

Interprofessional teamwork training for nursing and medical students in Norway

Ingunn Aase

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Department of Health Studies

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University of Stavanger
N-4036 Stavanger
NORWAY

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Stavanger, April 2016

Ingunn Aase

Summary

Background: This thesis focuses on interprofessional teamwork (IPT) training for medical and nursing students in Norway, seeking to expand and deepen the knowledge base underpinning such training. The topic raises a number of issues linked to the current status of IPT and IPT training, the conceptual understanding of the perspectives needed for planning and design of IPT training, and the strategies and measures conducive to future improvements. The results discussed in this thesis are published in four separate papers, referred to as papers I-IV.

The expectation that IPT can help reduce patient harm may be regarded the main driver of IPT training in health education and healthcare practice. Policywise, the World Health Organization has highlighted IPT as a core component of the recommended skill-set of healthcare workers. Reiterating this position, Norwegian government authorities have enacted policies calling for collaboration across professions and educational programs, including interprofessional clinical training. To date few studies have explored students', faculty members', and clinical practitioners' conceptualization of IPT training, especially not across diverse stakeholder groups. Students' views are arguably of special interest; in spite of this little attention has been devoted to their perspectives on IPT and IPT training.

Aims: The overarching aim of the thesis is to present in-depth accounts of the stakeholders' perceptions, experiences and recommendations for IPT training in healthcare education in Norway, with the intention of strengthening the knowledge base for the planning, designing and implementation of such training. Against this backdrop the following objectives have guided the research:

- To explore the status of IPT training in the context of the Norwegian education of medical and nursing students.
- To develop a conceptual understanding of IPT training in healthcare, based on the perspectives of the stakeholders.

- To develop and conduct a pilot IPT training session for nursing and medical students.

More specifically, seven research questions were crafted to operationalize the objectives.

Methodology: This thesis is qualitative in nature, employing an explorative and descriptive case study design. The case is set in the Norwegian educational system for nursing and medical students, and encompasses two universities and a university hospital. The case content focuses on the perspectives of stakeholders (students, teachers, and clinicians). The case is explorative due to several novel aspects, including bringing together the views of students, teachers, and clinicians for a qualitative inquiry of perspectives, ideas, and practices pertaining to IPT and IPT training in a pre-graduate educational setting.

Paper I queried all 32 of Norway's nursing and medical educational institutions for information on IPT training offered through study programs. Data in papers II and III were acquired mainly through focus group interviews; paper IV is based on data obtained from debrief sessions that followed simulation-based IPT training sessions. In addition, the study included data from individual interviews and observations carried out at a hospital ward (paper III). The data analysis was mainly inductive, based on content analysis, a technique that generates categories and themes that are grounded in the data. The data analysis resulted in the development of a conceptual framework for IPT training.

Results: The four papers together constitute a cohesive effort to expand and deepen the knowledge underpinning IPT training for medical and nursing students in Norway. Grounded in the perspectives of the key stakeholders, the results are concerned with fundamental principles. Below, the main results are structured according to the seven research questions:

What are the commonalities and differences in the IPT contents adopted in the curricula of the various educational institutions? (paper I). Encouraged by government policies, all of the medical and nursing schools in Norway had adopted objectives of providing IPT training. The curricula of these schools

were similarly structured with two components: theoretical lecturing and clinical practice.

How are the components of IPT embedded in nursing and medical curricula in Norway? (paper I). Most of the schools – medical and nursing – had introduced IPT as a topic in theoretical lecturing; only three nursing schools had yet to do so. In clinical practice, the uptake of IPT training was slower; one of four medical schools, and 25 of 28 nursing schools did not offer IPT training.

What are students' perceptions of their professional roles in the context of IPT? (paper II). A knowledge gap was found to exist between the medical students and the nursing students; meaning the medical students had incomplete knowledge of the capabilities of the nursing students, and vice versa. The knowledge gap was perceived as an obstacle to IPT. The analysis further exposed a traditional pattern of professional roles prevailing in IPT, influencing the professional understanding of responsibility. The medical students were inclined to individual behavior, assuming responsibility, while the nursing students perceived themselves as coordinators inclined to sharing responsibility.

How do students perceive IPT arenas? (paper II). There was substantial variation in the students' perceptions of IPT arenas (e.g. ward rounds, psychiatric wards), reaching from arenas with good collaboration, to arenas characterized by rigid hierarchical structures. Psychiatric wards were highlighted as arenas favorable to collaboration and IPT. The students suggested the huddle meetings and the daily rounds as useful arenas to serve as a basis for IPT training.

