce discomfort, as these preventive measures have been suggested by Guillemin and Heggen (2008). I worked to achieve a relationship with the students that was based on mutual trust and a joint effort to create new knowledge. This was approached not by assessing the students' overall competence in physical assessment, but rather emphasizing their thoughts about and experiences of learning to use physical assessment. I was mindful of my own subjectivity, and that the students' performance that guided the questions would not necessarily reflect what they regarded as important. Studies 1 and 2 consisted of my probing and encouraging student of my observations or if my questions being asked were understood during the SRI while listening to the audio recordings and reflecting on their performance. In studies 1 and 2, I encouraged students to share their observations, to ensure that they understood the questions I asked during the SRI, while we listened to the audio recordings, and they reflected on their performance. The students were asked and motivated to stop the audio recordings when they wanted to reflect upon a topic. This meant that I needed to be highly aware of their body language and facial

expressions if topics emerged, stop the recording, and explicitly ask about their thoughts.

In-depth interview: When conducting the interviews in study 3, I already had a relationship with the nurses being interviewed, built on our shared experiences from their education and participation in the prior studies. During the Zoom and telephone interviews, it was important to maintain critical reflexivity in case participants experienced emotional distress. A challenge here, however, was not having physical proximity. Despite being unable to meet the nurses in person, it was important to reflect on both the advantages and disadvantages of having visual and/or auditory records, as described by Irani (2019). Due to the inability to observe the nurses' body language during telephone interviews, extra effort was placed on establishing good rapport and actively listening to the nurses' pauses, wording and tone of voice during conversations; this was necessary to identify significant topics to explore in greater depth. Nevertheless, it was challenging to determine whether pauses marked the end of a description or were simply indicated a pause, as the participant was thinking. Based on the nurses' and researcher's prior acquaintance from the education programme and previous studies, the nurses did not appear to be adversely affected by using the digital solution. In fact, they were forthcoming in discussing both professional and personal matters. It was also easier to read their body language when seeing them face to face. However, using Zoom did create challenges when there was an occasional lag in the Wi-Fi connection; in these instances, some questions and answers needed to be rephrased before the conversation could be continued. Despite the limitations of conducting unstructured interviews via a conference system, the quality of the conversations was satisfactory in relation to the study aims. Irani (2019) describes the type of data or the need for contextual data to influence the relevance if the use of a conference system is applicable as a data collection method. With the NGNs' own experiences of using and developing competence being discussed, the data were considered satisfactory in terms of the data collection method applied.

Combination of data collection methods: Upon critical reflection of the data collection methods used in Studies 1 and 2, it is possible that the use of observation and SRIs may be perceived as lacking authenticity, as it is the participants who must voice their interpretations during an SRI (Busse & Ferri, 2003). Busse and Ferri (2003) also suggest that it is possible for participants to consider more factors during a task than they later express; this means that researchers may not obtain a complete understanding of the participants' actual experience. A similar concern may be raised regarding the potential contribution of this dissertation's findings regarding new insights into competence development through the combination of observations and SRIs. Thus, the actual use of combination of data collection methods enabled access into the students' reasoning and judgment processes, which would not have been possible through an interview only. And using only observation would have constrained the possibility of exploring the students' reasoning and judgment processes. An alternative data collection method could have been the thinking-aloud approach, where participants articulate their actions while performing tasks. However, Busse and Ferri (2003) report that this methodology can result in distraction from the task being performed.

It is also important to highlight how the validity of the NGNs' own articulated experiences in study 3 can contribute to the overall aims of this dissertation, particularly given that the NGNs' assessment practices were not observed. Having thick descriptions of the NGNs' own learning processes, when retrospectively reflecting on their education, increases the credibility of the results in studies 1 and 2. The credibility of the NGNs' descriptions of their own assessment approaches in their daily nursing is strengthened by the fact that they work in various clinical contexts. Observations could also have been used as a data collection method in study 3, but this would have generated entirely different data. Additionally, due to the current COVID-19 restrictions when study 3 was conducted, this approach would have been very demanding to carry out.

The strength of this dissertation lies in how the use of various data collection methods enabled the exploration of how competence develops over an extended period. Rather

than focusing on task performance, the various data collection methods emphasized the processes of clinical reasoning and clinical judgment. Without the combination of qualitative observations and interviews, the perspective that physical assessment includes more than simply using all learned PAS would not have been identified. The triangulation of data collection methods, as presented by Denzin (1989, p. 313), to explore a phenomenon from multiple sources (a) enhances the trustworthiness of the design and (b) helps to overcome any potential bias that may arise from using a single data collection method. This is in line with how multiple sources can offer deeper insight when analysing data (Creswell & Poth, 2018, p. 96).

7.2.4 Analysis

To ensure trustworthiness when analysing and interpreting data, it is central to demonstrate credibility when reporting data in the analysis process, dependability and confirmability of the data interpretations (Guba & Lincoln, 1994, p.114).

Critical incident technique: When conducting the critical incident technique as an analysis method, it is important that the researcher performing the analysis focus on the defined critical incidents being analysed. Subtle changes in a participant's story may include more than one experience; these thus require careful attention from the researcher (Sharoff, 2008). It is further recommended that the researcher conducting the analysis be familiar with the setting of the subject under study, to enhance the validity of the analysis process – but this researcher should still be a part of an analysis team (Butterfield et al., 2005; Sharoff, 2008). To ensure trustworthiness during this analysis process, I – as a skilled educator with competence in physical assessment – performed the analysis. However, it was crucial that I was a part of an analysis team and have frequent discussions with the rest of my research team related to the analysis and findings.

Phenomenological hermeneutical analysis: When conducting a phenomenological hermeneutical analysis, the researcher's preunderstanding needs to be revised; without this step, essential meanings in the text cannot be grasped. As Lindseth and Norberg

(2004) describe, there is the need to be critical towards one's own preunderstanding may be superficial or inappropriate. Performing this analysis method as a novice was challenging, and it was crucial for me to be a part of an analysis team comprising experts on this method. This also enhanced trustworthiness during the qualitative analysis process. Revising not only my own preunderstanding, but also being part of an analysis team that questioned our preconceptions, balanced our intersubjective interpretations during the analysis of the studies and writing of the corresponding articles. This triangulation of analysis team, in which several researchers in the analysis process are contributed to enhance provide trustworthiness of the findings (Lincoln & Guba, 1985; Malterud et al., 2016).

7.2.5 Final reflections on conducting a PhD project

I can see that I have developed as a researcher, when writing this dissertation and reflecting on the three studies that I have conducted. I have been in a fortunate position to undertake a PhD project using various data collection methods and analysis approaches. It has also been somewhat challenging to acquire new skills as a novice researcher. With prior experience in quantitative methods, it was somewhat intimidating to base a PhD project entirely on the complex use of qualitative methods, which required another sense of presence in the data material.

I cannot help but to draw parallels between the learning processes of transformative learning that I have read and written so much about and my own process of becoming a researcher. One might say that I have had an epistemological shift in my own transformative learning process. I can see that I have been concerned with strictly following rules and guidelines in the various data collection or analysis methods, to ensure transparency and trustworthiness. This might have made it more challenging and time-consuming, when it was not intuitive as to how to concretely apply these rules or guidelines to my project. However, for learning to occur, an external process – such as collaboration – must be present: For me, this was my research group.

Throughout this PhD project, I have been part of a research team whose members have diverse backgrounds in nursing science, communication, health services research, ethics and educational studies. In addition, I have collaborated closely with a colleague and fellow PhD candidate. Having a highly competent team of supervisors and colleagues who have supported and guided me to understand and make the methodology applicable to my project has been instructive. However, there is also a balance concerning how to include the research team's feedback and recommendations, as well as findings from my fellow PhD candidate's studies, while still taking independent decisions as a researcher. I believe that this is an important learning activity for a PhD candidate – to articulate and take a well-considered position based on feedback and recommendations.

Undertaking a PhD project on my own educational practice, where I also is a part of the faculty has been rewarding, especially being able to report my findings in the studies, in close collaboration with my fellow PhD candidate: We have made a novel contribution, highlighting the need for research-based education and learning activities.

8 Conclusion

To our knowledge, this is the first study exploring in-depth aspects related to developing competence in physical assessment, from the last year of nursing education to two years after graduation. This dissertation, in combination with each individual study, gives new insights into how competence in physical assessment develops, involving a complex process that transforms one's view of what physical assessment is and how it can become an integrated part of daily nursing.

The main finding of this dissertation is that the nursing students and NGNs are fit for practice related to their competence in physical assessment. Through their education, nursing students have developed the competence to include clinical reasoning and communication as a basis from which to decide which PAS to use. The participants had an emerging reasoning process, shifting from a checklist and task orientation to a holistic assessment, basing their assessment approach on the patients' concerns and current medical and health situation. With the increasing integration of physical assessment into daily nursing, participants displayed an emerging judgment process of initiating interventions based on their reasoning processes. This pattern of development led to the conclusion that a holistic physical assessment approach is an integrated part of person-centred fundamental care. However, both students and NGNs require a supportive learning and working environment that scaffolds their continuing practise around using physical assessment in new contexts, to support further competence development.

Based on the findings in this dissertation, there is a need to further enhance the curriculum and develop pedagogical learning activities throughout nursing students' education. The progression model (Figure 2) must include a more systemized use of scaffolding related to nursing students' clinical reasoning and judgment processes when practising the use of PAS. One suggested learning activity is the use of audio or video recordings of students' own performance during physical assessment, along with reflective practice processes, thus reducing the theory–practice gap.

With the new insights from this dissertation, courses in the use of physical assessment and pedagogical approaches are needed for precepting nurses from the clinical environment and for faculty members. This includes a focus on how nurses and faculty members, based on their competence in physical assessment, can (a) support nursing students to use clinical reasoning to elicit which assessments to perform and (b) scaffold a reflective practice on their performed assessments with a pedagogical approach. As the findings depict, there is a need for closer collaboration between higher education and the clinical environment in supporting nursing students' use of physical assessment. In line with the recent Norwegian white paper (NOU 2023:4, p. 132), action is required to prepare nurses to be fit for practice in future healthcare in Norway.

8.1 Implications for education and clinical practice

Regardless of the emphasis on a physical assessment curriculum in nursing education, the findings suggest that there is a need to provide nursing students with physical assessment courses emphasizing clinical reasoning and judgments. Here, there are several implications. This includes integrating physical assessment related to clinical reasoning and clinical judgment processes in all aspects of nursing, in theoretical, simulation and clinical courses. One suggestion is to implement physical assessment learning simulation activities that closely integrate human biosciences and nursing throughout the education programme. This consists of faculty giving students hypothesis-driven assignments that have a reflective practice, in which the articulation of physical assessment and judgment processes is integrated. Fostering reflections on their own assessment can provide nursing students with metacognitive learning activities. This includes integrating reflective practice during simulation training and considering the application of assessment skills based on a symptom-based approach, clinical reasoning and judgment processes. This integration may support students to take an even more symptom-based assessment approach – it may also enhance their

confidence when closing the gap between what they learn on campus and the clinical context and overcoming barriers to using physical assessment during clinical rotation.

It can be challenging for educators to influence clinical rotation sites' receptivity towards supporting nursing students' use of physical assessment and scaffolding reflections. There is a need for faculty who support students through pedagogical learning strategies on campus and implement compulsory learning activities related to the physical assessment that students must perform during clinical rotation courses. The findings in this dissertation suggest new pedagogical learning activities. At our university, we have further developed our progression model by introducing a closer integration of clinical reasoning and clinical judgment in relation to physical assessment skills training and simulation on campus. The nursing students have both physical and virtual simulation training as learning activities, emphasizing hypothesis-driven reflections and discussions on reasoning processes. In addition to theoretical nursing courses, we have included virtual patient cases for closer integration of human bioscience and physical assessment knowledge in the nursing process, to reduce the theory-practice gap.

In clinical practice, nurse managers are pivotal for creating a safe learning environment for both students and nurses in their continuing development. As physical assessment is still not fully integrated in daily nursing competence in Norwegian healthcare, nurse managers play a crucial role in creating an environment that emphasizes high-quality nursing practice by promoting the use of physical assessment.

As discussed in section 7.1.1, nursing education needs to teach physical assessment that mirrors nurses' general practice. However, the findings also indicate that educational institutions and healthcare services need to have a closer collaboration to scaffold nursing students' and NGNs' further use and development of competence in physical assessment. Related to nursing education regulations, Norwegian Directory of Health guidelines highlight that precepting nurses must have continuing precepting courses with a minimum of 10 ECTS at a master's level (Helsedirektoratet, 2021, p. 8). This provides the opportunity for closer collaboration between the clinical environment and educational institution to develop new strategies for precepting nursing students.

A mutual understanding of how to support the use and development of physical assessment would close the theory–practice gap, as well as make the transformation from student to NGN less challenging. The workplace environment's receptivity to supporting students and NGNs would benefit from collaboration around educating registered nurses to include physical assessment in their nursing practice.

8.2 Final remarks and future research

The results presented in this dissertation can be used for further research on the development of competence in physical assessment in nursing practice. This dissertation provides new insights into how competence in physical assessment develops over time; it also highlights the need to support physical assessment use and development. However, further research is needed that explores the influence of different clinical contexts, learning environments and the roles of precepting nurses and nurse managers.

The findings further indicate that educational programmes can benefit from implementing physical assessment courses that emphasize clinical reasoning processes. However, there is a need for research that explores the learning outcomes of and learning satisfaction from these suggestions – both in on-campus activities and during clinical rotation. In addition, explorations of the relationship between implementing new learning activities and further development after graduation is needed.

The explorative research design reveals new perspectives that require further exploration. Given the current state of the research literature when this PhD project commenced, we sought new insights concerning the discussions regarding physical assessment in nursing. Our qualitative explorations offer new perspectives that physical assessment is not merely the use of PAS, but is a part of nurses' holistic care. This is a new starting point for future research on introducing and evaluating suggested learning activities and teaching strategies in both theoretical and clinical courses.

The Norwegian white paper 'Time for Action' (NOU 2023:4) predicts the need for shared tasks and responsibilities between health personnel in the health services. The findings in this dissertation may contribute with recommendations on how to meet the criteria in the report: specifically, on how to enable healthcare personnel to be fit for practice, given the competence needed for future healthcare demands. There will also be a need for future research that explores how nurses' use of physical assessment influences their care, when physical assessment becomes more common in nursing. Moreover, studies will need to explore and identify the specific tasks that can be shared between nurses and other health personnel, such as advanced practice nurses, physicians and assistant health personnel. It is, however, crucial to acknowledge the potential barriers of reduced receptivity towards including physical assessment as a premise of providing holistic fundamental care. This potential challenge may lead to physical assessment as a technical task – and hence compromise patients' holistic care.

Overall, the results provide new insights into (a) how physical assessment is used and developed and (b) the influencing factors. Researchers, educators, nurse managers, nurses and nursing students may benefit from the findings in this dissertation, as they provide a new understanding of how competence in physical assessment is learned.

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Study 1

Byermoen, K. R., Brembo, E. A., Egilsdottir, H. Ö., Heyn, L. G., Moen, A., & Eide, H. (2021). Reflection on actions: Identifying facilitators of and barriers to using physical assessment in clinical practice. *Nurse Education in Practice*, *50*, 102913. https://doi.org/10.1111/jan.15631

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Reflection on actions: Identifying facilitators of and barriers to using physical assessment in clinical practice

Kirsten Røland Byermoen [a,*,1], Espen Andreas Brembo [a], H. Ösp Egilsdottir [a], Lena Günterberg Heyn [a], Anne Moen [b], Hilde Eide [a]

[a] Science Centre Health and Technology, Faculty of Health and Social Sciences, University of South-Eastern Norway, Grønland 58, 3045, Drammen, Norway
[b] University of Oslo, Institute for Health and Society, Faculty of Medicine, Nedre Ullevål 9, 0850, Oslo, Norway

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ABSTRACT

Current research suggests that nursing students do not apply all sets of physical assessment skills (PAS) learned in their nursing education. The aim of this study was to evaluate third-year nursing students' process of clinical judgment using PAS in clinical rotation. Specific focus was on how the process of clinical judgment affected when the nursing students performed physical assessment, and which types of knowledge were implied in their practice. Ten nursing students performed PAS independently while in clinical rotation; these performances were audiotaped and observed. Shortly after, individual semi-structured stimulated recall interviews (SRI) took place. Regardless of the nursing students' stated level of PAS utilization, self-efficacy or scientific knowledge, clinical judgment was primarily based on contextual factors and personal prerequisites. This study contributes to in-depth knowledge about how nursing students perform physical assessment, how they describe their clinical judgment process and their strategies towards systematically and confidently using PAS. We conclude the paper with pedagogical strategies and learning activities that can facilitate reflection-in-action and reflection-on-action.

1. Introduction

Clinical skills acquisition is a fundamental component of undergraduate nursing education and lack of this competence can compromise patient safety and care (Zambas et al., 2016). Several studies indicate that inexperienced Registered Nurses (RNs) struggle to process large amounts of complex data (Levett-Jones et al., 2010; Gillespie and Paterson, 2009). Anticipating changes in patients' situations can be challenging when the complexity increases, as can differentiating between clinical situations needing immediate attention and those that are less acute (Price et al., 2017).

Physical assessment and health assessment are some of the core competencies in undergraduate nursing education forming the basis of RNs preparedness for demanding patient encounters (Laurant et al., 2018). Incorporating knowledge from human bioscience (anatomy, physiology, pathology, pathophysiology and pharmacology) is a prerequisite when assessing and interpreting data (Craft et al., 2013; Jensen et al., 2018). Hence, nursing education institutions must teach nursing students how to integrate their knowledge of human bioscience into clinical judgment and decision-making processes during patient encounters (Hoffman et al., 2009; Douglas et al., 2015).

Successfully integrating physical assessment subjects in the undergraduate nursing curriculum remains challenging (Douglas et al., 2015). This might explain why nursing students and newly graduated RNs do not perform all of the Physical Assessment Skills (PAS) learned during their education (Egilsdottir et al., 2019; Douglas et al., 2015; Cicolini et al., 2015; Birks et al., 2013). Recent studies show that the main barriers are the pedagogical methods used in their training, as well as the clinical contexts in which students perform these skills (Douglas et al., 2015; Egilsdottir et al., 2019; Zambas et al., 2016). Literature on students' clinical judgment of physical assessment while in clinical rotation is limited. This needs further exploration, as contextual setting in clinical rotation profoundly impacts students' use of PAS in detection of cues or deterioration in the patients' health situation (Osborne et al., 2015; Craft et al., 2013; Gerry et al., 2017; Odell et al., 2009).

Additional barriers to RNs' performance of physical assessment have

* Corresponding author. University of South-Eastern Norway, Grønland 58, 3045, Drammen, Norway.
E-mail addresses: kirsten.roland.byermoen@usn.no (K.R. Byermoen), espen.andreas.brembo@usn.no (E.A. Brembo), osp.egilsdottir@usn.no (H.Ö. Egilsdottir), lena.heyn@usn.no (L.G. Heyn), anne.moen@medisin.uio.no (A. Moen), hilde.eide@usn.no (H. Eide).
[1] Present/permanent address: Kirsten Røland Byermoen, Grønland 58, 3045 Drammen, Norway.

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been identified, including lack of role models, lack of confidence, and doubts about the utility of the assessments (Douglas et al., 2015); however, student's development of PAS has not yet been explored to understand why they do not perform the skills they have learned. Thus, improved understanding as to what influences students in their physical assessment performance, but also which clinical judgment processes students act upon is needed.

Students need to be able to initiate a clinical judgment process to perform adequate physical assessment (Burbach and Thompson, 2014). Clinical judgment is described as an ongoing problem-solving activity, and includes as circular process of interpreting patient's needs, concerns, and health problems; deciding to take action; and using or modifying standard approaches appropriate to the patient's response (Tanner, 2006). The final stage is reflection-on-action: reflecting on clinical findings used to inform future clinical judgments. Reflection-on-action involves what students learn from the experience, and contributes to the development of their competence in clinical judgment. It is salient to explore what actually happens when students perform PAS in real patient encounters, and to further understand what students act upon (and why) in the clinical judgment process (Burbach and Thompson, 2014; Levett-Jones et al., 2010).

PAS are taught in a three-year undergraduate nursing programme at a Norwegian university. PAS considered to be basic competencies for bachelor's degree students at the university are referred to as basic PAS (B-PAS) in the curriculum shown in Table 1. Students are instructed in the use of B-PAS curriculum during their first year and learn to use these sets of skills to scaffold their B-PAS development throughout their nursing education (Egilsdottir et al., 2019). B-PAS are integrated in courses such as human bioscience, theoretical nursing (Basic Care Nursing and Critical Care Nursing), practical skills learning in labs and during clinical rotation (General Nursing Care, Surgical/Medical Nursing and Community Health Care Nursing). Throughout these courses, students practise B-PAS based on a progression model (Appendix A). Learning activities emphasize theoretical foci, clinical on-campus simulation and digital simulation with virtual patients, and provide effective arenas for learning and mastering practical skills. By linking the assessment with human bioscience knowledge through different modes of simulation training, the students are provided with guidance and support whilst becoming confident and proactive in their nursing.

Table 1
Overview curriculum Basic Physical Assessment Skills (B-PAS).

Organ system	B-PAS curricula
Heart and peripheral circulatory system	Inspect extremities for skin colour/hair growth
	Palpate distal pulses
	Count pulses
	Palpate for edema
	Palpate and inspect capillary refill
	Estimate skin fold
	Evaluate extremities for skin sensation
	Assess fine motor skills
	Take blood pressure
	Auscultate heart sounds
	Auscultate carotid artery
Respiratory system	Inspect thorax for shape, breathing effort
	Inspect thorax for skin colour/scar
	Palpate thorax wall for thoracic expansion and vocal fremitus
	Percuss the lungs
	Auscultate lungs
	Assess SpO_2*
Abdominal system	Inspect abdomen
	Auscultate abdomen for bowel sounds
	Abdominal palpation
	Percuss the abdomen
	Percuss for kidney tenderness
Neurological system	Evaluate mental status
	Evaluate CN I-XII**
	Evaluate muscle strength, atrophy, tone
	Evaluate sensation of touch
	Assess coordination and balance
	Evaluate patella and plantar reflexes

*SpO_2- Blood oxygen level.
**CNI-XII- Cranial Nerves Number 1–12.

1.1. Aim

The overall aim of this paper is to explore and identify facilitators and barriers in third-year nursing students' process of clinical judgment in relation to physical assessment while in clinical rotation. We seek to answer the following research questions:

1. To what extent do third-year nursing students use B-PAS in patient encounters while in clinical rotation?
2. How does third-year nursing students' judgment influence which physical assessments they perform?

This paper is part of a larger research project exploring the implementation of physical assessment in clinical rotation to enhance clinical competence and patient safety in Norwegian nursing education.

2. Method

2.1. Design

The study used an explorative qualitative design, and used two data collection methods to explore the aim of the study (Table 2): a) observation and audio-recording nursing students in a patient situation, followed by b) stimulated recall interviews based on the audio-recorded patient interaction.