How do the relevant stakeholder groups perceive the contents of IPT in the education of nursing and medical students? (paper III). Students and other stakeholders perceived IPT and IPT training favorably but still profoundly influenced by professional role patterns, with the medical students and physicians occupying the dominant role. The perceptions of IPT and IPT training among the stakeholders exposed three perspectives through which issues pertaining to IPT training were addressed: clinical professionalism, team performance, and patient-centered perspective. Together the perspectives

constitute a conceptual framework that provides a structure for addressing a broad range of phenomena associated with IPT and IPT training. The results furthermore concluded that the patient-centered perspective was conspicuously under-represented among the stakeholders.

What characterizes interprofessional communication among nursing and medical students in a simulation-based training session and how do students describe it? (paper IV). Based on the perspectives of the students, the analysis identified two characteristic communication types: clinical exchange and collaborative exchange. Less manifest in the students' communication was patient-centered exchange. Medical students were perceived as likely to favor clinical exchange, and consequently de-emphasizing the need for collaborative and patient centered exchange.

How do nursing and medical students perceive the use of SBAR in a simulation-based training session? (paper IV) Functioning best for clinical exchange, the introduction of SBAR proved only partly successful and required customization to the simulation scenarios at hand.

Conclusion: IPT training as part of clinical practice for nursing and medical students is still being introduced into the Norwegian educational system. Based on stakeholders' perspectives, this thesis has contributed to expanding and deepening the knowledge base underpinning IPT and IPT training. The students' perceptions were of particular interest, and revealed the existence of a mutual knowledge gap among nursing and medical students. A conceptual framework consisting of three dimensions: clinical professionalism, team performance, and patient-centered perspective has been developed, and may serve as a tool for planning and designing IPT training. A pilot IPT session provided insight into communication processes and reiterated the need for the patient-centered perspective.

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Part 1

1 Introduction

This thesis focuses on interprofessional teamwork (IPT) training for medical and nursing students, with the ambition of improving the knowledge base for planning, designing, and implementing such training. The topic introduces a number of themes linked to the status of IPT in healthcare educations, the perspectives of the different members involved in such education (students, teachers, clinicians), and measures conducive to optimizing IPT training in healthcare education.

1.1 Background

The thesis approaches these issues through a case study that centers on the Norwegian educational setting for medical and nursing students. Current study programs have been investigated along with students' and professionals' perspectives and training needs, and a simulation-based IPT training session has been conducted as a pilot.

1.1.1 Teamwork

There is a vast literature devoted to teams and teamwork. This PhD thesis focuses on IPT, a multifaceted concept that several authors (e.g. Barr et al., 2005; Baker et al., 2008; Salas et al., 2008, Reeves et al., 2010b; Thistlethwaite, 2012) have examined. As a minimum, an interprofessional team is a team that engages multiple professionals with complementary competence to work interactively towards a common goal. A more detailed discussion of IPT will be offered in chapter 2.1.

In general, teamwork is seen by many as highly desirable in healthcare organization. The reasons for this are diverse, but a common feature seems to be better quality of patient care and reduction of adverse events (e.g. The Institute of Medicine (IOM), 2003; Manser, 2009; Reeves et al. 2010b; Zwarenstein & Reeves, 2006; Zwarenstein, Goldman & Reeves 2009, Jeffs et al., 2013; Reeves et al., 2013). Manser's (2009) literature review suggests that teamwork is of critical importance in ensuring patient safety, identifying several aspects of teamwork that appear important in that respect, including the

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quality of team collaboration, the shared mental models, coordination, communication, and leadership.

1.1.2 Macro-political context

World Health Organization (WHO, 2010; 2011) has highlighted IPT as a core component in the recommended skill-set of healthcare workers, a view that resonates with research findings (e.g. Clark, 2011; Reeves et al., 2010b). The WHO (2011) *Patient Safety Curriculum Guide – Multiprofessional Edition* recommends educational programs to equip healthcare students with the skills and competence needed to become effective team players. This requires curricula addressing IPT in healthcare, including issues like how teams may improve patient care, how teams form and become effective, team leadership, and communication techniques. The WHO (2010) *Framework for Action on Interprofessional Education and Collaborative practice*, also calls for strengthening the IPT in educational programs.

In Norway, the authorities have been supportive of IPT mandating interprofessional collaboration in healthcare by law: *“if the patient’s need call for it, the professional conduct shall take place based on collaboration and interaction with other professionals”* (Health Personnel Act, 1999, p.4). In 2011, a White Paper report (St. M. 13, 2011-2012) was issued regarding the future of health and social care educations. The report explicitly requires students to learn across educational programs, necessitating professionals and faculty staff to collaborate to ensure educational quality. It also states that interprofessional collaborative learning should be integrated as part of clinical practice (St. M. 13, 2011-2012). Furthermore, IPT in education is emphasized by the Norwegian government in order to ensure quality and safety in healthcare. Collaboration across educational programs and professions is an important driver in preparing the students for the interprofessional collaboration that are currently part of clinical work (St.M. 10, 2012-2013). In sum, the political and legal framework in Norway therefore lends significant support to policies promoting IPT.