2.2. Data collection

2.2.1. Sample and setting

Between October and December 2018, ten nursing students in their fifth semester and from one campus participated in the study during their clinical rotation period in community health care. Fifteen students who had their clinical rotation placement in a pre-defined nursing home and home care site were invited to contact the clinical rotation coordinator if they were interested in taking part in the study. After receiving detailed oral and written information, 10 students agreed to participate. Ten patients also agreed to participate, and signed the consent form before the researcher was introduced. Data collection was conducted in week seven or eight of the clinical rotation period (a total of 8 weeks/240 h rotation period). This was the first of the students' two clinical rotation periods in a community health care.

2.2.2. Observation and audio-recording of students in a clinical situation

The first author (KRB) observed and audio-recorded the students' use of B-PAS in a clinical situation, focusing on the physical assessment of a patient; students could use checklists of learned B-PAS (Appendix B) if they so desired. Structured observational notes based on the B-PAS curriculum (Table 1) were taken to assess systematically which (and how) skills were performed. Direct observation by the researcher was considered necessary, as several assessments are not communicated verbally and thus would be undetected during the SRI. The researcher explained to both patient and student that her role was that of a non-participating observer. However, the researcher's presence as an observer may have affected the nursing student and patient, their interaction and the student's use of the B-PAS. If emotional distress from the student or patient was observed during the encounter, the researcher continued observing from a different part of the room to mitigate any impact of her presence (Corbin and Morse, 2003; Creswell and Poth, 2018). Moreover, the researcher did not wear a uniform during the

Table 2
Data collection method.

	Data collection methods	
	Clinical situation	Stimulated Recall Interview
Student focus	Performing B-PAS*	Reflection on action
Research focus	Observation notes Audiotaping	a) Nursing students' perceptions about the use of B-PAS* in clinical situation. b) Factors influencing Nursing students B-PAS* performance. c) How Nursing students described their clinical judgment in their decision to use B-PAS* in that situation.

*Basic Physical Assessment Skills.

clinical situation, to delineate her role as an observer rather than a health care provider.

2.2.3. Individual stimulated recall interview (SRI)

KRB conducted an individual SRI with each student after the clinical situation to ensure immediate recall. The interviews lasted between 5 and 20 min, took place in a private room and were audio-recorded. While the students situated at nursing homes were able to participate in the SRI shortly after the observation, the home care students had to wait until they had returned to a suitable interview location.

Using the SRI as a methodology during students' clinical practice allowed us to reliably assess students' behaviours, and to address how they reflected upon their own actions while performing physical assessments. The SRI involved interviewing students while listening to audio-recordings of the clinical situation. Students were instructed to pause the audio-recording whenever they felt like sharing their reflections. The researcher suggested pausing the recording when significant events occurred that needed further elaboration. The student or researcher would stop to reflect on concurrent thinking during the clinical situation (Shubert and Meredith, 2015). As a data collection method, the SRI targeted reflections upon the actual incident, contextual elements, and metaphors students used when they spoke about different incidents. Furthermore, the SRI enabled in-depth exploration of the event from the students' perspective (Dempsey, 2010). The interview guide with open-ended questions included the following themes: a) students' perceptions about the use of B-PAS in clinical situations, b) factors influencing their B-PAS performance, and c) how they described their clinical judgment in their decision to use B-PAS in that situation.

The researchers' awareness about the imbalanced power relationship between student and researcher is crucial (Karnieli-Miller et al., 2009). Students' comfort can be challenged when asked to reflect upon their own actions, knowledge and skills, and may feel unsure how to articulate these (Corbin and Morse, 2003; Karnieli-Miller et al., 2009). The researcher was aware of these factors, and worked to build rapport, use careful wording, and attend to own and the students' body language to reduce discomfort (Butterfield et al., 2005; Guillemin and Heggen, 2008). To reduce the risk of observer bias, students were explicitly encouraged to correct the researcher while listening to the audio-recording and reflecting on their performance during the SRI.

2.3. Research ethics

The Norwegian Centre for Research Data (NSD) (Project No. 196758) approved the study. All involved municipalities and institutional leaders approved the study. Eligible patients received written and oral information from the students and their preceptor about the aim of the study and data collection method (i.e. direct observation supplemented with audio-recordings). Students were instructed to only invite patients able to consent to participation, and the focus of data collection was on the student's performance of PAS. We did not collect data from the patients.

As the first author is a member of the faculty at the university and had met the students in that role, the students were informed that she had no influence on the formal evaluation of the clinical rotation course. The faculty member responsible for the formal evaluation of the students during the rotation did not discuss their performance with the researcher.

2.4. Data analysis

2.4.1. Analysis of stimulated recall interview (SRI)

The analysis of each SRI was based on the critical incident technique (CIT). CIT is a systematic, inductive process of analysis that aims to explore human interactions and behaviour in a clearly defined situation (Schluter et al., 2008). Here, the focus is not on a specific 'critical incident', but rather on several incidents that represent a significant activity (Hughes, 2007). This approach can highlight similarities, differences and patterns that provide insight into how and why people engage in a given situation (Hughes, 2007; Kain, 2004). CIT offers a clearly defined and sequential analytical process for handling several sequences of activities, and is thus well-suited to analysing students' reflections on their use of B-PAS and their performance of physical assessment.

Audio-recordings of the SRI were transcribed verbatim. Two researchers (KRB and EAB) independently read through all transcribed interviews several times to become familiar with the data, which were then analysed inductively using NVivo 12 Pro (Edhlund and McDougall, 2019). The critical incidents were defined as students' descriptions of their clinical judgment in their performance of physical assessment. KRB and EAB coded the data separately and suggested preliminary subcategories and main categories before deciding on the final main categories. All authors were involved throughout the analysis to ensure a trustworthy process and that the critical incidents were not over-analysed (Butterfield et al., 2005; Hughes, 2007). Table 3 shows the analytical process from excerpts to main areas. Excerpts of empirical data containing critical incidents were organized into nodes and categorized as different articulations that impacted students' clinical judgment. These segments were then sorted according to similarities and merged into subcategories. In the final stage, subcategories were organized into four final categories and then merged into two main areas (Table 3).

Table 3
Analysis process from empiric statement to main area.

Empiric statements	Node	Subcategory	Category	Main area
It is difficult to distinguish between scales of sound. Because, with bowel sounds, you can say it is bubbling, right? You can describe it with more words. With auscultation on the lungs, you have to say where on the scale, how "dull" it is. Is it very dull, just a bit dull, or not dull at all, right?	Percussion is difficult	How to interpret the assessments	The theoretical knowledge embedded in practical performance	Adequate and master patient assessment

Table 4
Characteristics of the sample and use of Basic Physical Assessment Skills (B-PAS).

Background information	Age range*	Health related work experience prior education start (years)	Health-related work experience during education (shifts/ week)	Number of B-PAS used in clinical setting (N = 44)	Time used in clinical situation (minutes)	Using checklist under clinical situation	Number of critical incidents articulated during SRI	SRI time (minutes)
Mean	32,7 years	2,6 years	1,3 shifts/week	17,7 B-PAS	27,2 min.	–	37,7	54min
Standard Deviation	9,57 years	2,7 years	1,8 shifts/week	8,99 B-PAS	15,77 min.	–	12,3	20min
Student 1	3	0	0	18	53	yes	38	51
Student 2	2	5	2	15	22	yes	53	57
Student 3	3	0	0	8	20	no	28	37
Student 4	1	6	2,5	20	12	no	32	41
Student 5	1	0	2	20	38	yes	51	101
Student 6	1	6	2,5	32	38	yes	44	65
Student 7	3	0,5	0	30	36	yes	43	57
Student 8	1	0	2,5	2	7	no	13	29
Student 9	2	0	0	18	36	yes	46	60
Student 10	1	2,5	2	14	10	no	29	42

Age range: 1:23-30 years old, 2:31-40 years old, 3: 41–50 years old.

2.4.2. Analysis of clinical situation

Analysis of the clinical situation were based on descriptive statistics: means and standard deviations (SD) illustrate characteristics of the sample and the number of performed B-PAS, as illustrated in Table 4.

3. Results

3.1. Characteristics of the sample

Ten students with an average age of 33 years (ranging from 23 to 50 years of age) participated. Consistent with the university's general demographics, two participants were male and eight female, and three did not have Norwegian as their native language (Table 4). Half the participants had worked in a health-related context before beginning the nursing programme; six were working as health care providers during their education.

3.2. Use of B-PAS in the patient situation

The students' use of the B-PAS varied, but they typically applied more skills if checklists were used. The reason students gave for using checklists was to enhance their confidence in their appliance when they could have glance at the checklist, and therefore experience better confidence. The students who saw these lists as a distraction in their assessments felt confident that they could remember which skills to perform.

Four main categories were identified from the SRI as factors influencing the students' use of B-PAS. The number of critical incidents the student reflected on influenced the length of the SRI. An overview is shown in Table 5 and will be elaborated on below.

3.3. Performance of skills

Most students performed B-PAS based on the patients' diagnosis or current health status (Table 6). However, some students tended to select more skills than required when collecting data, rather than adapting their approach based on the patients' current status. In addition, when new cues emerged during the clinical situation, only some of the students adapted their approach with adequate skills (Table 7). Few students were able to perform relevant assessments that had no clear connection to the peripheral, respiratory and gastrointestinal system (e.g., percussion for kidney tenderness and neurological assessment). However, evaluation of mental status in conversation was prioritized as an integrated part of neurological assessments. Inspection of the patient when talking, walking and moving around, based on former encounter (s) with the patient, was also given priority.

Students emphasized that assessments like the auscultation of heart and lungs, and the percussion of abdomen and thorax, were difficult to perform and interpret correctly. Still, most of the students performed these skills in the clinical situation (Table 6). Students explained that their concerns were related to determining whether their performed assessments were correct and how the anatomical or pathological mechanisms causing specific sounds should be interpreted.

Table 5
Factors influencing performance of physical assessment.

Subcategories	Categories	Main area
Skills that I think is difficult to perform Skills that I need more practice on What can I do to become better Skills that I applied	Performance of skills	Adequate mastery of patient assessment.
I am insecure about my own knowledge I am not always sure when it is appropriate to perform B-PAS* How I interpret the assessments When I discover something new	The theoretical knowledge embedded in practical performance	
Knowing my patient well My cooperation with the patient My communication with the patient	The patient encounter	Contextual factors that influence the patient meeting and assessment
What my assessments can result into My role models	How to work with B-PAS* in clinical rotation	

*B-PAS- Basic Physical Assessment Skills.

Table 6
Nursing students' use of Basic Physical Assessment Skills (B-PAS) with the patient.

B-PAS curricula	Skills applied by students (N = 10)
Heart and peripheral circulation	
Inspection extremities for skin color/hair growth	9
Palpate distal pulses	8
Palpate for edema	9
Palpate and inspect capillary refill	8
Estimate skin fold	4
Assess pain sensation	8
Evaluate extremities for skin sensation	1
Assess fine motor skills	1
Take blood pressure	7
Auscultate heart sounds	6
Auscultate carotid artery	5
Thorax	
Inspect thorax for shape, breathing effort, respiratory rate	9
Inspect thorax for skin color/scar	6
Palpate thorax wall for thoracic expansion and vocal fremitus	2
Lung percussion	3
Lung auscultation	7
Assess SpO_2*	6
Abdomen	
Inspect abdomen	9
Auscultate abdomen for bowel sounds	5
Abdominal palpation	6
Abdominal percussion	1
Percuss for kidney tenderness	3
Neurology	
Mental status	
AVPU, GCS, alternative MMSE***, Delirium	9
*Evaluate CN I-XII***	
II: Optic	2
III: Oculomotor	4
IV og VI: Trochlear, Abducent	2
VIII: Acoustic	3
V: Trigeminal	2
VII: Facial	4
IX: Glossopharyngeal	2
XII: Hypoglossal	3
Evaluate muscle strength, atrophy, tone	
Muscle atrophy	4
Muscle tone	2
Muscle strength in the arms	5
Muscle strength in the legs	6
Evaluate sensation of touch	
Sensation of touch under feet	1
Sensation of position	1
Assess coordination and balance	
Index finger-nose tip test	1
Rapidly alternating movements	1
Heels and knee test	0
Romberg test	0
Walking test	2
Evaluate patella and plantar reflexes	
Plantar reflex	0
Patella reflex	0

*SpO_2- Blood oxygen level.
**CNI-XII- Cranial Nerves Number 1–12.
***AVPU- alert, verbal, pain, unresponsive, GCS- Glascow Coma Scale, MMSE-Mini-Mental State Examination.

> 'It is difficult to distinguish between types of sound. With bowel sounds, you can say it is bubbling, right? You can describe it with more words. With auscultation of the lungs, you have to say where on the scale, how 'dull' it is. Is it very dull, just a bit dull, or not dull at all? It is a bit difficult for me to describe it. This is something I realize I have to practise more'. (S4)

The students articulated clear ideas for strategies that could be used to stimulate better skills performance and improve their ability to interpret sounds. Increased focus on B-PAS related to organ systems during the campus simulation and learning lab was highlighted, as well as improved access to digital learning resources. These strategies were typically connected to the auscultation and percussion of both anatomical and pathological character.

> 'I did an online course. That was a good one. I could hear mechanical valves, aortic stenosis, and sounds. So, when I auscultated a patient that I knew had a mechanical valve and aortic stenosis, I thought I heard a bit more pronounced sound on lub and not on the dub …. I have also used YouTube to listen to the different sounds, just to check what I heard was right'. (S2)

Having the opportunity to practise B-PAS in clinical rotation with real patients and real diseases was also highly valued, as was receiving guidance during their practice that confirmed their interpretation of the sounds they heard.

3.4. The theoretical knowledge embedded in practical performance

Students expressed uncertainty about trusting their own reasoning regarding human bioscience knowledge in relation to using B-PAS correctly during the clinical situation. Several students stated that it was difficult to select appropriate skills and know how to interpret the data; they worried that this might to cause them to forget relevant assessments, use a 'checklist approach', or simply perform skills based on other nurses' preference.

During the simulation on campus, the students learned which assessments are appropriate for each organ system, and how and when to perform these. However, a salient challenge is to transform and integrate theoretical human bioscience knowledge into practice based on reasoning's of why. Those students who were able to articulate *why*—in relation to their use of knowledge of human bioscience and of B-PAS—appeared to have confidence in their own theoretical knowledge. Students who articulated a specific rationale based on their human bioscience knowledge for why they performed specific assessments were also more confident in their use of other assessments (such as performing Early Warning Score (EWS) assessments).

> 'I chose not to palpate the abdomen. Because, when I auscultated abdomen, the four quadrants, everything was normal, not too much sound, not too little. If he was a new patient on the ward, or said he had abdominal pain, or hadn't had any faeces or gas air in a long time, then I would have done it. If I had auscultated, and didn't hear anything, or a very high pitch sound, abnormal sounds, then I would have assessed more'. (S7)

The students' ability to integrate their knowledge of human bioscience into their clinical judgment process thus enabled them to perform a specific assessment based on new cues or hypothesis thinking.

3.5. The patient encounter

The students primarily based their clinical judgment on their knowledge about the patient during the clinical situation. They described prior interaction with the patient and knowledge of their specific health situation, diagnosis and pharmacology as facilitating factors in their use of skills.

> 'I compare every time I meet him with the things I have assessed before. It is always a natural part of my focus when coming to a patient. I shake his hand and I can feel that he has the same strength as before. He walks like he used to, it's all normal. He is alert, awake, remembers me. There are no signs that indicate that I should do a neurological assessment'. (S9)

Personal factors—such as self-confidence, relational competence and communication skills—also influenced students' B-PAS performance.

Table 7
Relationship between patient diagnosis and assessments not performed in clinical situations.

Patient clinical condition	Patient medical diagnosis	Main organ systems not assessed by student
Male 79 years old. Admitted to nursing home due to repeatedly risk of falling in his home.	Atrial fibliration, Chronic bronchitis, Former bilateral total hip-replacement. No feces in 3 days	Abdominal assessment related to feces output
Female 86 years old. Admitted to nursing home for rehabilitation after Knee prosthetics' operation 3 weeks ago-postoperative pain.	COPD*, Anxiety	Postoperative pain assessment, pulmonary assessment related to COPD
Female 98 years old. Receives home nursing for nutritional follow-up and administration of pharmaceuticals'.	Former breast cancer, non-specific chronic pain.	Pain assessment, abdominal-nutritional assessment related to nutritional status
Male 94 years old. Receives home nursing due to risk of falling in his home, administration of pharmaceuticals' and apply compression stockings.	Kidney failure, FCF**, Lung embolism, Cardiovascular disease, Cardiac arrest 4 years ago, Unregularly blood pressure and peripheral pulse, ventricular ulcer, urge incontinence	Neurological assessment related to risk of falling
Female 77 years old. Admitted to nursing home due to failure to thrive and nutritional follow-up.	Atrial fibliration, COPD*, malnourished, former alcohol problems.	Abdominal- nutritional assessment related to malnourishment
Male 90 years old admitted to nursing home for rehabilitation after FCF operation 2 weeks ago.	Diabetes 1, Polio in childhood- no reflexes in feet	
Male 82 years old. Admitted to nursing home for rehabilitation after FCF sinister- total prosthesis 3 weeks ago.	Prostate cancer cum met, Pacemaker, hypothyroidism. No feces for several days	
Male 85 years old. Receives home nursing due to administration of pharmaceuticals', Diabetes follow-up	Diabetes, Knee arthritis, Abdominal hernia, Pacemaker, Heart failure, Atrial fibrillation	
Female 75 years old. Receives home nursing due to administration of pharmaceuticals', apply compressions stockings, assessment of exacerbation of COPD	COPD*, Hypertension, Depression, Diabetes	
Female 99 years old. Receives home nursing due to age and assistance during morning care.	Pulmonary disease, Hypertension, reduced hearing	

*COPD- Chronic Obstructive Pulmonary Disease.
**FCF- Fractura Colli Femoris.

The initial conversation with the patient in the clinical situation was highlighted as important. This conversation mainly consisted of history-taking and pain assessment, and students indicated that a lack of self-confidence could be a barrier in certain situations and make them hyper-aware of the patients' body language. Their interpretation of the patients' body language caused several students to exclude specific B-PAS, despite what they thought was appropriate.

> 'We talked about him not being on the toilet for the last three days. He hasn't had any faeces in the last three–four days and has problems with it. The thing I should have done was to palpate, all four quadrants. But I didn't do that. It was just because he began to be like "that", it seemed to me that he began to feel that it was enough. I guess I would have felt something if I had palpated. And I should have listened to the bowel sounds'. (S1)

Students' low self-confidence in their communication skills also represented a barrier. For example, instructing the patient to change their body position to facilitate a better assessment. Students' low confidence in their use of skills then led to fragmented assessments: instead of instructing patients to change their body position repeatedly, several students chose not to perform a specific assessment.

> 'Sitting like this, upright on the sofa, when trying to assess the abdomen, you can't reach all quadrants, if I were supposed to palpate. Now I chose not to do that, because I got the impression of him not wanting to do that'. (S5)

The nursing students thus felt that confidence during the patient encounter and good communication skills in clinical situations were a prerequisite for using adequate B-PAS in clinical rotation.

3.6. How to work with B-PAS in clinical rotation

The students were conscious of contextual factors, such as when it is appropriate to perform physical assessment. They explained how this depends on where the patient is—e.g., in a home care setting or in a nursing home—and the patient's health situation, as not all home-dwelling patients need a health assessment. The students emphasized that patient transitions, e.g., between home care and nursing homes, required detailed information and thorough physical assessment.

Acceptance and expected use of B-PAS were highlighted as very important contextual factors during clinical rotation. Reassurance from preceptors and observing other health care providers perform physical assessment were highly valued. Discussions about and guidance on performance of physical assessment enabled the students to reflect on how they might integrate B-PAS into a systematic approach to clinical assessment. This contributed to increased confidence in their own performance and in their articulation of their clinical judgment.

> 'When calling the general practitioner, I could give her the assessment I did on a patient with chest pain. I could say, "He has chest pain, with radiation of the pain in his left arm, feeling nauseated, blood pressure 158/100, palpation of the left radial artery is 140 irregularly but symmetric to the right radial artery. Respiratory rate at 35, dyspnoea, he is using an extra set of muscles when breathing. We are taking an ECG. Should we also give him nitro-glycerine?' (S4)

The students highlighted the importance of role models—preceptors, general practitioners and peer-nursing students—in clinical rotation. Performing co-assessments with role models and discussing findings increased students' confidence in their own assessments and stimulated performance of physical assessment in other clinical situations.

4. Discussion

This study reports on nursing students' reflections-in-action and reflections-on-action using B-PAS during clinical rotation. Study findings offer important insight into facilitators of and barriers to students' performance of physical assessment, and how pedagogical approaches must be taken into consideration when designing learning activities in B-PAS, as illustrated in Fig. 1.