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1.1.3 Interprofessionalism in healthcare education

The emerging paradigm of interprofessionalism in healthcare has been entwined with a growing interest in interprofessional education (IPE). Referring to Freeth et al. (2005), Thistlethwaite (2012) suggested defining IPE simply as *Occasions when two or more professions learn from, with and about each other to improve collaboration and the quality of care.*

The definition is arguably somewhat misleading, since it fails to account for the educational setting. For the sake of this thesis, I have added the requirement that the *learning needs to happen as a part of a planned educational effort.* This is in tune with the manner Thistlethwaite (2012) uses the term IPE, e.g. distinguishing between learning resulting from IPE and interprofessional learning happening spontaneously.

In the context of this thesis, it is important to point out that IPE embraces theoretical and methodological issues as well as interprofessional clinical training, the latter being a crucial component of both medical and nursing education. Unsurprisingly, IPT training can also be classified under the IPE umbrella.

Researchers argue that to prepare the students for future interprofessional work, they should preferably engage in some form of "interprofessional learning" (e.g. Ponzer et al., 2004; Reeves et al., 2009a, 2010a, 2013). This implies a "learning by doing" principle. Thistlethwaite (2012) contend, "*The rationale for IPE is that learning together enhances future working together.*"

1.1.4 The Norwegian Medical and Nursing Education

Norway is one of the 47 signatories of the Bologna Accords (Bologna Process) that aims at creating a "European Higher Educational Area" by introducing comparable and standardized academic programs throughout Europe. The process required the participating countries to implement a common "qualification framework" by 2012. Norwegian educational programs should be seen against the backdrop of this evolving European requirement (Qualification Framework for Higher Education, 2009).

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The Norwegian educational system constitutes a centralized framework with government control of education and authorization of physicians and nurses. The educational institutions are classified as either universities or university colleges.

Four universities in Norway offer medical education leading to the MD degree. Nursing students may attend (2015) one of 25 University Colleges that award the bachelor's degree in nursing (RN degree). In addition, three universities offer bachelor's degree programs in nursing (RN degree).

The MD programs correspond to 360 European Credit Transfer and Accumulation System (ECTS) points. While the admission criteria are similar, the curricula and study programs of the medical faculties are not subject to detailed regulation and may differ, especially with regard to organization and teaching methods. Coordination of the medical education is done through formal and informal cooperation between the medical faculties (Brenne, 2003; Ringard et al., 2013).

While the regular RN programs require three years, there are part-time programs for students requesting to complete the degree in four. The RN degree corresponds to 180 ECTS (Ringard et al., 2013). In contrast to the MD programs, a common national curriculum defined by the Ministry of Education, regulates all nursing programs (Norwegian Ministry of Education and Research, 2008).

For the past 40 years, Norwegian authorities have stressed the importance of IPT and the need to prepare students for interdisciplinary teamwork (NOU, 1972). In 1995, the Norwegian government recommended that university colleges strengthen the interprofessional content of their programs. MD programs were exempt from these recommendations. The implementation was left to each college and without extensive coordination the process led to different strategies of deployment, ranging from uniprofessional programs to joint educations for a range of related professions (Almås & Barr, 2008). Uniprofessional education refers to students of a single profession learning together (Freeth et al., 2005).

All nursing education has been based on a national curriculum with guidelines framed by the Ministry of Education and Research. Since 2008, a basic

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requirement has been that “*nurses shall have learned to be team players and be able to cooperate with users and other professions*” (Norwegian Ministry of Education and Research, 2008, p.4). According to the guideline, all nursing programs should include a course on “Communication, cooperation and conflict management” (p.8).

In 2011, following WHO recommendations, the Norwegian Ministry of Education (St.M 13 2011-2012; WHO 2011) recommended that undergraduate students in healthcare and medicine complete IPT training, making collaborative competence an educational objective. Nonetheless, it has been difficult to create effective interprofessional training programs (Clark, 2011; Aase et al, 2013).

1.2 The Research Purpose

Few studies have explored students’, faculty members’, and clinical practitioners' conceptualization of IPT prior to implementation of training measures. Additionally, previous studies have not addressed such conceptualizations across stakeholder groups.