4.1. Barriers to inadequate use of B-PAS

Several findings are similar to other studies of students' self-reported use of PAS and perceived barriers in their reflections on the clinical

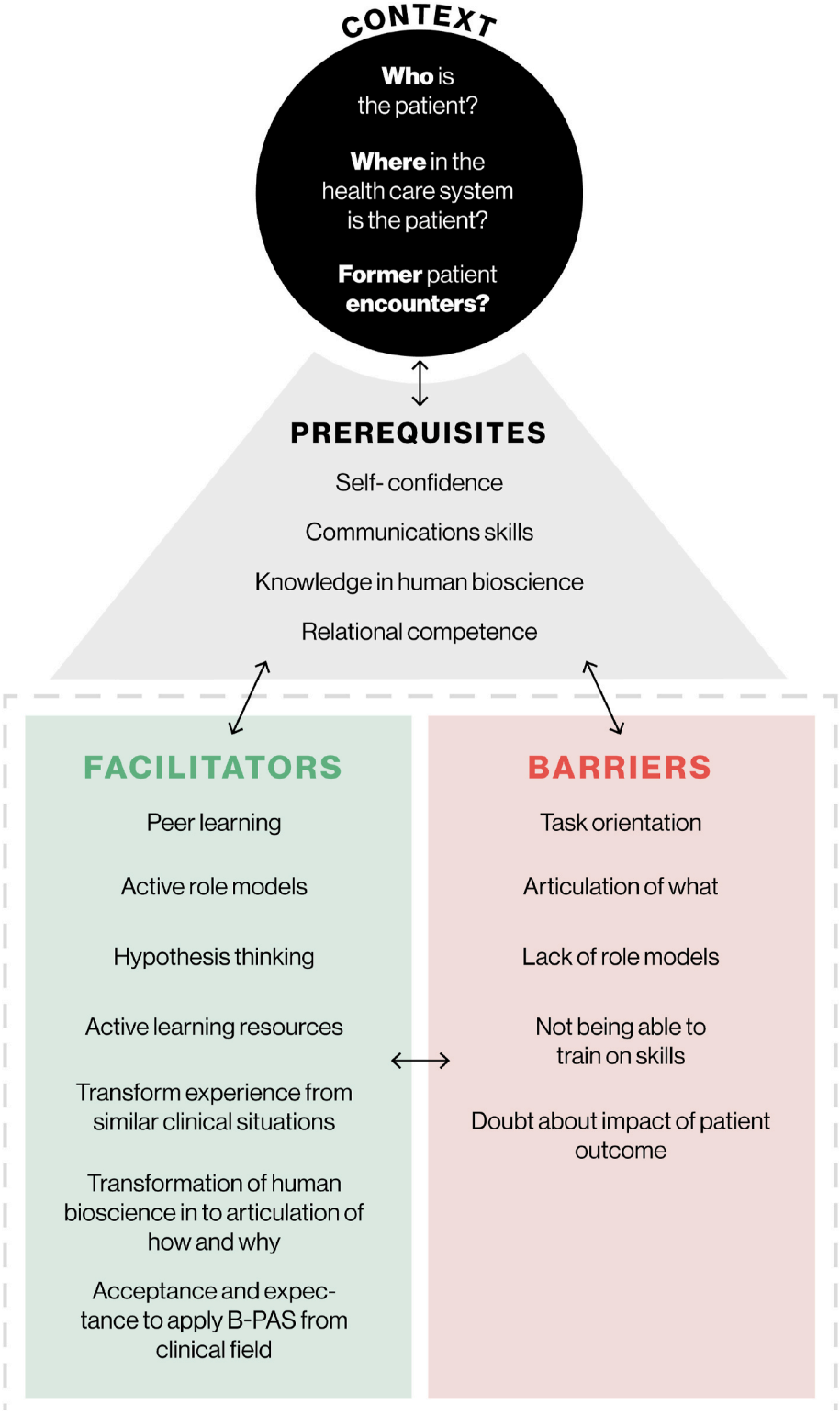

Fig. 1. Facilitators and barriers in Basic Physical Assessment Skills (B-PAS) utilization. NOTE: Utilization of B-PAS are influenced by prerequisites', and the context of the patient encounter. Facilitators and barriers can be both influence the students' prerequisites', and vice versa. When facilitating factors are dominating, the barriers are the weakened, and vice versa.

situation—these include low self-confidence, doubt about the utility of B-PAS, and lack of role models (Douglas et al., 2015). In their reflections on their actions, students were aware of their own competence and confidence as barriers. They performed less assessments based on signals from the patient or the clinical rotation placement site, even when they believed they should have done an assessment. Students' communication skills and relational competence in the patient encounter also affected the skills and assessments applied—and the integration of these competencies with knowledge in human bioscience was seen as necessary for successful use of B-PAS. As other studies have found, this can be challenging for students practising B-PAS who are novices in transforming theoretical knowledge into practical use.

Students often applied more assessment than required based on predetermined rules, rather than adapting their approach based on the patients' current status. Their clinical judgment process during the SRI was more concerned with descriptions of the skills they had used, rather than giving rationales of *why* they used them. This in turn could impact their awareness of new cues that may arise during a clinical situation—cues that would remain unassessed due to the students' task-oriented focus—and thus can be considered a barrier to adequate skills performance (Burbach and Thompson, 2014; Itano, 1989).

4.2. Facilitators of adequate use of B-PAS

The students found it difficult not only to recall facts, but also to synthesize and use their own knowledge in the clinical situation. Clinical situations are sometimes complex and critical, requiring that students master a broad spectrum of skills and translate relevant human bioscience knowledge to identify cues of clinical deterioration (Levett-Jones et al., 2010). Cue identification is influenced by what nurses bring into the situation (Tanner, 2006), and students brought with them expectations based on their knowledge about the patient, their theoretical knowledge, and the patient's patterns of responses.

The students' process of becoming patient- and context-centred was evident when they were selective in their data and cue collection, and in their ability to articulate the *why*—i.e. integrating human bioscience into their clinical judgment process (Levett-Jones et al., 2009; Jensen et al., 2018; Craft et al., 2016). This is in line with students' rationale for and articulation of their scope of practice (Jensen et al., 2018; Craft et al., 2016).

Students' familiarity with a situation, as well as knowledge developed through prior experience, are antecedents for cue recognition (Messmer et al., 2004). This underscores the need for educational programmes to facilitate students' reflection on human bioscience as it relates to specific clinical settings and cues. The combination of different teaching methods, such as practical skills appliance, clinical simulation and digital simulation, enable students to break down what is happening in a clinical situation. They also prompt further reflection-on-action and facilitate declarative knowledge—a conscious awareness and understanding of the specific subject (Tanner, 2006; Ashley and Stamp, 2014).

4.3. Educators' facilitating role in adequate use of B-PAS in clinical practice

The cognitive processes of clinical judgment in the performance of physical assessment must be addressed to fully understand how to successfully implement physical assessment in nursing education. A point that needs to be raised is how educators can facilitate students' ability to trigger reasoning patterns in their development in the clinical judgment process (Levett-Jones et al., 2009; Tanner, 2006). Noticing patterns requires the performance of adequate physical assessment in the face of complex elements that must be integrated in a patient encounter; this requires combining communication skills, relational competence, human bioscience knowledge and practical skills (Levett-Jones et al., 2009; Zambas et al., 2016).

Based on the complex nature of the knowledge students need to perform adequate assessments, and as we found the presence of limiting contextual factors and low confidence in students' own knowledge, is it important that faculty collaborate closely with students (Burbach and Thompson, 2014; Zambas et al., 2016; Gillespie and Paterson, 2009). This is especially important during their theoretical coursework, to facilitate practical learning activities that a) give a deeper understanding of human bioscience, and b) show how to articulate and transform theoretical knowledge into hypothesis thinking and practical use and interpretation. Digital simulation with virtual patients constitutes a learning activity in a non-clinical course that prepares students to 1) take an active approach to understanding what is happening with the patient; 2) act upon their interpretation; and 3) perform nursing interventions (Padilha et al., 2019; Price et al., 2017; Douglas et al., 2015). Perspectives relevant to the nursing curriculum, such as relational competence and communication, can be integrated into these learning activities. Moreover, the preceptors and faculty members whom the students meet in their clinical rotation represent important role models: they can support the students, communicate clear expectations that B-PAS are an integral part of nursing practice, and emphasize students' use of bioscience knowledge when performing assessments. This can help reduce the barriers identified in this study.

5. Strengths and limitations

Data were obtained from students who had an interest in B-PAS, which represents a possible limitation of the study. Moreover, including only pre-defined clinical rotation sites may have affected the preceptorship of students. However, including two different community health care contexts in the study should be considered a strength. The researcher was an experienced faculty member with expert knowledge in physical assessment and clinical competence—hence; she could notice important actions during observation and follow these up during the SRI.

6. Conclusion

This paper provides new knowledge about how nursing students perform B-PAS and how they describe their process of clinical judgment, and proposes strategies for systematic and confident use of B-PAS. Implementing pedagogical strategies and learning activities that facilitate reflection-in-action and reflection-on-action may enable students to collect and adequately act upon cues, such as clinical and digital simulation that emphasize reflection-on-action in the debriefing phase. Activities of this nature will teach students to remember former experiences and transform these into performance in their assessments. Research is needed to explore how and which learning activities in human bioscience might influence nursing students' development around the adequate use of PAS. Additionally, further exploration is needed on how reflection-in-action and reflection-on-action regarding physical assessment while in clinical rotation could be made a compulsory learning activity. Moreover, how to integrate relational competence, communication skills and nursing in general as perspectives when implementing physical assessment learning activities.

CRediT authorship contribution statement

Kirsten Røland Byermoen: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Resources, Writing - original draft, Writing - review & editing, Visualization, Project administration, Funding acquisition. **Espen Andreas Brembo:** Methodology, Formal analysis, Validation, Supervision, Writing - review & editing. **H. Ösp Egilsdottir:** Conceptualization, Validation, Writing - review & editing, Funding acquisition. **Lena Günterberg Heyn:** Validation, Writing - review & editing, Supervision. **Anne Moen:** Conceptualization, Validation, Supervision, Methodology, Writing - review & editing, Funding acquisition. **Hilde Eide:** Conceptualization, Methodology, Validation, Writing - review & editing, Supervision, Funding acquisition.

Declaration of competing interest

Not applicable.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2020.102913.

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Ethical approval

The Norwegian Centre for Research Data (NSD) (Project No. 196758) approved the study.

Otherwise none approval from Regional Ethical Committee in Norway was needed.

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Study 2

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RESEARCH

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Nursing students' development of using physical assessment in clinical rotation—a stimulated recall study

Kirsten Røland Byermoen[1*], Tom Eide[1], H. Ösp Egilsdottir[1], Hilde Eide[1], Lena Günterberg Heyn[1], Anne Moen[2] and Espen Andreas Brembo[1]

Abstract

Background: The overall aim of this study was to explore third-year bachelor nursing students' stimulated recall reflections on their physical assessment competence development. The choice of learning strategies in nursing education seems to have great impact on nursing students' use of physical assessment skills while in clinical rotation. There is a need to explore nursing students' learning processes related to the use of physical assessments.

Methods: Explorative qualitative design using a triangulation of data collection methods. Nine final-year nursing students' physical assessment performances during patient encounters were audio-taped and observed. Shortly after, an individual stimulated recall interview based on the audio-recorded patient encounter and observation notes was conducted. A two-fold analysis was conducted: 1) analysis of students' performed assessments, and 2) phenomenological hermeneutical analysis of the stimulated recall interviews.

Results: Nursing students assessments shifted from a checklist approach to a symptom-based, more holistic and person-centred approach, emphasizing conversation as part of their assessments. The nursing students also reported that a safe and stimulating learning environment was a prominent feature for their continuing development. Learning from skilled role models with expectations to them using physical assessment skills facilitated their continuing skills appliance, interprofessional communication and reflective practice.

Conclusions: This study contribute with a novel, comprehensive and in-depth description of what influenced nursing students' learning processes experiences of using physical assessment skills during clinical rotation. The results reveal the need for targeted course designs by implementing scaffolded learning activities in practical and theoretical courses aimed at strengthening students' learning of physical assessment skills—building upon and emphasizing their prior knowledge and competence, which may lead to more confident registered nurses and promote patient safety in different health care contexts. We propose using stimulated recall systematically as a novel reflective learning activity in nursing education to foster clinical reasoning and metacognition skills and achieve deep learning.

Keywords: Physical examination, Nursing assessment, Clinical reasoning, Clinical competence, Education nursing, Student placement, Stimulated recall interview

Background

Health reforms aim to strengthen primary health care and reduce hospitalization [1, 2]. With an ageing global population, comorbidity and complex health problems, modern health reforms address increasingly complex

*Correspondence: kirsten.roland.byermoen@usn.no

[1] Centre for Health and Technology, Faculty of Health and Social Sciences, University of South-Eastern Norway, Grønland 58, 3045 Drammen, Norway
Full list of author information is available at the end of the article

challenges in primary health care. This increased complexity makes it more demanding for nurses to perform thorough, valid assessments of patients' current health status, as well as to anticipate future clinical changes. Clinical nursing skills and competence are therefore in great demand. The implementation of early warning score (EWS) systems and advances in nurses' competence within physical assessment skills represent practical and proactive approaches that help nurses detect clinical deterioration and prevent complications [3, 4]. Newly graduated nurses are expected to have sufficient clinical competence to secure patient safety and meet quality standards of care [5]. Hence, there is a need to readdress undergraduate nursing curricula regarding clinical competence, to prepare nursing students for demanding challenges and increased nursing competence needs [6].

Physical assessment are core clinical competences in nursing practice, forming the basis of nursing students' preparedness for potentially complex patient encounters as registered nurses [4]. Obtaining subjective and objective data through physical assessment enables nurses to provide more accurate assessments of patients' medical and clinical conditions [6]. A standardized interdisciplinary assessment scheme provides a standardized terminology across health care disciplines that can increase the overall quality of care for patients in complex clinical encounters [7].

Studies has over the last decade reported that nursing students and newly graduated nurses do not perform all of their learned physical assessment skills during clinical encounters [8–11]. Several factors limit their use of physical assessment skills, such as role ambiguity, reliance on technology, collegial support and culture, practice variations across specialities, lack of confidence and knowledge, and over-teaching using the biomedical model [12]. Studies indicate that implementation of physical assessment courses in nursing education increases students' confidence, assertiveness and self-esteem [13–16].

In an earlier study, we examined the implementation of a physical assessment skills curriculum at our university, and proposed a model to scaffolding of physical assessment practice over the three-year education [8]. Using self-reports, we also identified which skills were frequently, or less frequently, used in clinical rotation. Assessments of the heart and peripheral circulatory system (emphasizing inspection, palpation, blood pressure and blood oxygen) were most used, and assessments of neurology, percussion and auscultation in abdominal, respiratory and circulatory systems were least used. Factors that hindered practice were lack of support in the learning environment and preceptors not using physical assessment skills. We also performed an observation study combined with a stimulated recall interview (SRI) to gain more in-depth knowledge about how third-year nursing students learn and practise specific physical assessment skills—and to explore facilitators and barriers in the learning process [17]. Facilitating factors included peer learning; students' ability to transform experiences from prior clinical encounters; their ability to articulate reasoning in relation to human bioscience; and engaged role models who expected students to perform physical assessment. A lack of role models and few opportunities to practise were reported as barriers to assessment skills practice, as was students' doubt about its impact.

To our knowledge, there are no longitudinal follow-up studies that explore students' development of physical assessment over time. Moreover, nursing students' learning process around physical assessment remains underresearched, specifically with regards to promoting and supporting their development of competence in this area.

Methods

Aim and research questions

This paper is part of a longitudinal study exploring students' competence development of physical assessment during several clinical rotations in undergraduate nursing education. The overall aim of this paper is to explore third-year bachelor nursing students' 1) physical assessment practice, and 2) stimulated recall reflections on their competence development. The following research questions guided the analysis and interpretation of the results:

- Which physical assessment skills do students apply during patient encounters and why?
- What do the students experience as important learning environment factors influencing their learning process?
- Which learning strategies do the students apply during clinical rotation to integrate physical assessment as a routine?

Design

This is a follow-up study, utilizing the same data collection method and student sample from a previous study [17]. The study has an explorative qualitative design and uses a triangulation of data collection methods, as illustrated in Fig. 1: 1) observation including notes and audio-recordings of nursing students during a patient encounter, and 2) SRIs based on the audio-recorded patient encounter. Exploratory design explores the full nature of a phenomena, to shed light on various factors and underlying processes [18]. The chosen study design was selected to capture perspectives of nursing students'

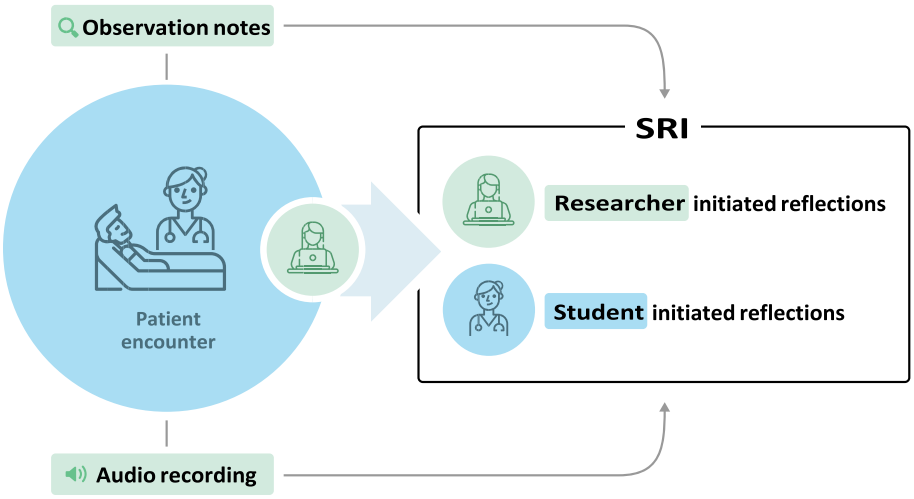

Fig. 1 Visual model of data collection

perceived experiences and enable in-depth observation of which physical assessment skills they used.

Data collection and sample

Data were collected in March 2019, during week 7 or 8 of the programme's final clinical rotation (a total of 8 weeks/240 hours). Fifteen final-semester nursing students who had their final clinical rotation in a predetermined nursing home and home care location were invited to contact the clinical rotation coordinator if they were interested in taking part in the study. The first author then provided them with detailed oral and written information. Nine students agreed to participate. A total of eight patient encounter observations and nine interviews were conducted.

Participating nursing students ranged from 23 to 50 years of age, with an average of 31. One participant was male; three did not have Norwegian as their native language; five had prior health-related work experience; and six were working as auxiliary nurses during their education (Table 1).

Eight patients also agreed to participate and signed the consent form before the researcher was introduced. One student and preceptor were unable to recruit a patient: nevertheless, this student had previously performed physical assessment of a patient prior to the researcher's arrival, and wanted to share experiences from this assessment and their own development in the use of physical assessment in an interview.

Table 1 Characteristics of the student sample

Background information	Age-range[1]	Health-related work experience prior to education start (years)	Health-related work experience during education (shifts/week)	Number of PAS performed during patient encounter ($N=44$)	Patient encounter time (minutes)	SRI time (minutes)
Student 1	1	2.5	2	8	24	42
Student 2	2	0	0	14	8	43
Student 3	1	0	2.5	12	13	27
Student 4	3	0.5	0	24	16	44
Student 5	1	6	2.5	–	–	17
Student 6	1	0	2	24	17	47
Student 7	1	6	2.5	14	27	34
Student 8	3	0	0	5	17	30
Student 9	2	5	2	13	16	31

[1] Age range: 1: 23–30 years old; 2: 31–40 years old; 3: 41–50 years old

[2] *PAS* Physical assessment skills

Participating patients ranged in age from 60 to 89, with an average age of 79. Two were male; all had Norwegian as their native language; one lived permanently in a nursing home; three received in-house rehabilitation; and four received home care.

Observation of students' physical assessment performance

Empirical data from the patient encounter comprise the following: 1) direct observation by the first author with observational notes and audio-recording of the patient encounter, and 2) audio-recordings of student–patient interaction during the encounter. Structured observational notes based on the physical assessment curriculum (Table 2) were used to systematically and objectively assess which physical assessment skills were applied.

The students were encouraged to perform assessments they considered relevant during that encounter. All patient encounters differed, as the invited patients had different diagnoses and health situations and were in either home care or in nursing homes. Direct observation by the researcher was essential to complement the audio-recordings, in order to observe 1) non-verbal communication, and 2) performance of the assessments.

Individual stimulated recall interview (SRI)

The first author conducted an individual SRI with each student shortly after the patient encounter to ensure immediate recall of the clinical situation and contextual elements. SRIs provide an in-depth exploration of the patient encounter through the students' reflections [19]. The SRI took place in a private room at the clinical rotation site. At the nursing homes, the SRIs were conducted within 5 minutes after the patient encounter; SRIs in the home care setting were conducted once the students had returned to their rotation base (within approximately 20 minutes).

The SRI has been found to be a reliable methodology [20] that is well-suited to explorations of nursing students' behaviours and reflections on their own actions while performing physical assessment. In the present study, the SRI entailed interviewing students while listening to audio-recordings of the patient encounter. Students were encouraged to pause the audio-recording whenever they felt like sharing their reflections. When events occurred that called for further exploration and reflection, the researcher would suggest that they pause the recording if the student had not already done so.

A thematic interview guide included questions that explored 1) perceptions about performing physical assessment during the patient encounter, 2) factors influencing the use of physical assessment, 3) students' reasons for performing the specific assessment skills in that particular situation, and 4) students' own experience of their development during their final clinical rotation. The observational notes from each patient encounter enabled the researcher to point out areas to discuss with the student, of their performance (or not performance) of specific assessment skills.

Table 2 Overview of physical assessment skills curriculum

Organ system	Physical assessment skills curricula
Heart and peripheral circulatory system	Inspect extremities for skin colour/hair growth
	Palpate distal pulses
	Count pulses
	Palpate for oedema
	Palpate and inspect capillary refill
	Estimate turgor
	Evaluate extremities for skin sensation
	Assess fine motor skills
	Take blood pressure
	Auscultate heart sounds
	Auscultate carotid artery
Respiratory system	Inspect thorax for shape, breathing effort
	Inspect thorax for skin colour/scar
	Palpate thorax wall for thoracic expansion and vocal fremitus
	Percuss lungs
	Auscultate lungs
	Assess SpO_2[1]
Abdominal system	Inspect abdomen
	Auscultate abdomen for bowel sounds
	Abdominal palpation
	Percuss the abdomen
	Percuss for kidney tenderness
Neurological system	Evaluate mental status
	Evaluate CN I–XII[2]
	Evaluate muscle strength, atrophy, tone
	Evaluate sensation of touch
	Assess coordination and balance
	Evaluate patella and plantar reflexes

[1] *SpO_2:* blood oxygen level,[2]*CNI-XII Cranial nerves numbers 1–12*

Data analysis

The data analysis involved 1) analysis of the students' performance of physical assessment during the patient encounter, and 2) analysis of the SRIs.

Analysis of nursing students' performed physical assessment

The analysis of students' performed assessment was based on the researcher's observations and the student's reasoning during the SRI regarding their performed assessment. The data from the patient encounter consist of a report of the patient's clinical condition and medical diagnosis and the structured observation notes about the

student's performed physical assessment. The evaluation consists of the nursing student's use of physical assessment skills during the encounter: i.e., which assessment skills were performed, how skills were applied and the student's reasoning during the SRI.

Analysis of the stimulated recall interviews

Audio-recordings from each SRI were transcribed verbatim. Although both patients' and students' voices from the encounter were present in the audio-recordings played during the SRI, it was only the interaction between the student and the researcher that was transcribed. The qualitative analysis of the text followed Lindseth and Norberg's phenomenological hermeneutical approach, moving repeatedly through the three stages of naïve reading, structural analysis and comprehensive understanding, as described below [21]. We were also inspired by Brinkman and Kvale's description of the systematic process of moving from meaning units and condensed meaning units, to codes and categories [22] as shown with an example in Fig. 2.

KRB, TE and EAB were responsible for the analysis. We first read all interviews in a reflexive, naïve and inductive manner, to gain impressions of the meaning of the text as a whole. At this stage, we sought an overall understanding of the students' learning process and how they experienced their own performance of physical assessment. KRB then structured the text into meaning units by posing analytical or productive questions to the text. The next steps of analysis were highly iterative and hermeneutic in nature and involved a cycle of repeated reading, processes of decontextualization and recontextualizations of empirical excerpts, and frequent discussions between the three researchers [21]. Meaning units, codes and categories were assessed several times and validated or refuted based on a joint understanding of the empirical excerpts. Codes were derived from the meaning units once they were considered to reflect and represent meaning across the data. In the final step, the main categories were developed [22].