Against this backdrop, the purpose of this thesis is to give in-depth accounts of the stakeholders’ perceptions, experiences and recommendations of importance for IPT training in healthcare education, with the intention of improving the knowledge base for planning, designing and implementing such training.

The students’ perceptions are of special interest; the literature has paid minimal attention to the student perspective (Brooman et al., 2015). Following Cook-Sather (2014), I surmise that student experiences may play an important role in informing teaching and training practice.

This research has the following objectives:

- to explore the status of IPT training in the context of the Norwegian education of medical and nursing students.
- to develop a conceptual understanding of IPT training in healthcare, based on the perspectives of the stakeholders.
- to develop and conduct a pilot IPT training session for nursing and medical students.

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In order to achieve the objectives, four sub-studies were designed, which resulted in the four papers that are enclosed in Part 2 of this thesis. For clarity, the papers are here enumerated No I-IV. For each sub-study research questions were formulated, resulting in a total of seven research questions as summarized below:

1. What are the commonalities and differences in the IPT content adopted in the curricula of the various institutions? (Paper I)
2. How are the components of IPT embedded in nursing and medical curricula in Norway? (Paper I)
3. What are students' perceptions of their professional roles in the context of IPT? (Paper II)
4. How do students perceive IPT arenas? (Paper II)
5. How do the relevant stakeholder groups perceive the content of interprofessional training in the education of nursing and medical students? (Paper III)
6. What characterizes interprofessional communication among nursing and medical students in a simulation-based training session and how do students describe it? (Paper IV)
7. How do nursing and medical students perceive the use of SBAR¹ in a simulation-based training session? (Paper IV)

1.3 The study context

The context of this study is the Norwegian educational system for nursing and medical students. Two university faculties: a medical school at one university, and a nursing school at another university, respectively, as well as a hospital in which the students had their clinical training, were involved. Nursing and medical students who had been exposed to IPT during their clinical training participated in this study, along with university staff engaged in theoretical teaching, and clinicians involved in clinical training. An analysis of study

¹ SBAR – Situation, Background, Assessment and Recommendation – is a communication tool constructed to function as a checklist and to structure the team's exchange of information (Haig, Sutton & Whittington, 2006). [this is repeated in the text, so it doesn't need to be defined here.]

programs and curricula for nursing and medical students was used as a starting point for this PhD-work.

1.4 The study phases

Figure 1 depicts the study phases. Phase 1 contains research papers I, II and III. Phase 2 comprises the development and implementation of the IPT pilot training session, and the analysis of the participants' perceptions, as described in research paper IV.

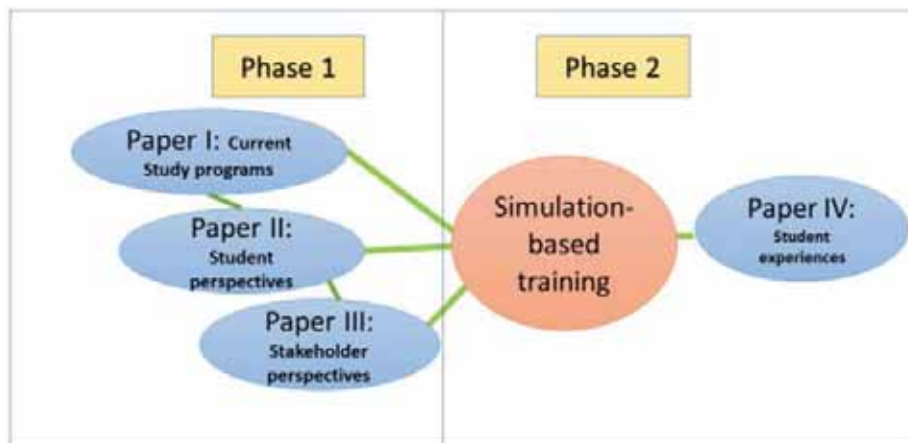


Figure 1: The study phases

1.5 Structure of the thesis

The PhD thesis consists of a synopsis and four papers. Part 1 consists of six chapters. The first chapter introduces the theme and the aim of the study; the second chapter presents theoretical perspectives relevant for IPT training in education and outlines previous research. Chapters 3-5 are concerned with methodology, review of results, as well as discussion of the results, respectively. Chapter 6 offers conclusions and recommendations for further research.

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Part 2 contains the four research articles, papers I-IV:

Paper I: Aase, I., Aase, K., & Dieckmann, P. (2013). Teaching IPT in medical and nursing education in Norway: A content analysis. *Journal of Interprofessional Care*, 27, 238-245.

Paper II: Aase, I., Hansen, B.S., & Aase, K. (2014). Norwegian nursing and medical students' perception of IPT: A qualitative study. *BMC Medical Education* 14, 170-179.

Paper III: Aase, I., Hansen, B.S., Aase, K., & Reeves, S. (2015). Interprofessional training for nursing and medical students in Norway: Exploring different professional perspectives. *Journal of Interprofessional Care*, 30(1):109-115. DOI: 10.3109/13561820.2015.1054478.

Paper IV: Aase, I., Bjørshol, C., Dieckmann, P., Aase, K. & Hansen, B.S. (2016). Interprofessional communication in a simulation-based team training session in healthcare: A student perspective. *Journal of Nursing Education and Practice*, 6 (7), 91-100.

2 Theory

This chapter reviews the literature to present the most salient concepts and research pertaining to interprofessional teamwork (IPT), interprofessional education (IPE), and IPT training. I also explore the theoretical perspectives that can be used to examine or interpret IPT training.

2.1 *Interprofessional teamwork (IPT)*

The term *interprofessional* implies that a relation reaches across different professions such as nurses physicians, psychologists etc. Even though *interprofessional* is a widely accepted term, *multidisciplinary*, *interdisciplinary* and *multiprofessional* are frequently used synonymously (Thistlethwaite, 2012). However, with its focus on collaborative relationships, the term *interprofessional* is preferred here, in compliance with the practice of WHO (2010).

WHO defines IPT as “*collaborative practice, which happens when multiple healthcare workers from different professional backgrounds work together to deliver highest quality of care*” (WHO, 2010, p.7). Introducing concepts associated with teamwork, Reeves et al. (2010b) expanded the IPT definition to suggest that IPT is “*a type of work which involves different health and / or social professions who share a team identity and work closely together in an integrated and interdependent manner to solve problems and deliver services*” (p. xiv). The authors noted that this definition of IPT in many ways portrays an ideal of what IPT *could be*, not necessarily, what it *is* (Reeves et al., 2010b).

Thistlethwaite and Dallest (2014) commented that a consensus on definition and the meanings of IPT is still contextual and therefore requires clarification. They asserted that *interprofessional* implies something about the quality of the team process and its goals; the adjective connotes collaboration, mutual aims and optimal communication.

A key component of IPT, the concept of *teamwork* deserves some clarification. The term teamwork connotes a shared team identity, clarity, interdependence,

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integration, and shared responsibility. Reeves et al. (2010b) also contended – without much justification, that “*team tasks ... are generally unpredictable, urgent and complex*” (Reeves et al., 2010b, p 45). Salas et al. (2005a) identified five core components of teamwork: team leadership, team performance monitoring, backup behavior, adaptability and team orientation - along with the coordinating mechanisms of shared mental models, mutual trust and closed-loop communication. Without discussing the vast literature on teamwork, suffice it to say that IPT may benefit from adopting the qualities of efficacious teamwork.

Reeves et al. (2010b) discussed some of the factors thought to affect the evolution of IPT, including the growing concern about quality of care, patient safety, and patient-centered care. Furthermore, the ongoing shift towards older patients in western countries, requiring coordinated efforts of many disciplines, may favor IPT. The authors also thematized information technology, virtual teams and a range of social issues such as the increased specialization of healthcare without unequivocal conclusions.

Strauss (1978) pointed out that conflicts and negotiations must be regarded normal occurrences in healthcare groups. A few studies have provided empirical insight into these mechanisms, expected to be defining for team performance. Van Schaik et al. (2014) spent 18 months observing four interprofessional teams in low-acuity environments. The findings revealed that the team members were concerned about tension around hierarchy, safety and leadership, and questioned the leading role of the physicians.

Van Schaik et al. (2014) also discussed the need to customize interprofessional teams to team members’ individual attributes, finding that the desired attribute may be different in low- and high-acuity environments.

2.1.1 Interprofessional communication

Effective communication is of great importance for IPT and lies at the core of quality teamwork and patient safety (Chant et al., 2004; Leonard et al., 2004, Salas et al., 2005b; WHO, 2011). WHO underlines that effective communication implies that “*good health-care teams share ideas and*

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information quickly and regularly, keep written records and allow time for team reflection” (2011, p. 137).

Brock et al. (2013) pointed out that interprofessional team communication relies on skills learned and later modified and reinforced when healthcare workers work collaboratively. The competence to practice safely requires effective communication with patients and colleagues, active listening, assertiveness, respect and timeliness. Failures may occur when vital information is not communicated among team members or when team members misinterpret messages (Brock et al., 2013, p.2).

WHO recommends the following techniques or tools to assist interprofessional communication in healthcare curricula (2011, p. 138-139):

Situation, Background, Assessment, Recommendation (SBAR): a technique for communicating critical information about a patient’s concern that requires immediate attention and action.