Research ethics

The Norwegian Centre for Research Data (NSD) approved the study (Project No. 196758). The involved municipalities and institutional leaders granted their approval before patient recruitment began. The students

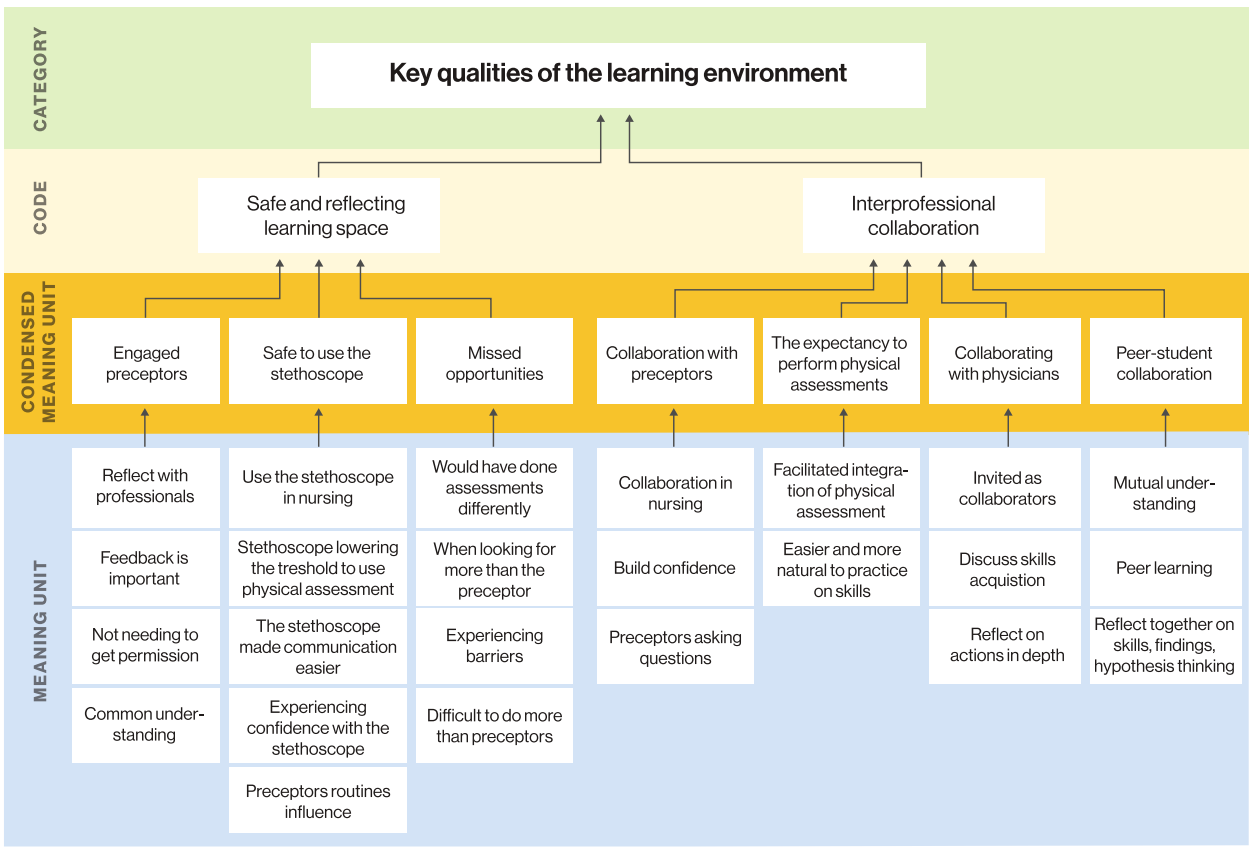

Fig. 2 Analysis from meaning units to categories

and preceptors approached eligible patients with written and oral information about the aim of the study (i.e., direct observation and audio-recording). Only patients who were able to consent to participation were invited. The researcher was first introduced to the patient after a signed consent form was obtained. No data were collected from the patients, other than the diagnosis and medical condition presented by the student.

The students knew the researcher primarily as a member of the faculty in the Bachelor of Nursing programme at the university. Throughout the study, the students were given oral and written information reminding them that their participation and performance in the study would not be evaluated as a part of the clinical rotation. The faculty member responsible for the formal evaluation of the student did not discuss the students' performance or reflections with the researchers.

As the imbalanced power relationship between researcher and student requires attention [23, 24], the researcher was conscious of the students' experiences when they were asked to articulate and reflect upon their own skills application, competence and knowledge. The researcher worked to build rapport, use careful wording, and attend to their own and the students' body language to reduce discomfort [25, 26]. To decrease the risk of observer bias, all students were explicitly encouraged to correct the researcher during the SRI, while listening to the audio-recordings and reflecting on their performance.

Results

In this section, we first present descriptions of students' performed assessment skills and reasoning during the patient encounters that were based on the observations. We then describe findings from the SRIs.

Nursing students' performed assessments and reasonings

A common strategy for all students was to converse with the patients to perform a quick assessment of their current clinical condition. The conversations revealed possible clinical changes in the patients' health condition, which helped most students determine which physical assessment skills to perform. Consequently, most students did not perform all of the skills they had learned, instead focusing on the patients' concerns and symptoms through a symptom-based approach. Half of the students used a head-to-toe approach that supported a systematic flow of the performed assessment skills.

Our analysis of the observations showed different competency levels for students' clinical reasoning regarding their performed physical assessment. Students who referenced prior clinical experiences during the current patient encounter to determine which skills to use also performed more targeted physical assessment (Table 3). Students who did not do so were less able to articulate why they performed specific assessments, nor discover relevant skills to perform during the encounter.

Nursing students' reflections during SRIs

Viewing the patient encounter and their own performance was the starting point for the students' reflections during the SRI. The analysis resulted in several codes and two main categories: *perspectives on competent use of physical assessment in clinical rotation* and *key qualities of the learning environment* (Table 4).

Category 1: perspectives on competent use of physical assessment in clinical rotation

The nursing students described their experiences using physical assessment during their final educational clinical rotation. Five codes were identified highlighting how they perceived their own use of physical assessment in clinical rotation: 1) perceived usefulness of performing physical assessment, 2) change of assessment approach, 3) need for continuous practice of skills, 4) increased attention on communication as part of physical assessment and 5) ways of learning physical assessment skills in clinical rotation.

Perceived usefulness of performing physical assessment

The students described various aspects related to using physical assessment in practice: these emphasized that a systematic approach was experienced as meaningful and valuable. They reported several, partly overlapping reasons. Practising physical assessment made it easier to cope with critical situations, as they could use a quick assessment approach ('You can do some more assessments because the patient is feeling bad', S9) and then move to a more thorough assessment, if necessary ('We discovered something in our initial assessment, so we chose to perform a more thorough assessment', S5). Using physical assessment also made it easier for students to communicate with other health care personnel, especially when communicating urgent messages. Here, one of the students referred to a situation where a physician, rather than waiting to see the patient the following day, changed his approach because of the student's prompt and appropriate assessment ('The physician came to see the patient quickly, and the patient was transported to the hospital right away', S12). The students highlighted the value of being able to formulate, communicate and document findings from their physical assessment. Moreover, the systematic documentation gave the students a vocabulary with which to report data and subsequent actions in collaborative care ('If you document, then it becomes more specific', S2).

Table 3 Evaluation of nursing students' performed assessment skills

Patient clinical condition	*Patient medical diagnosis*	*Nursing students' performed physical assessment skills*	*Evaluation of student performance*
Female 74 years old. Receives home nursing follow-up after hip surgery dexter, 2 months ago	Recurrent hip luxations—surgical treatment several times, COPD[1], hypertension	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, take blood pressure, auscultate heart sounds **Thorax:** Inspect thoracic wall for shape and breathing effort, inspect thorax for skin colour/scar, auscultate lungs, assess SpO2[2] **Abdomen:** Take history on bowel function and perform inspection inside mouth on mucosa and teeth **Neurology:** Take history on neurological status/movement in legs and feet, assess mental status, cranial nerves II	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a head-to-toe approach, where patient's symptoms are in focus for skills application. Student references prior clinical encounters to support clinical reasoning for performed assessment skills. The current patient encounter is a starting point for reflections, and reflections go beyond the actual assessment on the audio-recording.
Female 60 years old. Receives home nursing for maintenance and care of suprapubic catheter. Severe spinal pain—pain management. Elbow wound treatment	Several spinal surgeries—with complications, unable to hold torso upright	**Heart and peripheral circulation:** Inspect thorax for shape, breathing effort, assess pain sensation **Abdomen:** Inspect abdomen/skin around the suprapubic catheter, light abdominal palpation **Neurology:** Assess mental status	Student initiates encounter through conversation. No assessment skills were explicitly performed. Left out relevant assessments related to heart and peripheral circulation, pain management and abdominal assessment due to complications in torso. Student articulates which assessments and the reasoning for why they were performed.
Female 89 years old. Receives home nursing due to age and assistance during morning care	Rheumatoid arthritis, Sjögren syndrome, heart failure, hypertension, pneumonia 12 weeks ago, ear infection 5 weeks ago	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, estimate skin fold, assess pain sensation **Thorax:** Inspect thorax for shape and breathing effort, inspect thorax for skin colour/scar, palpate thorax wall for thoracic expansion and vocal fremitus, percuss lungs, auscultate lungs, assess SpO_2.[2] **Abdomen:** Perform inspection inside mouth on mucosa and teeth **Neurology:** Assess mental status	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a symptom-based approach through history-taking and conversation. Student references prior clinical encounters to support clinical reasoning for performed assessment skills. The current patient encounter is a starting point for reflections, and reflections go beyond the actual assessment on the audio-recording.

Table 3 (continued)

Patient clinical condition	*Patient medical diagnosis*	*Nursing students' performed physical assessment skills*	*Evaluation of student performance*
Female 94 years old. Admitted to nursing home due to failure to thrive	Asthma, former PCI[3] intervention, former breast cancer and uterus cancer—no complications after surgery	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, palpate and inspect capillary refill, evaluate extremities for skin sensation, assess fine motor skills, take blood pressure, auscultate heart sounds **Thorax:** Inspect thorax for shape and breathing effort, converse with patient about their breathing effort **Abdomen:** Take history on bowel function, inspect abdomen, auscultate abdomen for bowel sounds, abdominal palpation **Neurology:** Assess mental status, cranial nerves II, V and VII, tone and muscle strength in arms, sensation of touch under feet	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes head-to-toe approach, where patient's symptoms are in focus for skills application. Student references prior clinical encounters to support clinical reasoning for performed assessment skills. The current patient encounter is a starting point for reflections, and reflections go beyond the actual assessment on the audio-recording.
Male 82 years old. Admitted to nursing home due to rehabilitation and mobilization and rehabilitation after cardiac arrest 14 days ago	Diabetes 2, hypertension, atrial fibrillation, atrial flutter, heart failure, anxiety, sleeping disorders, urinary retention, sacral pressure ulcer—fourth degree, heel ulcers on both feet, cardiac arrest—14 days ago, vertigo	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, palpate and inspect capillary refill, assess fine motor skills, take blood pressure, auscultate heart sounds **Thorax:** Inspect thorax for shape, breathing effort, palpate thorax wall for thoracic expansion and vocal fremitus, percuss lungs, auscultate lungs, assess SpO_2[2] **Abdomen:** Inspect abdomen, auscultate abdomen for bowel sounds, abdominal palpation, percuss for kidney tenderness **Neurology:** Assess mental status, cranial nerves II, III, IV, VI, VII, VIII, IX, XI and XII	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a head-to-toe approach where patient's symptoms are in focus for skills application. Left out relevant assessments related to blood glucose The current patient encounter is a starting point for reflections, where the student mainly focuses on which B-PAS requires more practice. Gives rationale for performed assessments without further elaboration on why.
Female 87 years old. Admitted to nursing home for post-operative rehabilitation, mobilization and pain management after acute compression fracture in L4[4] surgery	Hypertension, macular degeneration—10% eyesight, glaucoma, ischemic heart disease, osteoporosis, hiatus hernia, former ischemic cerebral insult and heart attack	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, palpate and inspect capillary refill, assess fine motor skills, take blood pressure, auscultate heart sounds **Thorax:** Inspect thorax for shape and breathing effort, percuss the lungs, auscultate lungs, assess SpO2[2] **Abdomen:** Take history on bowel function, inspect abdomen, auscultate abdomen for bowel sounds, abdominal palpation. **Neurology:** Assess mental status	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a symptom-based approach through history-taking and conversation. The current patient encounter is a starting point for reflections, where the student mainly focuses on clinical reasoning for performed assessments.

Table 3 (continued)

Patient clinical condition	*Patient medical diagnosis*	*Nursing students' performed physical assessment skills*	*Evaluation of student performance*
Male 65 years old. Receives home nursing due to diabetic ulcer wound care on right foot	Diabetes 1, neuropathy	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate and assess distal pulses, palpate for oedema, evaluate extremities for skin sensation, assess fine motor skills on feet **Neurology:** Assess mental status	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a symptom-based approach through history-taking and conversation. Student references prior clinical encounters to support clinical reasoning for performed assessment skills. The current patient encounter is a starting point for reflections, and reflections go beyond the actual assessment on the audio-recording.
Female 83 years old. Admitted to nursing home due to assessment of COPD[1] exacerbation	COPD[1]	**Heart and peripheral circulation:** Inspect extremities for skin colour/hair growth, palpate distal pulses, palpate for oedema, palpate and inspect capillary refill, evaluate extremities for pain, take blood pressure, auscultate heart sounds **Thorax:** Take history on breathing effort, inspect thorax for shape and breathing effort, inspect thorax for skin colour/scar, auscultate lungs, assess SpO_2[2] **Abdomen:** Take history on bowel function **Neurology:** Assess mental status	Student initiates assessment through conversation. Performs suitable skills related to patient's clinical and medical diagnosis. Takes a head-to-toe approach where patient's symptoms are in focus for skills appliance. Student references prior clinical encounters to support clinical reasoning for performed assessment skills. The current patient encounter is a starting point for reflections, and reflections go beyond the actual assessment on the audio-recording.

[1] *COPD* Chronic obstructive pulmonary disease, [2]*SpO_2* Blood oxygen level, [3]*PCI* Percutaneous coronary intervention, [4]*L4* Vertebrae number 4 of the lumbar spine

Table 4 Factors influencing students' use of physical assessment

Category	Code	Condensed meaning unit
Perspectives on competent use of physical assessments in clinical rotation	Perceived usefulness of performing physical assessment	Easier to cope with critical conditions
		Increased experiences that their assessments had impact
		Documentation made it easier to communicate findings
	Change of assessment approach	Transformation to a head-to-toe approach
		Transformation to a symptom-based approach
		Enhanced awareness of clinical reasoning processes
	Need for continuous practice of skills	Developing understanding of appropriate situations to use physical assessments
		Need to develop ability to recognize sounds
		Need to develop reasoning skills
		Expectation of own role
	Increased attention on communication as a part of physical assessment	Enhanced application of conversation as part of the assessment
		Enhanced effort to practice on own communication skills
	Ways of learning physical assessment skills in clinical rotation	Repetition of physical assessment skills appliance
		Active choice
		Stamina
		Defers physical assessment appliance
Key qualities of the learning environment	A safe and reflecting learning space	Engaged preceptors
		Safe to wear and use the stethoscope
		Missed opportunities
	Interprofessional collaboration	Collaboration with preceptors
		Expectation to perform physical assessments
		Collaboration with physicians
		Peer collaboration

Change of assessment approach

The students were introduced to a physical assessment curriculum with skills systematized across organ systems in checklists. In the interviews, the students described using a combination of head-to-toe and a symptom-based approaches as a change of strategy from their prior clinical rotation. Several students emphasized that the head-to-toe approach ensured a complete in-depth assessment ('Then there is less risk of missing something, S4). Consequently, the students were able to learn how to approach patients' symptoms systematically ('Because then I got to cram on how I can look at a patient', S9), where they were also aided in articulating their observations ('And what to call, to put names to things [assessments]', S2). The students also described that the patient's symptoms determined which assessment skills they performed ('I'm going to use it more on a symptom-based approach and in relation to what the patient is admitted for', S9). The symptom-based approach seemed to reflect students' reasoning skills, when they reflected on why assessments were performed ('I am much better now, at thinking over why I do things', S1).

Need for continuous practice of skills

Over time, the students recognized that developing an understanding of how and when to perform physical assessment required continuous practice of skills ('I am much better than before, but I'm still … Well yes, I need to practice more', S4). Continuous practice was considered important, not only to develop the ability to listen to and recognize sounds, but also to perform the analytic activity of making distinctions and assumptions concerning the patient's condition ('I can maybe recognize crackles, stridor or wheezing, and where it is on the lungs', S1). Another student described needing continuous practice in order to combine listening skills while trying to recognize possible pathological patterns and mechanisms behind symptoms—and to make tentative diagnostic hypotheses ('Like with orthopnoea, I am beginning to know which assessments to perform and link it up to potential diagnoses, to know what the underlying

conditions is', S7). A more comprehensive understanding of the patient's current health situation through physical assessment initiated a more targeted reasoning process ('You are able to identify other types of data than reflected by the EWS', S1). The students' own ideas about what they would be expected to do following graduation became apparent ('Everyone expects you to use it [the physical assessment skills]', S9): one student, for example, described seeking different learning situations independently, trying to do as many of the tasks as possible that nurses are expected to do ('Just to build confidence', S9).

Increased attention on communication as a part of physical assessment

The students emphasized the importance of including conversation with the patient as a part of their assessments. When students took patients' thoughts into consideration in their use of physical assessment, this demonstrated cue recognition for further in-depth assessment ('Not only performing the assessments and then leaving but rather talking with the patient a bit more, assessing some more', S7). Through eliciting patients' expressed cues and concerns, the students learned to better ascertain whether the patient's clinical conditions had deteriorated ('Like the symptoms that a patient states, I am much better at recognizing that now', S6). One student expressed increased awareness around how their own communication helped the patients express themselves more ('Something more might come if I wait a bit longer and say "yes" or "mm"', S2)—and how their sensitivity during the conversation could affect the patient response ('Because once I start asking how she is feeling, it's okay to give her time and space', S2). This student further described a situation when it was easy to give patients input and then make their own conclusions on behalf of the patient. However, by practising leaving space between questions, the student gives patients more time to disclose their own matters of concerns or preference ('Because it has to come from her. [...] I try not to put the words in her mouth', S2).

Ways of learning physical assessment skills in clinical rotation

Regardless of how the students experienced the learning environment at different rotation cites, they all described strategies for using physical assessment skills on their own. By cultivating repetition and iterative skills application, the students developed a sense of habituation towards using physical assessment as an integrated part of their daily nursing ('But if I do it and do it and do it, then it will gradually make more sense', S2). One student described the inclusion of physical assessment as a natural part of nursing—a way of thinking ('I believe it will be easier if you have this mindset of implementing physical assessment in all of your thinking', S8). Stamina was highlighted in relation to skills practice ('To push oneself, until you have applied it so many times that it becomes a habit', S5). It was also described in relation to maintaining the motivation to practise specific skills—as stimulating continuous practice towards developing a repertoire of physical assessment skills ('I have been conscious throughout this rotation, to auscultate and assess as many as possible', S8). Persistent self-reflection around potential opportunities to perform physical assessment skills was also highlighted ('Could I have done something here?', S7).

In contrast to the above, some students expressed strategies to defer applying physical assessment skills during clinical rotation ('It is a bit like, when I graduate, then I will start to take more responsibility', S8), with an intention to perform physical assessment after graduation ('Because then it will be easier', S8). However, some of the students also noted that valuable practice opportunities were missed because they lacked understanding about the significance of physical assessment ('If I had been able to do it from the start, I would have performed it [physical assessment] much earlier than I did', S2).

Category 2: key qualities of the learning environment

The students described the qualities of the learning environment as essential to their learning process. Two key qualities were 1: *a safe and reflective learning space*, and 2: *interprofessional collaboration*. All students highlighted these qualities as crucial for their skills acquisition and integration of physical assessment skills into their nursing routines.

A safe and reflective learning space

For the students, it was most important to feel part of a safe and reflective learning environment ('To get support, reflect and talk about it [physical assessment skills]', S8). In a safe learning environment, the stethoscope became a more natural and acceptable device to use ('At least it hasn't been strange to use the stethoscope here', S2). The students reflected on how the stethoscope lowered the threshold for using physical assessment, enabling them to explore patient situations in-depth ('I can start by examining, assessing the patient', S5). For some students, it also seemed as if in-depth communication and the procedures that followed became easier or more natural when wearing and having the opportunity to use a stethoscope ('And I notice that it is really positive that I can wear the stethoscope. I can ask additional questions as a natural part of my nursing routine', S8). However, the students emphasized that the preceptors' routines and ways of doing things influenced their own thinking and behaviour ('We do get quite influenced by our preceptors', S1);

auscultation routines in particular seemed to be perceived as an indication of the students' own use ('I might have used it even more if there had been more nurses that uses it [the stethoscope]', S6).

Some students did not have preceptors who integrated physical assessment skills in their daily nursing practice; these students found it difficult to perform more assessments than their preceptors typically did during patient encounters. One student referenced a patient encounter in which the preceptor was finishing up the visit ('So it is a bit difficult in the sense of saying "I am just going to do this first"', S7). In these instances, some students felt they needed to justify their suggestions or actions to preceptors who considered auscultation, palpation and percussion as being in the physicians' domain rather than the nurses' ('I felt that they [the preceptors] looked at me in a peculiar way […] and they asked me when coming out to the car afterwards, "Why did you do that?"', S5). These kinds of experiences seemed to be perceived as a prominent barrier to using and practising skills, and represent the opposite of a safe learning environment ('I thought no, I won't auscultate, because I feel uncomfortable', S9).

Interprofessional collaboration

Collaboration with both nurses and physicians facilitated reflection around performed assessments in relation to patients' treatment and care ('There is more openness to have reflections on and discussions of assessments—what and why', S5). These reflections and discussions seemed to build students' confidence in their mastery of physical assessment skills ('So, I have some knowledge, and I trust it', S7). Students' collaboration with preceptors also helped them understand how to integrate physical assessment in daily nursing ('Because there is something about knowing in which clinical settings physical assessment are appropriate to perform', S7). In particular, the students found it easier to apply physical assessment when they were met with an explicit expectation from preceptors or their educational institution ('At this rotation site, you are asked specific questions such as, "Have you done this or that assessment?"', S5).

In the nursing homes, some students experienced the physicians as gate-openers for using physical assessment ('If it hadn't been for them, I don't think I would have been interested in becoming better at it', S6). Here, the physicians invited them to be collaborators in the patients' treatment and care ('The physician asks if I can do assessments', S6). Moreover, the physicians facilitated students' reflection ('What did we see, what did we feel, what did we hear, and what can that tell us?', S9).

Learning with peers was also highly valued by the students. With their shared understanding of physical assessment from the educational programme, the students saw the value of practising assessment skills together ('Then it was just the two of us', S1). One student described how peers could assess the same patient, and then compare findings ('Discuss what we heard [through auscultation]', S8). This learning activity facilitated discussions about different techniques ('Nina taught me a technique on how to palpate different pulses', S8), and lastly helped them explore physical assessment skills application together ('We motivated each other to use different assessment techniques', S5).

Discussion

This study reports on nursing student's development and use of physical assessment during clinical rotation in their final educational year. Our main finding is that students' rationales for performing specific physical assessment are based on the situation's requirements. Additionally, we report on how students' experiences of the learning environment influence their development and use of physical assessment skills. In the following, we emphasize how these findings relate to our previous study from a longitudinal perspective.

Internalization of physical assessment in clinical nursing practice

A prominent finding in this study is that most of the students were able to determine which physical assessment skills were relevant in a given clinical encounter. Rather than using all the assessment skills they had learned, they took a flexible, integrated approach to the patients' symptoms and concerns as a basis for performing assessments. The students' reasons for why they used certain skills and not others largely reveal an internalization of physical assessment: here, their attention to the patients' concerns or symptoms through cue recognition led to more targeted physical assessment appliance. This is in line with studies in both nursing and medical education, which have found that beginning learners tend to use more physical assessment skills than the situation requires [27, 28]; later in their education, students are able to cluster complex information and perform more targeted cue recognition [28].

The above finding contributes to a broader understanding of the literature, in which students' decreased use of physical assessment skills is often related to an oversaturated physical assessment curriculum [12]. In our curriculum, we have given priority to assessment skills: circulatory, respiratory, abdominal and neurological systems, which may contribute to more effective use in nursing practice. One reason for why the students now demonstrated a more targeted use of assessment skills may be that they were in a process of learning higher-order thinking, with an increased ability to perform

flexible and person-centred assessments. Furthermore, most students' determination of which assessment skills to use was also more adequately adapted to the individual patient encounter and clinical context. This concurs with research showing that variations across specialities is found in both nurses' and students' practices [8, 9, 29].

Our finding that students experienced the conversation with patients to be a crucial part of their assessments reflects a person-centred approach. This aligns with Hafskjold et al. [30], who argue that dialogue is a feasible tool for eliciting and understanding patients' cues and concerns. In this way, they can determine what currently is perceived as important by the patient and respond and act accordingly to the patient's expressed needs—while also performing a holistic and systematic assessment.

Nursing students' learning process towards the internalization of physical assessment

Notably, the students highlighted a need for continuous skills practice. The insecurity we reported in Byermoen et al. [17] around performing specific physical assessment techniques was thus replaced with a desire to continuously refine their skills application. Further, the students highlighted the need to learn in which clinical settings they could integrate physical assessment in daily nursing practice. This exemplifies how the students' experiential learning process evolved during their two final clinical rotations. This also concurs with research on how experiential learning supports higher levels of knowing when and how to integrate specific skills in practice [28].

Compared to our findings reported in Byermoen et al. [17] the students in this study used fewer physical assessment skills; however, their assessments were more targeted to the patients' condition and the students acted on cue recognition. Three factors helped the students determine which assessments to use during the patient encounter: 1) increased integration of knowledge within human bioscience; 2) increased clinical reasoning skills; and 3) increased ability to transfer knowledge from prior experiences. This is seen in another study, as well, which report that students can develop a more attentive approach to cue recognition [31]. To know what is seen, heard and felt within the full context of the individual patient encounter, as well as knowledge developed through prior experience, are prerequisites for attentive cue recognition [28]. This emphasizes that, through experiential learning, students develop stronger reasoning skills when practising their acquired knowledge of cue recognition in clinical settings [32].

The students described an increased awareness of communication with patients as an integral part of their physical assessment strategy. This can be related to the students' development of holistic attention towards the patient, where they are able to cluster information sources simultaneously, as described by Pearson [33]. Argyris and Schön [34] argue that this clustering of information works through mental mapping. Here, nursing students are guided in their cognitive reasoning processes through planning, executing and reflecting on their actions. These abilities represent a more advanced level of clinical competence. Furthermore, appropriately constituted mental maps can help students navigate the problem scenario, based upon prior knowledge and experience with similar challenges in the past; this can be seen as a part of nurses' evidence-based practice [33]. Thus, combined with prior experiences from clinical encounters, the mental maps seemed to help students determine relevant assessments through a hypothetico-deductive strategy, such as hypothesis-thinking.

Malterud et al. [35] argue that the process of interpretative understanding has the potential to change clinical practice, when complementing hypothetico-deductive strategies by recognizing additional substantial modes of reflection. Studies report that educational programmes offering hypothetico-deductive strategies can contribute to an accelerated learning process [35–37]. Specifically, hypothetico-deductive learning activities may be structured into physical assessment explorations during simulation training. With hypothesis thinking, students' previous experiences of assessment skills, knowledge in human-bioscience and nursing can be incorporated when complexity increases in their assessment findings. Simulation training with virtual patients can be a suitable learning activity where students integrate practical and theoretical knowledge through articulation and reflection [38].

The value of a safe, stimulating and collaborative learning environment

The students described a safe and stimulating learning environment as a place where the health professionals working there expected them to perform physical assessment. Interestingly, students' use of a stethoscope at the rotation site signalled that they perceived it as a safe environment in which to practise and use physical assessment skills. For example, a preceptor's lack of auscultation routines, and on the other hand, a physician's explicit request to perform an auscultation influenced whether the student's felt comfortable performing the assessment. The stethoscope has traditionally been a tool used by physicians, rather than nurses [39], and this may explain the reason for students need to perceive expectations and thus acceptance from health professionals to use it in their practice [7].

The students also described that a safe learning environment involves interprofessional collaboration, in

which they could use physical assessment skills whenever relevant. Moreover, a collaborative climate stimulated the students' own motivation and persistence to continue practising physical assessment skills. In contrast, when the students did not perceive a safe learning environment, they would avoid performing specific physical assessment skills. This aligns with findings from other studies reporting that the lack of nursing students' skills performance is related to the absence of role models and real opportunities to develop and practise skills [12, 40]. Indeed, support from the learning environment strongly influences how students develop the confidence to practise skills application and play a collaborative role in patient care, rather than a passive one [12].

Interprofessional as well as peer collaboration was emphasized by the students to facilitate reflective practices. Here, collaboration was experienced as having great value for their ongoing clinical reasoning skills and physical assessment skills development, when these were scaffolded through reflections. Reiser and Tabak [41] describe scaffolding as collaboration with a 'more knowledgeable other', which can help learners bridge their current knowledge with more sophisticated practice. In clinical encounters, collaboration with health professionals and peers provided opportunities for students to discuss skills, findings and possible interpretations; this, again, helped them develop higher-level abilities around clustering information and cue recognition. This finding concurs with prior research showing that collaboration initiates reflection through discussion with interprofessional teams or preceptors about students' skills performance in clinical encounters [11, 32]. Interprofessional collaboration is also proposed as a significant component that provides students with opportunities to integrate theoretical and practice-based assessments [42].

Collaboration enables students to engage in different modes of reflection exercises that can help them achieve different goals through surface and deep learning, as Hattie and Donoghue [43] argue. In terms of developing physical assessment competence, surface learning is adaptive: for example, students learn both to perform physical assessment skills and interpret their findings. Achieving deep learning is more complex, and includes more conditional knowledge, such as the refinement of skills application, clinical reasoning and cue recognition in new contexts. Deep learning can be stimulated through students' reflective practice around their own physical assessment performance via stimulated recall; this may represent a significant learning activity supporting students' deep reflection on their own assumptions and/or performance. A reflective practice can further enable students to discover new ways of thinking and analysing clinical situations [44, 45].

The students in this study shared their ideas and experiences related to their own achievements, and how they could best learn while in clinical rotation. Most of them reported having engaged in a mode of reflection that Winne and Azevedo [46] describe as metacognition, which entails learning about learning. Thus, to increase nursing students' reflexivity around their own learning, metacognition should be emphasized in their learning activities. This can help them become aware of and take responsibility for how they approach their own way of learning, while practising and developing their physical assessment skills. We also suggest implementing stimulated recall as a mandatory learning activity for students in physical assessment courses, scaffolded by faculty or preceptors, to provide deeper learning. Giving students the opportunity to discuss and reflect on their physical assessment performances while viewing their performance may prompt both surface and deep learning, as well as metacognition. By achieving deeper learning around their own physical assessment performance, nursing students can learn to extend these experiences to other contexts after graduation.

Strengths and limitations

The nursing students participating in this study were motivated to refine and develop their physical assessment competence from the outset; as such, one may question whether they are representative of their nursing student cohort at the university. Moreover, the participants' average age was slightly higher than the average at the university, which is 25 years. However, findings suggest that the students had similar experiences related to the use of physical assessments and learning environment during their clinical rotation, regardless of their overall competence or age.

The dual reflections occurring as part of the SRI may be biased in instances where the researcher addressed other topics than those the students intended to address. However, we can assume this approach helped the students identify aspects that deserved further elaboration through reflective practice.

Rigor, an important consideration in a qualitative study [47], was ensured by the thorough iterative phenomenological hermeneutical approach, and by a complementary research team. The researchers who participated in the data analysis and interpretation have different backgrounds within nursing science, communication, health services research, ethics and educational studies, and included both women and men. This strengthened the reflexibility of the study, reduced researcher bias and ensured that the students' perspectives and experiences were understood in-depth.

Another strength of the study is that its findings on students' use of physical assessment skills are transferrable to international settings within physical assessment courses in nursing education. Moreover, this paper describes different processes influencing nursing students' experiences around their development of physical assessment competence: this, too, is relevant across skills education and levels.

Conclusion and implication for practice

This study offers a novel, comprehensive and in-depth description of what influenced nursing students' learning processes of using physical assessment skills during clinical rotation. Our study demonstrates the importance of designing and implementing appropriate learning activities that facilitate nursing students' development of physical assessment skills. The results reveal that integrating physical assessment skills training in daily nursing practice involves a complex personal learning transition—starting from a checklist-oriented approach considering all learned skills, to using communication and a symptom-based approach to perform targeted assessments. Therefore, there is need for introducing and scaffolding physical assessment skills as an integral part of theoretical and clinical rotation curriculum development. We suggest that nursing education implement compulsory learning activities that explicitly aims at supporting nursing students' ability to articulate their theoretical understanding – through reflective practices and clinical reasoning processes with peers, preceptors and faculty.

A safe learning environment at the clinical rotation site enabling collaborative learning, interprofessional communication and reflective practices is key in fostering development of nursing students' physical assessment skills. Educational research can further explore nursing students' learning processes of using physical assessments in different clinical contexts, such as in the setting of specialist health services, where students collaborate more closely with several professions in their learning processes, offering locally available and qualified support in the use of physical assessment skills.

Systematically nurturing nursing students' physical assessment competence and clinical reasoning early in their education may lead to more confident newly graduated nurses—who, in turn, will contribute much-needed competence that enhance patient safety at all levels of health care.

In this study, we have employed stimulated recall as a research method to directly observe and record how students actually perform physical assessment skills. The findings elicit how stimulated recall makes nursing students reflect in ways that incorporate the complexity of their patient observations, previous experiences of nursing, learned assessment skills, knowledge in human-bioscience and their immediate assessments, into an integrated hypothesis creation and learning process. We propose stimulated recall as a novel reflective learning activity to foster students' clinical reasoning and metacognition skills and achieve deep learning.

Abbreviations

EWS: Early warning score; NSD: The norwegian centre for research data; SRI: Stimulated recall interview; PAS: Physical assessment skills; SpO_2: Blood oxygen level; CNI-XII: Cranial nerves numbers 1–12; COPD: Chronic obstructive pulmonary disease; PCI: Percutaneous coronary intervention; L4: Vertebrae number 4 of the lumbar spine.

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Authors' contributions

KRB: study design, methodology, recruitment of participants, acquisition, transcription, data analysis and interpretation, drafting, editing, and critical revision of the article. TE: data analysis and interpretation, editing and revising the article. HE: study design, methodology, interpretation of data, editing and critical revision of the article. HÖE, LGH and AM: Study design, methodology and revising the article. EAB: study design, methodology, data analysis and interpretation, drafting and editing, and critical revision of the article. All authors read and approved the final manuscript and are personally accountable for the author's own contributions and ensure that questions related to the accuracy or integrity of any part of the work have been appropriately investigated and resolved.

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Availability of data and materials

Datasets used during the current study are available from the corresponding author on request.

Declarations

Ethics approval and consent to participate

The Ethical Committee of South East Norway (ref. number 2018/1697 A) performed a Remit Assessment of the study and determined it not needing further ethical approval as is was not considered medical or health research. The Norwegian Centre for Research Data (NSD) approved the study (Project No. 196758). The study was performed in accordance with the checklist for qualitative research: COREQ and followed the Helsinki Declaration. The participants in this study received oral and written information about confidentiality and voluntary participation. The participant gave written consent prior to researchers' attendance.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Author details

[1]Centre for Health and Technology, Faculty of Health and Social Sciences, University of South-Eastern Norway, Grønland 58, 3045 Drammen, Norway. [2]Department of Nursing Science, Faculty of Medicine, University of Oslo, Forskningsveien 2B, 0371 Oslo, Norway.

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Publisher's Note

Study 3

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ORIGINAL RESEARCH: EMPIRICAL RESEARCH - QUALITATIVE

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Newly graduated nurses use and further development of assessment skills—An in-depth qualitative study

Kirsten Røland Byermoen[1] | Espen Andreas Brembo[1] | H. Ösp Egilsdottir[1] | Tom Eide[1] | Lena Günterberg Heyn[1] | Anne Moen[2] | Hilde Eide[1]

[1]Centre for Health and Technology, Faculty of Health and Social Sciences, University of South-Eastern Norway, Drammen, Norway

[2]Faculty of Medicine, Department of Public Health Sciences, Institute for Health and Society, University of Oslo, Oslo, Norway

Correspondence
Kirsten Røland Byermoen, University of South-Eastern Norway, Drammen, Norway.
Email: kirsten.roland.byermoen@usn.no

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Abstract

Aims: To explore in-depth nurses' use and further development of assessment skills in different nursing contexts in the first 2 years after graduation, and factors that influenced their use and development of assessment skills.

Design: The study had explorative qualitative design.

Methods: Eight nurses who previously had been interviewed about their learning of physical assessment skills in clinical rotation as students participated in this follow-up study. Individual in-depth interviews were conducted, where the nurses spoke freely about their experiences after graduation.

Results: Four prominent features influencing the nurses' use and development of assessment skills were identified: (a) assessment approaches and readiness for practice, (b) the primacy of communication, (c) recognition related to performing assessments, and (d) the influence of organizational factors on their assessment applications.

Conclusion: Newly graduated nurses' use of assessment skills is an important part of providing holistic care. This study suggest that assessment skills is not only an assessment task but is central in relationship building and in supporting the professional development of nursing competence.

Patient or Public Contribution: No Patient or Public Contribution, due to study design.

KEYWORDS
clinical judgement, fundamental care, new graduate nurses, nursing, patient assessment, professional competence, professional development

1 | INTRODUCTION

Professional nursing competence is a complex integration of knowledge, including professional judgements, skills, values, attitudes, and holistic thinking. This is a fundamental requirement in the provision of high-quality and safe patient-centred care (Fukada, 2018). Clinical assessment is a complex process including a variety of assessment skills used to evaluate a patient's health status (Taylor et al., 2021). In this study, the concept of assessment skills includes physical assessment as well as clinical reasoning and considering appropriate action alternatives. Newly graduated nurses consider clinical assessment a part of their role, but many lack preparedness and confidence (Taylor et al., 2021). Moreover, it has frequently been reported that nurses do not apply the full range of assessment skills learned during nursing education (Tan et al., 2021). This calls for revisiting newly graduated nurses' development of assessment skills as a part of nursing competence.

2 | BACKGROUND

Reported barriers for nurses' lack of assessment skills are multifaceted and include role ambiguity, reliance on technology, lack of

collegial support and culture, insufficient time to practise, lack of impact on patient outcome, absence of a unified documentation system for performed assessments, and lack of confidence and knowledge (Tan et al., 2021; Taylor et al., 2021). These barriers are important to understand and address in undergraduate nursing education programmes. Nursing students' practice of assessment skills is influenced by opportunities for peer learning, and students' own ability to make use of experiences from prior clinical encounters. Moreover, factors influencing students' learning and confident use of assessment skills in clinical practice include articulating reasonings in relation to human bioscience; doubting whether their assessments have an impact on patient care; and having engaged and competent role models who expect students to perform assessment skills (Byermoen et al., 2021; Douglas et al., 2015; Egilsdottir et al., 2019). How assessment skills are further developed after graduation needs exploration.

In general, nurses' professional competence increases with experience in the first years after graduation. At the time of graduation, nurses are in a process of movement, from the periphery towards the core of their working community. This happens through learning and aligning their own performance in the work environment (Numminen et al., 2017). However, nurses may find it difficult to adjust to working in the clinical environment following graduation, due to a lack of readiness, overwhelming new role responsibilities and low perceived confidence (Aldosari et al., 2021). Specifically, a lack of confidence in recognizing and preventing patient deterioration has been identified as a significant factor (Taylor et al., 2021). Trusting own performance of assessments, reasoning processes and confidence when articulating findings is based on nurses' bioscience knowledge. Compassionate care and gained patient trust have been identified when nurses articulate their assessments and judgements to their patients (Montayre et al., 2020). However, new nurses need support around the transition to practice, the development of competence descriptions, professional behaviour and the reflection on knowledge and skills (Kukkonen et al., 2020).

There are few qualitative studies that explore how newly graduated nurses develop and make use of assessment skills in different clinical contexts, and in particular how they experience the process of continuous learning.

2.1 | Assessment skills and the fundamentals of care framework

Person-centred care is a core competence underpinning all nursing care (Kitson et al., 2013; McCormack & McCance, 2017). The Fundamentals of Care Framework takes the dimension *'therapeutic nurse–patient relationship'* as a point of departure for performing person-centred care (Kitson et al., 2013).

'Integration of Care' represents another dimension of the Framework, and consists of nursing care activities, involving the integration of physical, psychosocial and relational aspects of patients' individual fundamental care needs. The final dimension, *'Context of Care'*, consists of the system and policy requirements needed to support the delivery of fundamental care; factors influencing nurses' ability to provide fundamental care include resources, culture, leadership, evaluation and feedback, financial incentives, quality and safety agendas, governance processes, regulation and accreditation (Kitson, 2018). Feo et al. (2017) emphasize evaluation of the relationship dimension as critical, as it provides nurses with informed feedback on their ongoing activity. By evaluating patients' care and expectations, the nurses can determine whether these have been met or if new expectations have arisen.

To evaluate patients' needs holistically, assessment skills are needed. Egilsdottir et al. (2022) identified increased confidence in using physical assessment as a central part of overall nursing competence during nursing students' clinical rotation courses. The Framework addresses key prerequisites for nurses' person-centred clinical practice related to meeting patients' fundamental needs, and it will be used in this study to discuss the findings with a theoretical perspective.

What problem did the study address?

Current research suggests that newly graduated nurses are not adequately prepared to cope with the complex situations they encounter in clinical practice. Workplace environment and patient care requirements influence nurses' overall use of assessment skills. There is limited research exploring the further development of assessment skills after graduation as an essential part of nursing competence.

What were the main findings?

Our main findings are that the nurses described (a) relationship building and communication as key features of their assessment approach; and (b) a need for recognition in a motivating and supportive workplace environment.

Where and on whom will the research have impact?

Study findings suggest that nurse managers should support newly graduated nurses' transitional phase when entering the clinical work environment; they also emphasize how mentorship can scaffold nurses' continuing learning process. Educators can benefit from this study when designing educational programmes by better preparing students for practice.

3 | THE STUDY

3.1 | Aims

The aim of this study was to explore in-depth (a) nurses' use and further development of assessment skills in different nursing contexts in the first 2 years after graduation; and (b) factors that influenced their use and development of assessment skills.

3.2 | Design

The study had an explorative qualitative design with a phenomenological-hermeneutical approach (Lindseth & Norberg, 2004). The consolidated criteria for reporting qualitative research (COREQ) were used to report the findings of this study (see Data S1).

3.3 | Participants

Data were collected in March and April 2021. Eleven nurses who had participated in two previous studies (Byermoen et al., 2021; Byermoen et al., 2022) were invited to take part in this final follow-up study; approximately 21 months after their graduation. We sent an e-mail with detailed information about the study and a consent form. To participate, the nurses were asked to respond to the e-mail and attach a signed consent form. Eight nurses agreed to participate.

3.4 | Data collection

The first author conducted individual interviews with the nurses. A thematic interview guide was developed, covering three main thematic areas of interest: (a) workplace environment, (b) patient care requirements, and (c) assessment skills. Qualitative interviews entail a social interaction between the interviewer and the interviewee, in which knowledge is constructed (Creswell & Poth, 2018). Due to the nurses' acquaintance with the interviewer as a researcher in the two previous studies and as a faculty member throughout their education, the interaction during the interview built upon these mutual experiences. The interviews were conducted in the form of a conversation to enable the nurses to talk freely about their experiences as a nurse, from graduation until the present time. The interviewer used open-ended questions and probes throughout the interview to stimulate the nurses to elaborate their accounts and to achieve an in-depth exploration of their experiences related to the themes in the interview guide. All individual interviews were conducted via the videoconference system Zoom or telephone (due to COVID-19 restrictions) and lasted between 44 and 70 min (with a mean of 57 min).