Call-out: a strategy to communicate important or critical information to inform all team members simultaneously in emergent situations.

Check-back: a technique for ensuring that information conveyed by the sender is understood by the recipient as intended.

Hand-over or hand-back: the transfer of professional responsibility and accountability for some or all aspects of care for a patient or group of patients to another person or professional group on a temporary or permanent basis. “*I pass the baton*” is a strategy to assist timely and accurate hand-overs.

The tools have slightly different connotations in the literature; closed-loop communication (Salas, 2005a) would for instance correspond to check-back in the WHO framework.

Most of these standardized communication tools have been developed for structured communication in acute settings such as operating rooms or emergency rooms, meaning that there is a need for contextualizing to fit less acute clinical settings (Aase et al., 2016; Leonard et al., 2004; Reeves et al., 2010b).

2.2 *Interprofessional education*

There are compelling reasons to believe that IPE introduced at the undergraduate level will positively affect the students' ability to subsequently become good team players; however, research on this issue is not yet conclusive (WHO, 2011).

A number of studies have been devoted to IPE, many of them designed to confirm that training and educational measures produce the desired results (e.g. Barr, 2002; Ponzer et al., 2004; Reeves et al., 2009a, 2010a, 2013; Thistlethwaite, 2012, Thistlethwaite et al. 2015). In a review paper, Thistlethwaite (2012) concluded, "*there is evidence that IPE creates positive interaction, that it encourages interprofessional collaboration and that it improves client care*" (p.62). However, the conclusion may be debatable; the author admitting, "*there is a lack of longer-term evaluation of IPE*" (p. 62).

Freeth et al. (2005) argued that interprofessional learning does not occur when members of different professions listen to a presentation together or independently access common learning materials, for example in theoretical teaching. Interprofessional learning arises primarily from interprofessional interaction, for example in clinical training. The quality of the interaction influences the quality of the learning (Freeth et al., 2005).

Almås and Ødegård (2010) argued that students with only sporadic cross-disciplinary interactions will have a limited focus on interprofessionalism. Students with relational thinking and action as part of their education are likely to value IPT more highly than those without. This is a result of both socialization and of professional culture.

Many healthcare educational institutions struggle to include interprofessional education in their curricula (e.g. Reeves, 2008; Reeves et al. 2010b; Thistlethwaite, 2012). Frenk et al. (2010) argued for a redesign of the education of healthcare professionals to reach a common strategy across medicine, nursing, and public health. This requires instructional and institutional reforms to achieve two proposed outcomes: transformative learning and interdependence in education. Transformative learning shifts the educational perspective from professional credentials to the core competencies of effective teamwork. Interdependence in education involves a shift from isolated to

harmonized education and health systems, from standalone institutions to networks, alliances, and consortia.

A research group at University of Toronto developed a workbook with guidance on how to create the healthcare team of the future, titled “The Toronto Model for Interprofessional Education and Practice” (Nelson, Tassone & Hodges, 2014). The model is integrated across all educational sites and professions and includes classroom, simulation and practice-based education. The checklist-based workbook focuses on getting everyone to practice, finding common curriculum time, making it mandatory, finding clinical practice placements, recruiting faculty, and making the education and practice sustainable (p. 4).

Considered part of IPE, IPT training curricula are being established in many countries, including Norway (e.g. Almås & Barr, 2008; Nielsen, 2010; Wisborg et al., 2006). This underlines the need for in-depth studies of such training initiatives using multiple knowledge sources, exploiting data obtained from students and other stakeholders in order to create a better understanding of the processes involved and expand and deepen the knowledgebase for optimizing and designing such training.

2.2.1 IPE effectiveness and learning outcomes

Measurements and evaluation of the effect of IPE efforts have proved notoriously difficult (Thistlethwaite, 2012). Researchers have attempted to use students’ *satisfaction* to gauge the effect of interprofessional training on learning, mostly by querying the students after the training. However, this procedure has drawn almost invariably positive responses, raising the question of the credibility of the results (e.g. Barr, 2002, Ponzer et al., 2004; Reeves et al., Reeves et al., 2009a, 2010b, 2013, 2015; Thistlethwaite, 2012). Reeves et al. (2015) argued for the need to use other types of knowledge data to address the processes associated with ITP training.

The knowledge, skills, and abilities that students have attained as a result of their involvement in a particular set of educational experiences are referred to as their *learning outcomes*. (Qualification Framework for Higher Education, 2009; St.M 13, 2011-2012). In their review of IPE learning outcomes,

Thistlethwaite and Moran (2010) synthesized six categories that could be used as a basis for addressing learning outcomes: teamwork, roles/responsibilities, communication, learning/reflection, the patient, and ethics/attitudes. The categories are broad and need further debate and operationalizing.