3.5 | Data analysis

Audio-recordings from each interview were transcribed verbatim by the first author. KRB, TE and EAB conducted the analysis according to the phenomenological-hermeneutical method for interpreting interview texts, as described by Lindseth and Norberg (2004). Figure 1

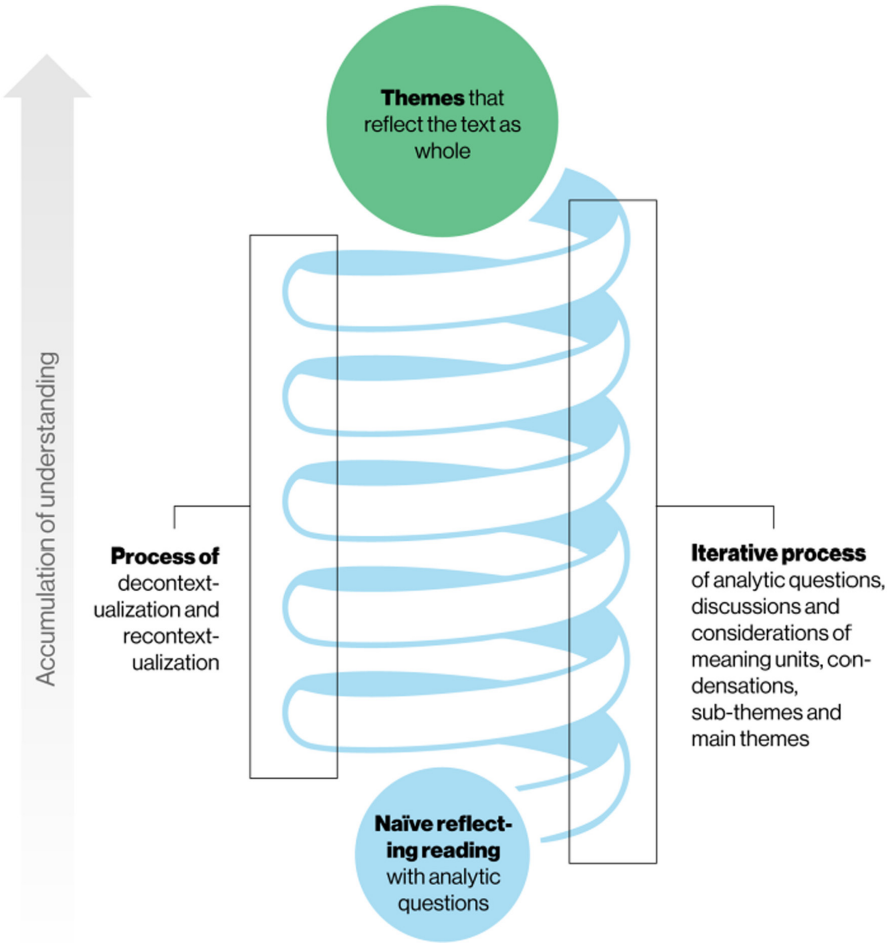

FIGURE 1 Phenomenological-hermeneutical analysis process.

illustrates the process of analysis, starting with naïve and reflective reading. The further process was iterative and involved cycles of repeated reading, and processes of decontextualization and recontextualization. Meaning units were adjusted and condensed into sub-themes, where main themes was constituted once it was considered to reflect and represent the comprehensive understanding of the text as whole.

3.6 | Ethical considerations

The National Centre for Research Data assessed the data processing plan to be in accordance with data protection legislation (Project No. 302694). The nurses received information and invitation to participate in the study upon meeting the researcher emphasizing the right to withdraw from the study at any time, and that all data would be handled confidentially.

3.7 | Rigour

Rigour was ensured by critical reflexivity throughout the entire qualitative research process of study planning, data collection, analysis and reporting of the findings (Cypress, 2017). Also, the phenomenological-hermeneutical approach supported rigour through the accurate depiction of the nurses' lived experiences. When conducting the interviews, the first author sought to create an explorative atmosphere and maintain good rapport by active listening, awareness to nonverbal cues, showing empathy and understanding when the nurses shared unpleasant experiences. A promoting factor for this was the fact that the nurses knew the researcher from earlier when they were students and took part in the two previous studies. The analysis was performed by a complementary researcher's team with different scholarly backgrounds (i.e., nursing, communication, health services research, ethics, psychology and educational studies), and included both women and men. This strengthened the reflexiveness of the study, reduced the researchers' intersubjective interpretations and ensured that the nurses' perspectives and experiences were understood and reported in-depth.

4 | FINDINGS

Table 1 provides an overview of sample characteristics. Five were women, and four had worked in the same unit after graduation, while the remaining four had changed workplace at least once. Workplace settings varied from surgical and medical hospital wards (three), home care (two), an acute outpatient clinic (one), psychiatry (one) and substance abuse care (one).

The phenomenological- hermeneutical analysis of the in-depth interviews enabled exploration of the nurses' use and development of assessment skills (as presented in Table 2), yielding the following themes: (a) assessment approaches and readiness for practice, (b) the primacy of communication, (c) recognition, and (d) organizational factors.

4.1 | Assessment approaches and readiness for practice

The nurses reported a great variety of assessment approaches, but also a diversity of lived experiences concerning their readiness to use assessment skills.

4.1.1 | Variety of assessment skills

The nurses described using various approaches to structure their assessments, such as the face, arm, speech, time (FAST) algorithm,

TABLE 1 Characteristics of the participant sample.

Background information	Age range[a]	Health-related work experience prior to education start (years)	Health-related work experience during education (shifts/week)	Number of workplaces after graduation	Current workplace	Workload
Nurse 1	2	0.5	2	3	Acute home remote alarm central	100%
Nurse 2	1	2.5	2	1	Acute psychiatry	100%
Nurse 3	3	0	0	4	Surgical intermediary hospital unit	100%
Nurse 4	1	6	2.5	1	Surgical unit	100%
Nurse 5	2	0	2	1	Acute outpatient clinic	100%
Nurse 6	1	6	2.5	1	Home care nursing	100%
Nurse 7	2	5	2	1	Medical hospital unit	80%
Nurse 8	3	0	0	2	Substance abuse hospital unit	100%

[a]Age range: 1: 26–29 years old; 2: 30–39 years old; 3: 40–47 years old.

TABLE 2 Nurses' use and development of assessment skills after graduation.

Sub-themes	Themes
Variety of assessment skills	Assessment approaches and readiness for practice
Readiness for practice	
Experiencing uncertainty	
Dealing with uncertainty	
A Sherlock Holmes approach	The primacy of communication
Explorations through communication	
Building trust	
Collaborating with patients' next of kin	
Recognition from preceptors during nurses' education	Recognition
Recognition from nurse managers	
Recognition from colleagues	
Recognition from patients and their next of kin	
Workplace environment	Organizational factors
Encouraging culture	
Workload	
Collaboration with other health professionals	

physical assessment skills, early warning score (EWS) assessments, and electronic devices, which guided their clinical reasoning: '*These are things that flow through the filtering process when I assess a patient*' (N8). One nurse described how the severity of a patient's current clinical situation determined how assessments were elicited: '*We do not use the EWS in those cases; we have a more intensive care surveillance where we assess respiratory and circulation, blood pressure, heart rate. Then we assess everything – dry and warm skin, temperature, hourly diuresis, consciousness*' (N3). Further, another nurse emphasized that using a systematic assessment approach had evolved as an ongoing process, towards internalization into routine nursing practice: '*Now I perform a partial physical assessment on them, just on autopilot*' (N4).

4.1.2 | Readiness for practice

The nurses perceived that the nursing programme had provided them with the sufficient basic nursing competence to continue their further development as registered nurses. One of the nurses articulated it in this way: *'I feel I was ready to start and to continue my development'* (N7). However, the period just after graduation was characterized by a steep learning curve: *'Because now you must contextualize everything'* (N4). With many new and complex daily nursing routines, some nurses underlined the difficulty of knowing the full extent of their assessment tasks. One nurse described how she handled this: '*So you are kind of a marionette and do as you are told without opposing*' (N4).

With time, the nurses experienced an emerging sense of development in using assessment skills to understand the nature of the patients' situations: '*It's a lot to observe at the same time, and I feel this has evolved eventually over time*' (N4). Some of the nurses stressed that they wished they had been given more time to explore and integrate theoretical knowledge in clinical practice during their education: Specifically, '*to know how to explain your observations, and how rapidly you can identify them*' (N7). One nurse suggested that more use of the on-campus simulation centre would help with practising theory–practice integration, and with further exploration of their own understanding in the learning process: '*It's an arena to integrate different sources of knowledge*' (N3).

4.1.3 | Experiencing uncertainty

Most of the nurses seemed to experience the confident use of assessment skills as challenging, on multiple levels. One nurse working at a psychiatric unit spoke about the sudden transition from being an assistant nurse with less responsibility to being the one in charge of making decisions about coercive measures: '*Then I'm the one who assesses if there is a need for restraints*' (N2). Another nurse found it challenging to trust her own assessments so early on in her professional career: '*And then being the one responsible to assess, "Is this acute enough to contact the physician or should we wait and see a bit longer?" It's so difficult to assess alone*' (N6). Moreover, the nurses experienced it as challenging to remember all the skills in stressful situations, and then determine which to select. One nurse described an experience in which she realized that she could have auscultated a patient's thoracic wall while waiting for an ambulance: '*And then I became a little annoyed, because this was something I really should have done while waiting*' (N6).

4.1.4 | Dealing with uncertainty

Memorizing assessment skills became a strategy to master responsibilities in the first period as a nurse, following graduation: '*You need to automate what to apply to have the capacity for higher order thinking, to reflect and see connections*' (N3). Knowing the patient from previous encounters enabled comparison of assessments, which was beneficial for nurses' reasoning process: '*So it's more of a whole, but focusing on what is different compared to yesterday*' (N3).

Most nurses described having a continuous focus on assessment skills and making use of opportunities to develop their own assessment competence: '*For me, I need to go into conversations [with colleagues] and ask, "Yes, but what did you do specifically?", so I can learn even more*' (N6). Another nurse highlighted opportunities to practise assessment skills in her daily nursing routines: '*There are good opportunities to do clinical reasoning during morning care*' (N7). More experience through future patient encounters was highlighted as central for the nurses' continuing development: '*I do still have many patients to meet for the first time*' (N6).

One of the nurses explained how similar experiences made her more confident, as she recognized progress in her abilities to perform

and act on her own assessments: '*I've kind of seen that I've had a very strong development […], made good clinical judgements and been able to act upon them*' (N3). This type of experience broadened the basis of nurses' judgement process, leading to early detection of patients' health deterioration. Another nurse shared an experience she had during a home visit, when auscultation of the patient's thoracic wall revealed a clear sign of pneumonia: '*The general practitioner decided to prescribe antibiotics for pneumonia directly, without demanding that the patient travel to the doctor's office*' (N6).

4.2 | The primacy of communication

A common experience highlighted by all informants was the primacy of communication and the need to establish a mutual relationship with the patient in order to perform a successful assessment. The nurses emphasized different aspects concerning how they used communication as part of their assessments: Exploring through communication, building trust, and collaborating with patients' next of kin. However, a common feature across communication skills and strategies was having a fundamental interest and maintaining an investigative attitude.

4.2.1 | A 'Sherlock Holmes' approach

Some of the nurses reported that their approach for collecting patient information was characterized by curious, systematic observation, by using careful listening and thorough assessment, not unlike a 'Sherlock Holmes' approach. Having a variety of possible assessment approaches, one of the nurses shared reflections about how important it is to start with an open, investigative mindset, and not to be too hasty in the quest for answers: '*I try to not draw conclusions too quickly*' (N1). Moreover, they needed to identify and connect distinct cues by integrating different knowledge-bases as part of their assessments. One nurse explained this further, referring to a patient who felt ill: '*I need to really consider the reasons why he [the patient] feels nauseated, and not only dispense an antiemetic drug. I need to find the cause*' (N7). The nurses described the necessity of not only assessing the patients' present health condition and providing immediate assistance, but also to explore and analyse potential underlying factors, to assess what may be expected to occur in the future, and to take necessary precautions. As one nurse explained: '*You should find out what's happened and consider what may be done to prevent it from happening again*' (N1). Doing so enabled this nurse to gain a holistic understanding of the situation: '*It might be easier to get the whole picture*' (N1). Moreover, the detailed observation also included the patients' physical living environment, representing an indirect (but important) source of information and object of interpretation: '*You can see if there's been a lack of cleaning, which may suggest that the patient is not coping that well in their home*' (N1).

4.2.2 | Explorations through communication

The nurses emphasized explorative communication as a key skill and as a central part of their assessments, guiding their steps and judgement process. They described how they explored the patients' health situations by simultaneously listening to verbal expressions, observing non-verbal gestures and bodily reactions, as well as performing assessments:

> 'You observe how the patient appears: Does he seem to be in pain? Is he sad? Is he happy? Is he pale, does the skin look normal, does his face blush? Is he lying down looking worried? Does he touch spots on the body? And then also what he expresses verbally' (N4).

Through active listening, the nurses could notice cues reflecting patients' concerns; these guided their explorations of the patients' situations, and their decisions regarding which assessments to perform: '*Then I try to start off with eliciting their own experience – what's bothering them. Because then I can determine where to start*' (N6). Some nurses described communication with the patients as a decisive factor in their ability to provide them with a clear, predictable plan for assessments, treatment and care. One nurse stated: '*My experience tells me that the patients need clarity*' (N3).

4.2.3 | Building trust

The nurses stressed the importance of building trust with their patients and described several approaches. One nurse emphasized being highly self-aware about how he appeared in the patient encounter because '*it is a key task to convey trust*' (N1). The nurses explained the importance of demonstrating their availability to the patients by clearly stating that they are welcome to make requests at any time. As one nurse stated, '*I give them the opportunity to approach us whenever they want or need*' (N2). The nurses sought to meet whatever their patients found important by inviting them to share their thoughts and feelings –and by validating them. Here, one nurse described her approach: '*I let them disclose anything they want and might respond in ways such as, "Yes, I understand that this is difficult for you, or I understand that this hasn't been good for you…" and then I think it's easier*' (N3).

The nurses also reflected on the importance of non-verbal communication in order to identify patients' needs. One nurse referred to a situation with an Arabic-speaking patient, with whom the nurse had no common verbal language. The patient was delirious and agitated, and for several days he had been afraid of being killed by the staff during his hospital stay. However, the nurse assessed his anxiety to be a main problem, and managed to calm him down through persistent empathic, non-verbal interaction: '*We had a lot of communication without speech*' (N3). Following this situation, the nurse was unsure whether her efforts to meet the patient's needs were

successful. However, the patient's son expressed (unsolicited) that his father was deeply grateful:

> 'He speaks so nicely about you that I do not even know all these old Arabic words, because it is so solemn and grand what he says about you. Allah will take good care of you, and you are a unique person' (N3).

The nurses described how the process of establishing trust with the patient facilitated a successful assessment and subsequent clinical reasoning process, as well as their ability to identify patients' expressed concerns and needs. One nurse explained: '*They leave you with a feeling of having been adequately assessed*' (N5).

However, the nurses also described situations where they were unable to meet patients' expectations and provide care that complied with specific requests or needs. One nurse stated: '*It's frustrating to handle, because you really want to help. But sometimes it's not always that what the patient wants is possible to offer as help*' (N5).

4.2.4 | Collaborating with patients' next of kin

Collaborating with the patients' next of kin was stressed as essential to the overall quality of care and assuring patients' safety: '*Sometimes next of kin share information not previously known to us*' (N7). Next of kin were considered to be important collaborators who could provide vital information about the patient. As one nurse explained: '*Not all patients can articulate their own thoughts*' (N6). The nurses highlighted the importance of also being attentive towards the next of kins' needs and offering them support: '*It's important that we also see them and take care of them, as well*' (N6). However, this was described as a balancing act—as time spent on patients' next of kin could compromise the amount of time available with the patient. One of the nurses expressed how prioritizing both could become a somewhat competing endeavour, because '*they require a lot of time and we have so much to do*' (N7).

4.3 | Recognition

Using and further developing assessment competence was highly influenced by receiving recognition through feedback from others on several levels: Recognition from preceptors during the education, recognition from nurse managers, recognition from colleagues, and recognition from patients and their next of kin.

4.3.1 | Recognition from preceptors during nurses' education

The nurses highlighted the relevance of recognition from preceptors whilst they were students. In particular, the recognition they received concerning their performed assessments and reasoning processes was central to their experience of learning—this recognition occurred in regular reflections with their preceptors. One nurse described how conversations enabled her to articulate her knowledge and check her own understanding: '*I did actually learn very much during those conversations I had with my preceptor*' (N4). Experiencing a safe learning environment, with encouragement to practise assessment skills during clinical rotation, was emphasized as critical for competence development. One nurse reflected on a situation that had proved significant for her development, when her preceptor had suggested: '*You should approach all these patients and ask permission to perform a structured assessment*' (N4). Some nurses had experienced preceptors who used assessment skills as an integrated part of their nursing practice, while others did not. One nurse explained that she never had the chance to observe and learn from a preceptor performing assessment skills beyond the EWS: '*I've never had a preceptor that's showed me how to perform it, like a professional*' (N6). This is an example of how experiencing an earlier lack of acceptance around and recognition of performing specific assessment skills made it challenging for nurses to properly use physical assessment skills in daily routines.

When reflecting on their use of assessment skills, the nurses spoke about their journey from being a nursing student towards becoming a registered nurse. They emphasized the desire to not only be a competent nurse who confidently uses assessment skills to anticipate changes in their patients' condition, but also to be a competent preceptor and role model who scaffolds nursing students' use of assessment skills. As one nurse stated, *'I'm trying to be the preceptor that I did not have myself'* (N6).

4.3.2 | Recognition from nurse managers

The nurses described how their nurse managers' recognition influenced their development of assessment skills as a part of their nursing competence. The nurses highlighted how nurse managers who were easily accessible on the unit could provide timely guidance concerning issues arising in their daily work. One nurse explained: '*The staff development nurse in particular is available to answer questions*' (N7). Recognition through structured feedback from nurse managers was pointed to as having significant impact, regarding feeling safe in one's work and continuing to develop. One nurse spoke about her experience with an absent nurse manager and a lack of feedback: '*And if the manager is not visible and present on the unit and wants to follow up, then I think it's a bit tough*' (N3). Those who had close follow-up from their nurse manager described having achieved a mutual understanding regarding expectations and were assigned tasks they felt were appropriate for their own competency level: '*So they really take into consideration what you feel yourself*' (N3).

However, the nurses emphasized the importance of having nurse managers who placed nurses' use of assessment skills on the agenda. Nurse managers were perceived as being in position to give clear expectations concerning the nursing staffs' use of assessment skills, and to implement strategic plans for assessment competence on the unit. One nurse stated: '*Here, I think the nurse*

managers have an important role – they need to decide "Now, we are going to do this"' (N6).

4.3.3 | Recognition from colleagues

The nurses perceived peer nurses, nurse practitioners, nurse assistants, physicians, pharmacists, and other health professionals in their unit as colleagues. Being recognized as an equal contributor during patient assessments was seen as central in interprofessional collaboration. One nurse expressed it in the following way: '*If you are a nurse, physician, psychologist – it does not matter. What you say is important'* (N8). This acknowledgement made it easier for the nurses to discuss clinical queries or ask colleagues for help during patient encounters. As one nurse stated, '*That threshold is almost non-existent. That's really good'* (N5). This was a prominent feature, as most of the nurses stressed that discussions with colleagues about patient care enabled them to articulate clinical reasonings: '*I need to think aloud with someone about "Yes, now you are on to something" or "These were good assessments"'* (N3). One nurse explained how discussions with colleagues could lead to reflections on her own actions: '*We can sit down and talk: "Did I do this right?"'* (N6). With this, the nurses described that peer learning was central to their ongoing learning process: '*It's a bit like, one day you are the tutor; the next day you are the student'* (N1).

4.3.4 | Recognition from patients and their next of kin

All of the nurses described that recognition and feedback through patient encounters or their next of kin influenced their development: '*If you get feedback from next of kin or patients – "You did a good job" – of course, that contributes to defining me as a nurse'* (N6). Through encounters with patients, they developed the ability to self-affirm through reflecting on what went right in a given situation. Here, one nurse provided an example of one such affirmation: '*No one on the ward has died yet. No one has had a serious tamponade, no one we have had to revive. Nothing bad has happened. "Okay, I'm going to persevere here; it's going to go well somehow"'* (N3).

4.4 | Organizational factors

The nurses described how organizational factors influenced their use of assessment skills. Four factors were identified: Workplace environment, encouraging culture, workload, and collaboration with other health professionals.

4.4.1 | Workplace environment

The workplace environment had an impact on the nurses' continued use of assessment skills. The nurses explained that their assessment competence was not a fully achieved competence from their nursing programme, nor from their current workplace environment. Further assessment competence would be lost if they did not use it in their daily nursing. Here, one nurse described having lost much of what was previously learned, due to limited opportunities to maintain the necessary skills: *'I feel that those assessment skills diminished when I did not use them'* (N1). Sudden changes of clinical workplace environment required some to prioritize other skills and knowledge. One nurse described having been relocated as a consequence of the COVID-19 pandemic from an intermediary surgical ward to a newly established COVID unit. Recognizing that she needed to use other aspects of her assessment approach led to an experience of uncertainty: *'I was quite stressed again in a way, because I do not really know how quickly things can deteriorate'* (N3).

4.4.2 | Encouraging culture

The nurses emphasized how the culture of their unit influenced their use and development of assessment skills. One nurse described it as crucial to have mutual understanding about what was expected of their assessment competence: '*If it's not an expected nursing task, then we will not use it, right?'* (N7). Most of the nurses described an understanding that specific assessment skills such as auscultation, were not fully accepted as part of a routine nursing assessment. Auscultation was regarded as the task of the physician, which was the nurses' main reason for not using this assessment skill. One nurse spoke about a situation where he omitted to auscultate: '*I wanted to listen on the patients' thoracic wall, but another nurse says: "No, you don't have to do that – that's the physicians' job"'* (N1).

4.4.3 | Workload

Some nurses pointed to an imbalance between achieving their personal goals and meeting demands, where the overall workload in their unit affected their use of assessment skills and further reasoning processes. One nurse described how the workload compromised her expectations own nursing:

> 'I feel there are so many nursing tasks, and it is so difficult to grasp what's most important. I feel I am getting pulled. I have responsibility for the sluice room, I do also have responsibility for the patient safety, performing EWS assessments, administrating antibiotics, and everything, sometimes everything collapses. [...] There have been some shifts where I have gone home crying, to be honest. Because I feel so guilty, I work so hard, but I do not have enough time to complete my tasks' (N7).

The organization of care teams influenced the overall work burden, and consequently also the nurses' use of assessment skills. As an

example, a team-based nursing model often assigned a nurse the responsibility for twelve patients during a shift. This resulted in: '*There is no chance for performing assessments. I felt quite insecure* ' (N7). However, the same nurse had started to work in another unit. The new unit emphasized primary based nursing as model of care, where nurses had responsibility for a fewer number of patients that enabled a holistic approach where she experienced: '*I feel that I have much more capacity to have overview of my patients when it is primary care nursing*' (N7).

4.4.4 | Collaboration with other health professionals

The nurses that collaborated with health personnel working at other healthcare sectors could challenge their use of assessment skills. One challenge centred around effective collaboration, which required reaching a shared understanding of each other's roles and responsibilities: '*And when the paramedics arrive, it's not often that they trust our assessments, so they start up doing their own again. So, there's a kind of an assessment war*' (N1). The different understandings of and approaches to using assessment skills among health professionals in different sectors may explain some of the challenges that arise during collaboration. Here, one nurse in an acute out-patient clinic reflected on how municipal nurses are only trained to use the EWS score when reporting data: '*When the home care or nursing home personnel calls [the acute out-patient clinic], they are so concerned with the EWS score, but that does not tell me anything*' (N5). This same nurse noted that the articulation of clinical reasonings beyond vitals was valuable information about the patients' condition: '*That the patient is breathing heavily, has this in vitals, and you hear crackles over the lungs – that is golden information, right?*' (N5). This kind of information would enable other health professionals' clinical decision-making during patients' transfer between health services.

5 | DISCUSSION

Our most prominent findings are that the nurses described building trust and communication as key features of their assessment approach; and that they expressed a need for recognition in a motivating and supportive workplace environment. In the following section, we will discuss the findings in light of the Fundamentals of Care Framework and other empirical studies.