Traditionally, the effectiveness of interprofessional education efforts have been evaluated using Kirkpatrick and Kirkpatrick's (2008) four-level model: (a) reaction (how much the students liked the training effort), (b) learning (skills learned), (c) behavior (resulting change in behavior), and (d) results (outcomes, changes in practice). Salas et al. (2012) argued that the evaluation of the training could serve several purposes, for example optimizing the training program and providing feedback to the trainees and/or facilitators. The organizers of training should start the evaluation by stating the purpose, in order to compile the data and perform the analysis needed by the stakeholders (Salas et al., 2012).

Institute of Medicine (IOM, 2015) has highlighted the need to move beyond examining the impact of IPE on learners' (students') knowledge, skills and attitudes to a focus on the link between IPE and performance in practice. Only recently have researchers begun to look at such issues as patient safety, patient and provider satisfaction, quality of care, health promotion, population health, and the cost of care. These effectiveness relationships are complex and might require reconsidering how, where and with whom IPE takes place.

The above consideration of IPE is relevant for the ensuing discussion of IPT training. However, a full assessment IPE effectiveness and learning outcomes are beyond the scope of the current study.

2.2.2 Designing interprofessional training

The type of training measures needed to educate students for teamwork can be debated from pedagogical, economic and technical perspectives (Kraiger, 2008; Reeves et al., 2010b). At the most basic level, most researchers agree that students need to work in teams in order to learn the dynamics and mechanisms that operate in a team setting (Salas et al., 2012; Thistlethwaite, 2012; Wenger, 1998).

In a comprehensive review, Salas et al. (2012) presented an analysis of training in organizations, and argued that training design is not as intuitive as it may

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appear, and that training should be regarded as a systematic process guided by scientific research.

In order to harness the potential of systematic training, Salas et al. (2012) offered a range of tools largely supplied by learning theory and research on training. The framework addresses the time before, during and after the training. This permits analysis of preparation, training execution and strategies for retention of acquired knowledge and skills.

Before training, a Training Needs Analysis (TNA) should diagnose the type of training is needed; for whom, and within what type of organizational systems. A well-conducted TNA can determine whether training is a better alternative than non-training. The analysis can be broken down into components, including *job-task analysis, organizational analysis and person analysis* (Salas et al., 2012)

Another critical issue to consider *before training* is the learning climate. According to Salas et al. (2012), communication should center on the benefits of training, balance mandatory and optimal training requirements, involve the mentors early, and reduce skills erosion by scheduling the training shortly before the students will be practicing what they have learned. Use of technology should be justified, and training costs should be monitored and modeled (Salas et al. 2012, p. 83).

During training, focus should shift to the individual characteristic of the trainees, such as self-efficacy, goal orientation and motivation to learn. Salas et al. (2012) suggested basing the training strategy on information (i.e. concepts, facts, and information the participants need), demonstration (desired behavior, attitudes), practice (opportunities to learn, objectives, appropriate stimulation), and feedback (actionable, task focused).

After training, the organizational context has an equal impact on the training effectiveness as the actual training session. After the students have completed training, supervisors should express positive attitudes towards the training, remove obstacles, and ensure opportunities for students to apply what they have learned and to receive feedback. Debriefing is important since it provides an opportunity to self-correct and to reinforce what is working (Salas et al., 2012).

2.2.3 Simulation-based training

Simulation seems to offer an effective way of learning teamwork; modern technology can be exploited to facilitate realistic training without exposing patients to risk (Dieckmann, 2009; Salas et al., 2005b). Simulation-based training is believed to be effective across several industries and is increasingly exploited in healthcare education. Several studies have shed light on how and why simulation-based training works (e.g. Brannick, Prince & Salas, 2005; Dieckmann et al., 2012; Marshall & Flanagan, 2010; Rystedt, 2002). Well-designed simulation can enhance learning, improve performance, and minimize errors (Salas et al., 2012). Yet, the empirical and theoretical understanding to guide design and implementation is still immature (Reeves et al., 2010b) and simulation-based training is the focus of an active research field.

Of the many aspects of simulation theory (Dieckmann, Gaba & Rall, 2007; Jeffries, 2007), two notions seem especially relevant: fidelity and “as if.” Fidelity, which has ramifications such as psychological or social fidelity, reflects how well the simulation emulates reality. Despite a widespread belief that a high fidelity and detailed simulation will optimize learning, the actual evidence is scarce (Dieckmann, Gaba & Rall, 2007; Østergaard et al., 2011). Still, it is safe to say that the level of fidelity should be sufficient to anchor the simulation to the clinical training case, and provide enough detail to generate questions and interactions.