5.1 | Assessment as a premise for providing person-centred fundamental care

Establishing an interpersonal relationship was a crucial starting point for the nurses´ assessments, where the primacy of communication was emphasized as a necessary aspect. Nurses use communication skills to build rapport, and to elicit and interpret cues and patients' expressed concerns (Zambas et al., 2016). Basic communication skills have shown to be paramount for nursing students' learning of assessment skills. Sufficient time to practice enable students to take patients' perspectives and needs into account through a more holistic and symptom-based approach (Byermoen et al., 2021; Byermoen et al., 2022). Our findings show that the quality of the nurse–patient relationship during communication also influences nurses' assessment processes.

Relationship building is at the core of the Fundamentals of Care Framework, entailing the nurse to (a) develop and maintain trust, (b) be focused (c) anticipate needs, (d) get to know the patient, and (e) evaluate the quality, progress and quality of the relationship (Feo et al., 2017). Our findings suggest that nurses' performance of high-quality and focused assessments represent a unique strategy to achieving a well-functional relationship. The nurses provide continuous, undivided attention to the patient, they anticipate and resolve the patient's changing needs, and through the integration of communication skills, they get to know the patient on a deeper level, including how illness influences them. These findings add new insights into how explorations through communication during nurses' assessments contribute to person-centred fundamental care.

The nurses in this study described being aware of the importance of relationship building as part of their assessment approach. This awareness also enabled them to elicit patients' needs by initiating appropriate interventions through their reasoning process. Kitson (2018) has noted that many nursing activities may be considered more as complex technical tasks than the provision of holistic care for patients. This point of view may be questioned, as technical skills (e.g., physical assessment skills) are not found to exclude the possibility of a holistic approach, but rather strengthen and complement each other in the provision of high-quality nursing care (Montayre et al., 2020). In line with these studies, our findings suggest that nurses' assessments promote integrated person-centered care.

5.2 | Factors influencing nurses' use and development of assessment skills

The nurses described the daily nursing context as influential for their opportunity to perform assessment skills and levels of reasoning processes. The use of assessment skills was not reported as a nursing competence obtained primarily through their education; instead, the nurses emphasized that their competence and confidence in assessment skills would be lost if they did not use them in their current workplace, and this was something that they needed to work on continuously whilst being supported in new contexts. This was because their ability to elicit which assessment skills to use during patient encounters, and their awareness of possible information sources, differed between clinical contexts. These findings are not new, as prior research emphasizes that clinical contexts and patients' clinical condition may influence the extent to which nurses use assessment skills, further contributing to their overall development process (Taylor et al., 2021). However, there is a need for further research that investigates how nurses' assessment competence can flourish

and continue to evolve within different clinical contexts. This study suggests that assessment competence should become an integrated part of an organizational culture characterized by interprofessional collaboration that recognizes the value of high-quality assessment competence.

The Context of Care dimension of the Fundamentals of Care Framework is regarded as important in supporting nurses' ability to provide fundamental care (Kitson et al., 2013). Newly graduated nurses are often uncertain regarding their own skills and competence, and are prone to adopt both best and less-optimal practices occurring as part of the workplace culture and routines, as colleagues represent important sources of knowledge and advice (Taylor et al., 2021; Voldbjerg et al., 2016). Establishing assessment skills as best practice in the workplace environment has been shown to support newly graduated nurses' competence development after graduation (Numminen et al., 2015; Taylor et al., 2021). In our study, the nurses described how a supportive work environment that recognized their competence fostered their use of assessment skills and further development. They pointed to recognition as an important factor in their further development of assessment skills. The psychological dimension of recognition as a concept captures a person's need for feedback as validations to enable learning and development, assuming that in order to develop a practical identity, persons fundamentally depend on appropriate feedback of others (Iser, 2019). The newly graduated nurses experienced recognition when they were included as an equal contributor in their collaboration with colleagues, concerning discussions of patients' treatment and care. Receiving peer-recognition facilitated their motivation to further use and develop new assessment skills. Correspondingly, interprofessional collaboration is reported to be of great value for learning, as it initiates reflections and further development of knowledge through discussions (Byermoen et al., 2021; Taylor et al., 2021). Working in a team and sharing responsibility has been found to contribute to nurses' development of reasoning skills and clinical judgement (Numminen et al., 2015). Through collaboration and in a supportive workplace environment, nurses' use of multiple knowledge sources through critical thinking, questioning and articulation is nurtured (Voldbjerg et al., 2016).

The nurses also reported that their managers' attitudes and prioritizations influenced the workplace culture regarding what was considered relevant for a nurse to master, and what high-quality assessment competence entailed. Leadership style—at the individual and the unit level—was regarded to be of substantial importance. A recent study found that nurse managers expect newly graduated nurses to have the necessary competence to identify clinical changes and thus ensure patient safety and quality of care (Kukkonen et al., 2020). However, expectations alone are not enough, as nurse managers also have an important role in supporting nurses' transition to practice. They must take the lead in creating a culture that embraces and facilitates competence development and skills performance (Kukkonen et al., 2020). Nurse managers are in a position to set the standards for an organizational culture (Kukkonen et al., 2020; Mudd et al., 2022). However, Mudd et al. (2022) report that while nurse managers emphasize a desire to support their nursing staff to deliver fundamental care, they lack clear strategies for how to achieve this. Based on the findings in our study, we encourage nurse managers to develop strategies that ensure that newly graduate nurses are included in the new work environment. Further, we suggest that nurse managers inspire nurses to actively use their learned assessment competence, provide feedback that supports nurses' further development, and facilitate routines for peer reflection in the current context of nurses' adequate knowledge and skills.

5.3 | The process of developing competent assessments

The nurses described having low confidence in using assessment skills in the first period after graduation. One typical example was uncertainty in trusting their own choice of assessment skills and actions to perform. A common strategy was to memorize assessment skills mostly used on the unit, or to rely on prior experiences with their patients. Unexperienced nurses' intuition is often based on prior encounters, rather than on articulating what they have assessed (Dalton et al. 2018). While newly graduated nurses have adequate knowledge and skills, they lack confidence when starting their professional career (Masso et al., 2022). The nurses in our study expressed the importance of learning to become confident in determining which assessments to use in new contexts in their nursing practice. Moreover, the nurses also expressed person-centred perspectives, such as the need to develop awareness, and to recognize the whole rather than focusing on one part, to fully understand a patient's health situation holistically. This understanding underlines how nurses experience a gradual evolution towards holistically comprehending the patients' situations (Nour & Williams, 2019).

Despite the nurses' varying experiences regarding developing confidence in assessment skills, the above findings contribute novel insights into professional development processes of assessment skills. Their development process do align with what could be called to be in an advanced beginner stage (Benner, 1984). Nursing students' development processes seemed to be moving from insecurity when eliciting and performing specific assessment skills towards having an internalization when using assessment skills (Byermoen et al., 2021; Byermoen et al., 2022). When entering the professional nursing role, some of the nurses in this study seemed to deepen this internalization, employing a more holistic approach by grasping the entirety of the patient's situation and using a more analytical investigating method—not unlike a 'Sherlock Holmes' approach (Sopeña, 2014). One example was the ability to integrate different information sources, connecting the patients' past and present condition and anticipating future changes. The nurses transformed and developed their expertise in assessment skills by making sense of theoretical knowledge, internalizing new clinical knowledge, and acquiring clinical skills. This aligns with how experiential learning supports higher levels of knowing which specific skills to use (Zambas

et al., 2016). This understanding of nurses' proficiency development through experience requires the clinical field to support newly graduated nurses' further development after graduation. Close mentoring from more experienced nurses and nurse managers who emphasize specialized knowledge is thus needed when nurses enter new care contexts—regardless of how many years have passed since graduation.

5.4 | Strengths and limitations

A clear strength of this study is the temporal learning dimension of nurses' development and use of assessments skills in patient encounters. However, our findings are limited by the few clinical contexts studied, and there is a need for research addressing how nurses can succeed in integrating appropriate assessments skills in nursing practice across contexts. We suggest that, regardless of nurses' varying use of assessment skills, findings are relevant across nursing contexts, as we have identified core factors that facilitate or hinder nurses in identifying and meeting patients' fundamental needs through assessments.

Concerning sample size and obtaining information power, as defined by Malterud et al. (2016), it can be questioned whether our sample size was sufficient. As we aimed to explore nurses' assessment skills development and use in a longitudinal perspective, we believe that the inclusion of eight participants from our two prior studies (Byermoen et al., 2021; Byermoen et al., 2022), together with the rigorous data analysis, provided sufficient information power.

6 | CONCLUSION

This study revealed newly graduated nurses' use and development of assessment skills to be an integrated part of person-centred fundamental nursing care. The nurses used person-centred actions—such as relationship building and communication—as a central part of their assessment approach. Their integration of person-centred features in their assessment skills reflected a holistic approach. However, nurses need recognition and support in their work environment to continue the development of assessment competence after graduation. This study suggests that newly graduated nurses' use of assessment skills is not primarily an assessment task, but instead supports their professional development of nursing competence and their provision of fundamental care to patients.

Given our findings concerning how the organization influences newly graduated nurses' use and development of assessment skills, more research is needed to explore the perspective of workplace environments and how newly graduate nurses' use of assessment skills can be better supported. We propose further that the Fundamentals of Care Framework can be explored in different nursing contexts, and that assessment skills are an integral part of nursing competence and fundamental care, regardless of the patients' clinical condition.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*): (1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content. * http://www.icmje.org/recommendations/. All authors read and approved the final manuscript and are personally accountable for the author's own contributions and ensure that questions related to the accuracy or integrity of any part of the work have been appropriately investigated and resolved.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

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DATA AVAILABILITY STATEMENT

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

ORCID

Kirsten Røland Byermoen https://orcid.org/0000-0002-2619-5825
Espen Andreas Brembo https://orcid.org/0000-0002-6738-0445
H. Ösp Egilsdottir https://orcid.org/0000-0003-4453-6491
Lena Günterberg Heyn https://orcid.org/0000-0003-1279-2650

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SUPPORTING INFORMATION

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

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Attachments

1. Cooperation agreement between University of South-Eastern Norway and Drammen municipality
2. Written information to students (studies 1 and 2)
3. Written information to patients (studies 1 and 2)
4. Written information to nurses (study 3)
5. Observation notes (studies 1 and 2)
6. Interview guide (studies 1 and 2)
7. Interview guide (study 3)
8. Decision letter Norwegian Centre for Research Data, NSD (study 1 and 2)
9. Decision letter Norwegian Centre for Research Data, NSD (study 3)

Samarbeidsavtale

mellom Drammen Kommune og Universitetet i Sørøst-Norge (USN)

Dato: 2.oktober 2018

1. Formål og parter

Formålet med denne avtalen er å regulere samarbeidet mellom Drammen Kommune (DK) og Universitetet i Sørøst-Norge (USN) i prosjektet «Klinisk vurderingskompetanse – omsetting av naturvitenskap til sykepleierens praksis». Avtalen gjøres i to originaler, hvor et beholdes av hver part. Dersom det er flere parter utferdiges et tilsvarende antall originaler.

Ved all helsehjelp; behandling, pleie og helseomsorg i norsk helsevesen, har sykepleiere en sentral rolle ved å ha nærmest kontakt med pasienten med tett oppfølging og tilstedeværelse over lengre tid. Med store teknologisk fremskritt innen behandling av sykdom, lever mennesker lengre med mer komplekse helsetilstander. Det krever at sykepleiere har inngående kompetanse for å oppdage problemer på et tidligere stadium, og utøve tydeligere roller i det tverrfaglige samarbeidet rundt hver enkelt pasient.
Kombinasjon av fremskritt innen naturvitenskapelig kunnskap som forandrer behandlingsrepertoar og implementering av samhandlingsreformen har ført til endringer i hvor pasienter skal motta helsehjelp i norsk helsevesen. Pasienter skrives fortere ut fra sykehus, og mer behandling gjennomføres i primærhelsetjenesten. Dette er gjerne mer krevende behandlinger, der flere sammensatte sykdommer og flere som lever med kroniske lidelser bidrar til å endre sykepleieres tradisjonelle rolle og ansvar.
Kravene til kompetanse som sykepleiere trenger for å yte helsehjelp og delta i kliniske beslutningsprosesser øker og mye av grunnlaget hentes fra naturvitenskapelig emner.

På bakgrunn av de utfordringer helsevesenet står overfor, ble Universitetet i Sørøst-Norge (USN) i mars 2018 tildelt forskningsstøtte fra Olav Thon Stiftelsen til prosjektet «Klinisk vurderingskompetanse – omsetting av naturvitenskap til sykepleierens praksis», med fokus på klinisk vurderingskompetanse gjennom implementering av Grunnleggende Systematisk Klinisk Undersøkelse og Vurdering (G-SKUV) ved sykepleierutdanningen på campus Drammen.

Fokus for prosjektet er å utforske innvirkning av læringsmiljø på sykepleierstudenters anvendelse og overføring av kunnskap innen naturvitenskaplige emner til klinisk vurderingskompetanse. Prosjektet er et doktorgradsprosjekt der Kirsten Røland Byermoen er stipendiat og daglig ansvarlig, professor Hilde Eide er hovedveileder og førsteamanuensis Lena Heyn og professor II Anne Moen er biveiledere.

2. Partene og kontaktpersoner

Partene i avtalen er:

I. Universitetet i Sørøst-Norge
   Postboks 235, 3603 Kongsberg
   Org.nr. 911 770 709
   Fakultet for helse- og sosialvitenskap/ Institutt for sykepleie- og helsevitenskap
   Heidi Kapstad/ Hilde Eide/Kirsten Røland Byermoen

II. Drammen Kommune
Postboks 7500, 3008 Drammen
Org.nr. 919642254
Utviklingsenheten Skap gode dager
Utviklingsleder Lisbeth Bakken

Kontaktpersoner:

Institusjon/part	Avdeling	Navn og stilling
Universitetet i Sørøst-Norge	Fakultet for helse- og sosialvitenskap/ Institutt for sykepleie- og helsevitenskap	Kirsten Røland Byermoen, PhD kandidat
Universitetet i Sørøst-Norge	Fakultet for helse- og sosialvitenskap/ Institutt for sykepleie- og helsevitenskap	Hilde Eide, Professor/veileder
Drammen Kommune	Skap Gode Dager	Lisbeth Bakken / Hege Berge

3. Oppgavefordeling

For å legge til rette for praksisveiledere og andre ansatte på praksisstedet vil gode forberedelser være essensielt. Det avtales med hver enkelt leder på Drammen Helsehus og Åssiden hjemmesykepleiedistrikt dagskurs i G-SKUV som ansatte kan delta på. Fokus for kurset vil være en teoretisk innføring i G-SKUV, praktiske øvelser og diskusjoner for hvordan man som veileder kan legge til rette for gode læringssituasjoner og læringsmiljø for sykepleierstudenter.
Som et forarbeid til oppstart av prosjektet tilbys praksisveiledere og annet personale ved aktuelle avdelinger ved Helsehuset og Åssiden hjemmesykepleiedistrikt, tilgang til nettbasert kurs i klinisk vurderingskompetanse (Massive Open Online Course-MOOC) som er utviklet ved UiO – Det Medisinske fakultet i samarbeid med deler av prosjektgruppen fra USN. MOOC er et nettbasert kurs som kan gjennomføres ut i fra egne ønskelige tidspunkt. Hver enkelt deltaker vil få sitt eget brukernavn og passord, gjennom lenke som sendes fra Kirsten Røland Byermoen.

Gjennom faglig forståelse av hva som innebærer å arbeide med G-SKUV og klinisk vurderinger i sin daglige sykepleie, står helsepersonell og kontaktsykepleiere i god posisjon for å legge til rette for studenter til å anvende og øve på G-SKUV, etterspørre og stimulere til faglige refleksjoner omkring hvordan man som sykepleier og student planlegger sin utøvelse av personorienterte sykepleie.

I prosjektet er det ønskelig å følge studenter som er i praksis ved Drammen Helsehus og Åssiden hjemmesykepleiedistrikt over tid, for å kunne utforske hvordan de utvikler sin kliniske vurderingskompetanse gjennom tredje studieår. Metoden «stimulated recall interview»/stimulert refleksjonsintervju (SRI) vil anvendes. Metoden går ut på at sykepleierstudentene som er med i prosjektet blir observert av PhD stipendiaten samt bli tatt opp med lydopptak når studenten er i en pasientsituasjon der fokus er G-SKUV. Etter pasientsituasjonen, vil studenten og PhD stipendiaten- på bakgrunn av observasjonsnotater og lydopptak- gå gjennom studentens

erfaringer og vurderinger over egne handlinger i aktuell situasjonen. Dette vil gjøres en gang i både sykehjempraksis og en gang i hjemmesykepleiepraksis.

Fordi sykepleierstudenter ønsker seg praksisplasser ut i fra egne ønsker, vil det forekomme at studenter har praksis ved andre sykehjem eller distrikt enn Drammen Helsehus og Åssiden hjemmesykepleiedistrikt i. Her er det likevel ønskelig å gjennomføre en seanse med SRI hos disse studenter da det gir rikt datasamlingsgrunnlag når læringsmiljø vedrørende G-SKUV utforskes.

Videre er det viktig å prate med sykepleierstudenter i gruppeintervju om deres erfaringer med hvordan de opplever innflytelse på deres anvendelse og fokus på klinisk vurderingskompetanse. Likeledes vil det være relevant å snakke med sykepleiere og annet helsepersonell om deres rolle i et læringsmiljø.
NSD har godkjent prosjekt, datasamlingsmetode og informasjonsskriv som ligger vedlagt dette dokument. REK har i en fremleggsvurdering konkludert at prosjektet ikke må godkjennes av REK.

Drammen kommune legger til rette for at prosjektet kan gjennomføres i samarbeid med USN.

4. Samarbeidets budsjett, fakturering og regnskap

Partene dekker sine respektive utgifter i prosjektet.

5. Samarbeidets varighet

Prosjektsamarbeidet skal vare i inntil utgangen av 2020. Eventuelle forlengelser eller avslutning skal behandles etter bestemmelsene i denne avtalen og alminnelige avtalerettslige regler.

6. Immaterielle rettigheter og bruk av data og resultater

Hver part får eierskap og rettigheter til de resultatene som er frembrakt av egne ansatte, om ikke annet er avtalt. Hver part har så lenge samarbeidet varer, rett til vederlagsfri ikke-eksklusiv bruk av andre parters resultater når slik bruk er nødvendig for å gjennomføre forpliktelsene i henhold til avtalen.
Eierskap til resultater frembrakt i fellesskap skal være felles eiendom, og kan utnyttes av begge parter. Videreutnyttelse reguleres i en separat avtale, dersom en av partene ønsker en annen fordeling av bruksrett.

7. Endringer i avtalen

Denne avtalen kan bare endres ved enighet mellom partene. Ønske om endring fremsettes skriftlig for alle avtaleparter. Avtalte endringer legges som vedlegg til denne avtalen.

8. Oppsigelse og heving av avtalen

Ønske om oppsigelse fremsettes skriftlig til alle avtaleparter.
Dersom det foreligger vesentlig mislighold kan partene, etter å ha gitt skriftlig varsel og rimelig frist til å bringe forholdet i orden, heve avtalen med umiddelbar virkning.

9. Force majeure

Skulle det inntreffe en ekstraordinær situasjon som ligger utenfor partenes kontroll som gjør det umulig å oppfylle plikter etter denne avtalen, skal motparten varsles om dette så raskt som mulig. Den rammede parts forpliktelser suspenderes så lenge den ekstraordinære situasjonen varer. Den annen parts motytelse suspenderes i samme tidsrom.

10. Erstatning

Samlet erstatning i avtaleperioden er begrenset til avtalepartens dokumenterbare direkte tap. Erstatning for indirekte tap kan ikke kreves. Tap av data anses som indirekte tap.
Disse begrensningene gjelder ikke hvis en av partene eller noen denne svarer for, har utvist grov uaktsomhet eller forsett.

11. Tvister og verneting

Partenes rettigheter og plikter etter denne avtalen bestemmes i sin helhet av norsk rett. Dersom det oppstår tvist mellom partene om tolkningen eller rettsvirkningene av avtalen, skal tvisten først søkes løst gjennom forhandlinger.
Dersom en tvist i tilknytning til denne avtalen ikke blir løst etter forhandlinger, kan partene forsøke å løse tvisten ved mekling. Partene kan velge å legge Den Norske Advokatforenings regler for mekling ved advokat til grunn, eventuelt modifisert slik partene ønsker. Det forutsettes at partene blir enige om en mekler med den kompetansen partene mener passer best i forhold til tvisten. Den nærmere fremgangsmåten for mekling bestemmes av mekleren, i samråd med partene.
Dersom en tvist ikke blir løst ved forhandlinger eller mekling, kan hver av partene forlange tvisten avgjort med endelig virkning ved norske domstoler. Avtalens verneting er Oslo tingrett.

12. Avtaledokumenter/tillegg til avtalen

Følgende dokumenter skal regnes som vedlegg til avtalen:

- Prosjektplan fra søknad til Thon-stiftelsen.
- Prosjektplan Kirsten Røland Byermoens doktorgradsprosjekt
- Informasjonsskriv til pasienter, ansatte og sykepleierstudenter

13. Signatur

For **Universitetet i Sørøst-Norge**	For **Drammen Kommune**
Sted og dato: Drammen 2/10-18	*Sted og dato:*
Heidi Kapstad, Dekan, Fakultet for helse og sosialvitenskap	Lisbeth Bakken, Utviklingsleder i Helse-, sosial og omsorg

Avtalen undertegnes i to eksemplarer, ett til hver part.

Vil du delta i forskningsprosjektet

«Implementering av systematisk kliniske vurderinger i sykepleierstudenters kliniske praksis»?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å utforske sykepleierstudenters utvikling av klinisk vurderingskompetanse. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Forskningsprosjektet er en doktorgradsstudie innen Grunnleggende Systematisk Undersøkelse og Vurdering G-SKUV), som ble implementert i bachelorutdanningen i sykepleie ved Universitetet i Sørøst Norge (USN) i 2015. Siden undervisningsopplegget fortsatt er nytt i klinisk praksis, ønsker vi utforske hvordan læringsmiljø har innflytelse på anvendelse og utvikling av klinisk undersøkelse og vurdering. Derfor inviteres studenter som studerer sykepleie, campus Drammen ved USN å delta i evalueringen av G-SKUV

Hvem er ansvarlig for forskningsprosjektet?
Prosjektet er et samarbeidsprosjekt mellom Universitetet i Sørøst-Norge og Drammen Kommune.

Hvorfor får du spørsmål om å delta?
Ved at du har ønsket deg til praksis på Drammen Helsehus, har du allerede fått informasjon om at prosjektet vil gjennomføres der. Siden undervisningsopplegget fortsatt er nytt i klinisk praksis, ønsker vi utforske hvordan læringsmiljø har innflytelse på anvendelse og utvikling av klinisk undersøkelse og vurdering. Derfor inviteres studenter som studerer sykepleie, campus Drammen ved USN å delta i evalueringen av G-SKUV.

Hva innebærer prosjektet for deg?
Med ditt samtykke til å delta på prosjektet, vil jeg være tilstede på din praksisplass enkelte dager for å observere læringssituasjoner i en pasientsituasjon som tas opp på lydbånd og jeg er tilstede som observatør. Kort tid etter situasjonen er gjennomført, skal vi to sammen høre på lydopptaket fra pasientsituasjonen. Lydopptaket og mine observasjoner vil danne grunnlag for dine refleksjoner omkring dine handlinger og vurderinger for vår samtale. Denne prosessen vil utføres i både sykehjemspraksis og hjemmesykepleiepraksis. På den måten kan du se på

pasientsituasjonen og samtalen i etterkant som en læringssituasjon og grunnlag for egen utvikling.

Mot slutten av praksisperioden vil studenter som har praksis på Helsehuset inviteres til gruppeintervju der fokus vil være hvordan du som student opplever å arbeide med G-SKUV og hva læringsmiljø betyr for deg.

Intervjuene vil finne sted i arbeidstiden og vil ta om lag 1 time. Intervjuene vil bli tatt opp på lydbånd, men vil slettes etter transkribering.

Det å ha noen som observerer det en gjør i sitt arbeid kan oppleves litt ubehagelig. Jeg er imidlertid ikke er til stede for å bedømme den jobben du gjør, men for at jeg selv skal lære å forske gjennom å observere og intervjue. Jeg håper at forskningsprosjektet kan bidra til å sette søkelys på hva som gir gode læresituasjoner for sykepleierstudenter.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Jeg vil overholde taushetsplikten og sensitive opplysninger vil ikke fremkomme i prosjektresultatet.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Prosjektet skal etter planen avsluttes 1/6-2021.

Jeg vil overholde taushetsplikten og sensitive opplysninger vil ikke fremkomme i prosjektresultatet. Notatene skal oppbevares i låsbart skap og vil kun være tilgjengelig for meg og min veileder. Det samme gjelder lydbåndopptak, der lydfilen med deg skal slettes etter at vi har snakket sammen. Når prosjektet er avsluttet og godkjent vil alle notatene samt lydbånd slettes. Personopplysninger blir anonymisert og jeg kommer heller ikke til å navngi hvilket sykehjem, hjemmesykepleie distrikt jeg har foretatt observasjoner i. All informasjon skal kun brukes slik som beskrevet i hensikten med prosjektet.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:
- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Universitetet i Sørøst-Norge har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Universitetet i Sørøst-Norge ved Kirsten Røland Byermoen på telefon 99506549 eller mail kirsten.roland.byermoen@usn.no.
- Vårt personvernombud: Paal Are Solberg ved Universitetet i Sørøst-Norge
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Kirsten Røland Byermoen	Hilde Eide
PhD-stipendiat	Veileder

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet (sett inn tittel), og har fått anledning til å stille spørsmål. Jeg samtykker til:

- ☐ å delta på lydbåndopptak og reflektere omkring den etterpå
- ☐ å delta på gruppeintervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. 2021.

(Signert av prosjektdeltaker, dato)

Vil du delta i forskningsprosjektet

«Implementering av systematisk kliniske vurderinger i sykepleierstudenters kliniske praksis»?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å utforske sykepleierstudenters utvikling av klinisk vurderingskompetanse. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Forskningsprosjektet er en doktorgradsstudium innen Grunnleggende Systematisk Undersøkelse og Vurdering G-SKUV), som ble implementert i bachelorutdanningen i sykepleie ved Universitetet i Sørøst Norge (USN) i 2015. Siden undervisningsopplegget fortsatt er nytt i klinisk praksis, ønsker vi utforske hvordan læringsmiljø har innflytelse på anvendelse og utvikling av klinisk undersøkelse og vurdering.

Hvem er ansvarlig for forskningsprosjektet?
Prosjektet er et samarbeidsprosjekt mellom Universitetet i Sørøst-Norge og Drammen Kommune.

Hvorfor får du spørsmål om å delta?
Store deler av sykepleierstudenters utdanningsløp foregår i praksis. Med prosjektets formål er å utforske sykepleierstudenters utvikling av klinisk vurderingskompetanse, ønsker vi å møte pasienter som tar imot helsehjelp gjennom kommunehelsetjenesten, som lar seg bli undersøkt av sykepleierstudenter.

Hva innebærer prosjektet for deg?
På ulike tider av året, har sykepleierstudenter fra USN praksis ved sykehjem eller hjemmesykepleien. Studenter har blitt invitert til å være med på prosjektet, for å utforske hvordan kliniske vurderinger utvikles gjennom praksis. For å danne et bilde av sykepleierstudenters utvikling av klinisk undersøkelser, ønsker vi å ta opp på lydbånd en situasjon når sykepleierstudenten er hos deg når en klinisk undersøkelse gjennomføres. Det vil være en forsker tilstede for å observere sykepleierstudentens handlinger.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg. Det vil heller ikke påvirke den helsehjelp som du mottar fra kommunehelsetjenesten.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

Lydbåndopptak og notater vil håndteres av sykepleierstudent og forsker som har taushetsplikt. Kort tid etter besøket fra sykepleierstudenten, vil studenten møte en forskeren som har observert situasjonen. Under samtalen vil studenten og forskeren lytte til lydopptaket i enerom. Fokus på samtalen vil være at studenten reflekterer omkring sine egne handlinger og vurderinger. Samtalen mellom forsker og student vil tas opp på lydbånd, og ingen personidentifiserbar informasjon om deg vil synliggjøres under samtalen. Lydfilen av deg vil lagres på Universitetets sikre datalagringsplass, der kun forskergruppen har tilgang med passord. Lydfilen av samtalen mellom forsker og sykepleierstudent vil skrive om til tekst, og deretter slettes.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Prosjektet skal etter planen avsluttes 1/6-2021.

Sykepleierstudent og forsker vil overholde taushetsplikten, sensitive opplysninger vil ikke fremkomme i prosjektresultatet. Observasjonsnotatene skal oppbevares i låsbart skap og vil kun være tilgjengelig for prosjektgruppen. Det samme gjelder lydbåndopptak. Når prosjektet er avsluttet og godkjent vil alle notatene samt lydbånd slettes. Personopplysninger blir anonymisert og jeg kommer heller ikke til å navngi hvilket sykehjem og hvilken kommune jeg har foretatt observasjoner i. All informasjon skal kun brukes slik som beskrevet i hensikten med prosjektet.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:
- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Universitetet i Sørøst-Norge har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Universitetet i Sørøst-Norge ved Kirsten Røland Byermoen på telefon 99506549 eller mail kirsten.roland.byermoen@usn.no.
- Vårt personvernombud: Paal Are Solberg ved Universitetet i Sørøst-Norge
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Kirsten Røland Byermoen — Hilde Eide

PhD-stipendiat — Veileder

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet (sett inn tittel), og har fått anledning til å stille spørsmål. Jeg samtykker til:

- ☐ å delta på lydbåndopptak
- ☐ at sykepleierstudenten omtaler opptaket i påfølgende intervju med forsker

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. 2021.

(Signert av prosjektdeltaker, dato)

Universitetet i Sørøst-Norge

Vil du delta i forskningsprosjektet

«Utvikling av klinisk vurderingskompetanse fra student til selvstendig sykepleier»?

Formål
Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å utforske utvikling av klinisk kompetanse fra student til selvstendig sykepleieutøvelse. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Hvem er ansvarlig for forskningsprosjektet?
Universitetet i Sørøst-Norge gjennomfører dette prosjektet.

Hvorfor får du spørsmål om å delta?
Ved at du deltok på prosjektet «Implementering av systematisk kliniske vurderinger i sykepleierstudenters kliniske praksis» i 2018-2019 i ditt siste studieår på sykepleieutdanningen, inviteres du til en oppfølgingsstudie.

Vi utforske hvordan læringsmiljø har innflytelse på bruk og utvikling av klinisk kompetanse over et lengre tidsperspektiv.

Hva innebærer prosjektet for deg?
Med ditt samtykke til å delta på prosjektet, vil jeg ta gjennomføre et individuelt intervju med deg, enten på telefon eller zoom. Intervjuet vil inneholde spørsmål som ønsker å utforske hvordan du erfarer egen kliniske kompetanse etter endt utdanning. Lydopptaket vil danne grunnlag for dine refleksjoner omkring dine erfaringer som ferdigutdannet sykepleier.

Intervjuet vil finne sted en dag og tidspunkt som passer deg vil ta om lag 1 time. Intervjuene vil bli tatt opp på lydbånd, men vil slettes etter transkribering.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Jeg vil overholde taushetsplikten og sensitive opplysninger vil ikke fremkomme i prosjektresultatet.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Prosjektet skal etter planen avsluttes 1/6-2022.

Jeg vil overholde taushetsplikten og sensitive opplysninger vil ikke fremkomme i prosjektresultatet. Notatene skal oppbevares i låsbart skap og vil kun være tilgjengelig for meg og min veileder. Det samme gjelder lydbåndopptak, der lydfilen med deg skal slettes etter at vi har snakket sammen. Når prosjektet er avsluttet og godkjent vil alle notatene samt lydbånd slettes. Personopplysninger blir anonymisert og jeg kommer heller ikke til å navngi hvilket sykehjem, hjemmesykepleie distrikt jeg har foretatt observasjoner i. All informasjon skal kun brukes slik som beskrevet i hensikten med prosjektet.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Universitetet i Sørøst-Norge har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?
Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Universitetet i Sørøst-Norge ved Kirsten Røland Byermoen på telefon 99506549 eller mail kirsten.roland.byermoen@usn.no.
- Vårt personvernombud: Paal Are Solberg ved Universitetet i Sørøst-Norge
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Kirsten Røland Byermoen PhD-stipendiat

Hilde Eide Veileder

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet (sett inn tittel), og har fått anledning til å stille spørsmål. Jeg samtykker til:

- ☐ å delta på lydopptak gjennom et intervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. juni 2022.

(Signert av prosjektdeltaker, dato)

Studentnr:
Tid:
Sted:

Pasient: kvinne/mann
Diagnose(r):
Alder:
Tiltak/innleggelsesårsak:

Observasjonsfokus: • G-SKUV • Inspeksjon, palpasjon, perkusjon, auskultasjon	utfører	uklart	Utfører ikke	Kommentar
Perifer sirkulasjon				
Inspeksjon av alle ekstremiteter (farge, hårvekst, utslett, sår, ødemer)				
Vurdere og telle puls på ulike steder på kroppen (for eks. carotis, radialis, dorsal pedis)				
Vurdere ødemer				
Vurdere kapillærfylling				
Vurdere stående hudfold				
Vurdere smerter				
Vurdere sensibilitet				
Vurdere finmotorikk				
Ta blodtrykk (med stetoskop)				
Lytte etter hjertelyder S1 og S2				
Lytte på carotis puls				
Lunger				
Inspeksjon (bevegelser, frekvens, dybde, kvalitet, dyspne, hoste, ekspektorat)				
Inspeksjon av hud (generell farge, cyanose, utslett, sår)				
Palpasjon av brystkasse (bevegelse, temperatur, klumper, smerter/ømhet)				
Perkusjon av lunger (valgfritt) – sammenligne venstre og høyre side				

Auskultasjon av lunger og sammenligne venstre og høyre side				
Vurdere oksygenmetning				
Abdomen				
Inspeksjon av buken i forhold til ulike faktorer som for eksempel arr, skader, spent buk og bulende strukturer				
Auskultasjon på ulike steder på buken og lytt etter alle type lyder				
Lett og dyp palpasjon på fire deler av buken (tykktarmen, leverbuen, aorta, evt. milten og urinblære)				
Perkusjon av lever, tykktarm og urinblære				
Bankømhet over nyrer (bak på ryggen)				
Nevrologi				
Mental status Våken (orientert/ikke orientert for tid og sted) Redusert bevissthet (GCS) MMSE Klokketesten Confusion Assessment method (CAM/Delir)				
Hjernenerver **II:** Test av synsfelt (sidesyn – starte med hendene bak ørene og flytte fremover) **II:** Pupille respons **III, IV og VI:** Test av øynenes muskulatur (blikk følger pekefinger i en stjerne, uten å bevege på hodet) **VIII:** Test av hørsel (hvisketesten og fingergnisse-test)				

V: Test av sensibilitet i ansikt (berøre panne, kinn og underkjeve – pas. øyne er lukket) og test av muskulatur i ansikt (palpere tyggemuskulatur) **VII:** Test av ansiktsbevegelser (rynke pannen/knipe sammen øyne/blåse opp kinn/smile) **IX:** Test av svelgfunksjon (gi pas vann å drikke) **XII:** Tungens bevegelser (pas strekker ut tungen)				
Motorikk (symmetri?) Muskelatrofi Muskeltonus: Bevegelse av led, pas slapper av Muskelstyrke: -Over ekstremiteter: Skulderløft, håndtrykk, fleksjon og ekstensjon av underarmer med motstand. Under ekstremiteter: Løfte begge kne med motstand, reise seg opp fra sittende stilling med/uten bruk av armer, sette seg ned igjen (kan gjøres samtidig med «gå-testen».				
Sensibilitet perifert (symmetri?) -Leddsans: Bevegelse av storetå opp/ned, pas har øynene lukket -Sensibilitet i hud under føttene: Bruk av monofilament, pas har øynene lukket				
Koordinasjon og balanse (symmetri?) -Pekefinger/nesetipp-prøven: Med åpne/lukkede øyne (uten intensjonstremor) -Raske alternerende håndbevegelser - Hæl/kne prøven: pas ligger på rygg med lukkede øyne, hælen finner kne på motsatt fot og fører foten ned etter leggen (gjøres på begge sider)				

- Rombergs-testen: Balansetest med lukkede øyne -Gå-test: vurdere ustøhet og selve gangmønstret og at pasienten klarer å snu uten problemer				
Reflekser (symmetri?) -Patellarefleksen: Reflekshammer mot leddbånd på forsiden av kneet (kan gjøres før/etter "hæl-kne-prøven) -Plantarrefleksen: Stryk en (ikke for skarp) gjenstand bestemt langs fotsålen, over tåballen og avsluttes under stortå (gjøres før/etter test med monofilament). Stortåen skal normalt flekteres (bøyes nedover) eller ikke rører seg.				

Intervjuguide sykepleierstudenter:

Semistrukturert intervjuguide med spørsmål som peker tilbake på den faktiske hendelsen.

A: Sykepleierstudents oppfatning i bruk av G-SKUV undersøkelsesteknikker i den kliniske situasjonen	- Hva var hensikten med det du gjorde? / Faglig begrunnelse? - Hvilket mål hadde du for handlingen? - Hvilke forventninger hadde du til dine funn? - Hvordan kom du fram til akkurat denne måten å gjøre undersøkelsen på? Med disse teknikker?
B: Faktorer som påvirker sykepleierstudentens bruk av G-SKUV undersøkelsesteknikker	- Kan du si noe om dine ansvarsområder for å bruke G-SKUV /ditt ansvar knyttet til denne situasjonen? Sett opp imot behandling? overbehandling? Å observere behandlingen? - Kan du beskrive evt. utfordringer du møtte på i den aktuelle situasjonen? - Hva tenker du er viktig i situasjoner som dette? (Etikk, verdier, kunnskap)
C: Hvordan sykepleierstudenter beskrev sine kliniske beslutninger for de anvende G-SKUV- undersøkelses teknikker som ble brukt	– Kan du forklare hva du tenkte i denne situasjonen? Hvem er pasienten/ hvilke diagnoser/ hva er viktig å utføre her? - Kan du beskrive hvilke overveielser og vurderinger du gjorde av dine funn? - Hvordan bruker du kunnskapen din i situasjoner som dette?
D: Ved intervju nummer to	– Vi har vært gjennom slike stimulerte intervju ved to anledninger. – Hvordan tenker du omkring denne situasjonen? Hvordan tenker du omkring din evne til å artikulere/sette ord på kunnskapen din? Blir det mer presist?

Tematisk intervjuguide til del-studie 3

Deltaker ID:

Årstall født:

Kjønn:

Arbeidssted:

Stillingsprosent:

Først og fremst vil jeg takk for at du vil bli med på dette oppfølgings intervjuet med meg. Etter de to intervjuene jeg hadde med deg og de andre deltakerne i 2018-2019, fikk vi veldig spennende funn om hvor komplekst det er for studenter å utvikle klinisk kompetanse underveis i utdanningen, og at det er mange faktorer som påvirker læringsprosessen. Vi lurer på betydningen av og mulighetene for at studenter setter ord på sin kunnskap, reflektere og diskutere med andre, og hvilken betydning det har for videre utvikling av klinisk kompetanse. Og med utvikling av denne kliniske kompetansen gir en trygghet i å tilpasse sine vurderinger til hver enkelt pasientsituasjon.

Det er nå snart to år siden du var uteksaminert fra sykepleierutdanningen. Nå etter snart 2 år, ønsker jeg å få dine tanker og erfaringer med videreutvikling av din kliniske kompetanse i tiden fra studenttilværelse til utdannet sykepleier.

Tema	**Spørsmål**
A: Arbeidsmiljø	Som en start tenkte jeg at vi kan gå litt inn på hvordan det går for tiden. Hvordan har du det på jobben? 1. Hvordan opplever du arbeidsmiljøet på din jobb? - Hva er et godt arbeidsmiljø for deg? - Støttende læringsfelleskap - Møter du også kollegaer du synes er vanskelig å samarbeide med? Hva er vanskelig? Hvem er vanskelige? - Samarbeid - Leders rolle - Kolleger - Tverrfaglig samarbeid/leger- diskusjon omkring pasienter/hypoteser - Rolleavklaringer? - Er det noe som hemmer et godt praksisfellesskap? - Hva har vært avgjørende for deg? På hvilken måte? **Vær obs på vendepunkter og nøkkelord!**
B: Pasientbehandling	2. Fortell litt om hva om som er viktig for deg som sykepleier. Hva håper du å få til? - Hvordan griper du det an, hvordan liker du å gå frem? - Hva er utgangspunktet ditt når du møter pasienter. Hva vurderer du pasienten ut ifra? - Utgangspunkt i pasientens behov, Sjekklister, News, head to toe, symptombasert, teknologisk monitorering eller ingen? - Relasjonell kompetanse - Tidligere relasjon med pasienten/nytt møte med pasienten? 3.Hva er et godt møte med en pasient for deg? - Hvilken rolle har pårørende - Hva er krevende? Vanskelige pasienter/hvordan blir det for deg? **Vendepunkter!**

C: Kliniske vurderinger	4. Hvis du tenker tilbake på en konkret pasientsituasjon i møte med pasienter, som har vært viktig for deg som spl. Kan du fortelle om den? - hvem var der? - hva skjedde? - hvordan opplevde du det? - Gikk det fint, eller ikke? - Hva har vært viktig for deg ved den situasjonen i ettertid? - Har det ført til noen endringer, at du gjør noe annerledes? 5. Kan du beskrive hvordan du erfarer din kliniske kompetanse nå? 6. Kan du si noe om hvordan ferdighetene dine i kliniske undersøkelser har utviklet seg fra treningen startet? - Har det vært avgjørende situasjoner for hva som har formet ditt syn på egen kompetanse? Hvordan erfarte du det/reagerte du? - hva fremmer - hva hemmer - hva kunne du ha trengt når du ble uteksaminert? - hva trenger du nå? - Hvordan ser du på læring? Oppsøker du læring selv, går inn for å være lærende vesen, trenger du andre for å lære? Er det ved ferdigutdanning læring din begynte? - Korrigert/forbedret ferdigheter? 6. Følge opp det de sa under intervjuene, som studenter : **se på hver enkelt intervju i forkant.** - **Vendepunkter!**

Avsluttende: Er det noe mer du gjerne vil fortelle om før vi avslutter?

Sikt

Vurdering av behandling av personopplysninger

Referansenummer
196758

Vurderingstype
Standard

Dato
17.09.2018

Prosjekttittel
Implementing use of physical assessment skills in clinical rotation to enhance clinical competence and patient safety in nursing education

Behandlingsansvarlig institusjon
Universitetet i Sørøst-Norge / Fakultet for helse- og sosialvitenskap / Institutt for sykepleie- og helsevitenskap

Prosjektansvarlig
Kirsten Røland Byermoen

Prosjektperiode
01.09.2018 - 01.06.2020

Kategorier personopplysninger
Alminnelige
Særlige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 01.06.2020.

Meldeskjema

Kommentar
Det er vår vurdering at behandlingen vil være i samsvar med personvernlovgivningen, så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet den 17.09.2018 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

MELD ENDRINGER
Dersom behandlingen av personopplysninger endrer seg, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. På våre nettsider informerer vi om hvilke endringer som må meldes. Vent på svar før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle særlige kategorier av personopplysninger frem til 01.06.2020.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 nr. 11 og art. 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse, som kan dokumenteres, og som den registrerte kan trekke tilbake.

Lovlig grunnlag for behandlingen vil dermed være den registrertes uttrykkelige samtykke, jf. personvernforordningen art. 6 nr. 1 a), jf. art. 9 nr. 2 bokstav a, jf. personopplysningsloven § 10, jf. § 9 (2).

PERSONVERNPRINSIPPER
NSD finner at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen:
- om lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
De registrerte vil ha følgende rettigheter i prosjektet: åpenhet (art. 12), informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19) og dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13. Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32)

NSD legger til grunn at behandlingen oppfyller kravene til behandling av personopplysninger utenfor EU (personvernforordningen kapittel 5). For å forsikre dere om at kravene oppfylles, må prosjektansvarlig følge interne retningslinjer/rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Kontaktperson hos NSD: Belinda Gloppen Helle
Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Sikt

Vurdering av behandling av personopplysninger

Referansenummer
302694

Vurderingstype
Standard

Dato
05.01.2021

Prosjekttittel
Development towards clinical competence in nursing

Behandlingsansvarlig institusjon
Universitetet i Sørøst-Norge / Fakultet for helse- og sosialvitenskap / Institutt for sykepleie- og helsevitenskap

Prosjektansvarlig
Kirsten Røland Byermoen

Prosjektperiode
01.01.2021 - 31.12.2021

Kategorier personopplysninger
Alminnelige

Lovlig grunnlag
Samtykke (Personvernforordningen art. 6 nr. 1 bokstav a)

Behandlingen av personopplysningene er lovlig så fremt den gjennomføres som oppgitt i meldeskjemaet. Det lovlige grunnlaget gjelder til 31.12.2021.

Meldeskjema

Kommentar
Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen, så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjema med vedlegg 5.1.2020. Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER
Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: https://nsd.no/personvernombud/meld_prosjekt/meld_endringer.html

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 31.12.2021.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres og som den registrerte kan trekke tilbake.

Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER
NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:
- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: informasjon (art. 13), innsyn (art. 15), retting (art.

16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og eventuelt rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Kontaktperson hos NSD: Lasse Raa
Tlf. personverntjenester: 55 58 21 17 (tast 1)

Fit for practice
Kirsten Røland Byermoen

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