A cornerstone to simulation is the “as-if” concept, by which the participants should accept the simulated training case as if it were reality, both at a physical-mechanical and a psychological-emotional level (Dieckmann, Gaba & Rall, 2007). This idea – called “immersion” or “immersive simulation” – sets simulation apart from more passive and descriptive learning methods (Beaubien & Baker, 2004; Sharma et al., 2011). According to many authors, immersion is likely to lead to a deeper understanding of the simulated training scenario (Dieckmann, Gaba & Rall, 2007).

This study organizes simulation with a level of fidelity and immersion attuned to the IPT training, involving both medical and nursing students.

Corresponding to the team design of Salas et al. (2012) – i.e. the process notions of before, during, and after training – simulation-based training can be

structured with phases such as planning, briefing, simulation-scenarios, and debriefing (Dieckmann, 2009). Planning of simulation-based training would involve a training need analysis and assessment of participants, training measures, case scenarios and fidelity. Briefing should include a demonstration of simulation-setting and training scenarios. The purpose of the debriefing is to encourage students to explore their own and others' practices (Flanagan, 2008).

2.3 *Review of previous research*

In the following, I will review research constrained by the terms: *IPT*, *training*, and *medical and nursing students*. Applying different combinations of the search terms, the literature searches were based on the Academic Search Premier, Cinahl, and Medline databases restricted to 2005-2015. The searches resulted in approximately 60 research articles after removing duplicates and screening of the abstracts. In addition, hand searches of a selection of research papers using the snowball effect were conducted.

Research on IPE evaluation was found to dominate the literature on IPT training in an educational setting. The research articles encompassed evaluations of training, including more specifically training wards, simulation, clinical training, and training tools. Almost all of the articles used quantitative methods including surveys distributed pre- and/or post-test. This is consistent with the findings of Reeves et al. (2015), who recognized the same trend in publication.

One of the few qualitative studies was published by Wilbur and Kelly (2015), who queried undergraduate nursing and pharmacy students regarding their perceptions of their collaborative roles, with the aim of informing interprofessional education initiatives. The authors found that basic understandings of one another's roles were exhibited, but tended to closely follow traditional role patterns that are common in the Middle East.

Training ward is a "Nordic concept" where students from different health professions collaborate for 2-3 weeks of clinical training. A number of research articles has evaluated the students' perceptions, suggesting that students learn IPT, strengthen their own professional roles, and work together for the benefit of the patient (e.g. Brewer & Stewart-Wynne, 2013; Hylin et al., 2007). Lidskog

et al. (2008) also confirmed the positive role of training wards, but highlighted that the learning must be understood in light of the contextual setting. The setting needs to be realistic and relevant in relation to future roles for the student groups involved.

Simulation-based training was reported in several articles, all of them using quantitative pre- and post-test evaluations. These studies documented improvements in the students' collaborative skills, self-reported team-based attitudes and behaviors, self-confidence and perception. The simulation-based scenarios encompassed a range of settings, including operation room, resuscitation, obstetrics, pain assessment and management of palliative care, physiological deterioration, and communication (e.g. Tofil et al., 2014; Garbee et al., 2013; Zhang, 2013; Paige et al., 2014; Brock et al., 2013; Sigalet et al., 2015; Salam et al., 2015; Stefanidis et al., 2015). Several of the studies evaluated questionnaires or – in some cases - observation tools, confirming the reliability and validity, as well as the applicability for students, researchers and observers (e.g. Chiu, 2014; Hall et al., 2011; Morgan et al., 2015; Sigalet et al., 2012, 2013; Zhang et al., 2015).

Two of the research articles were systematic reviews of teamwork training interventions in medical education (Chakraborti et al., 2008), and IPE in allied health (Olson & Bialocerkowski, 2014). Both reviews emphasized the need for introducing more teamwork principles into the curricula. Olson and Bialocerkowski (2014) also confirmed that research on IPE evaluation remains a manifest trend.

In sum, evaluations of different training interventions tend to dominate the literature. Few studies explicitly apply theoretical or inductive approaches to understand the processes behind IPT training. There is also a lack of research devoted to the students' roles and engagement in training design.

2.4 Relevant theoretical perspectives

IPT training and education include a complex array of factors, and numerous theoretical contributions may illuminate the design and results presented here. An overall categorization of relevant theoretical perspectives can be structured according to a *pedagogical*, *psychological*, or *sociological* perspective. In

addition, a *patient-centered* perspective would be of relevance, in particular for IPT training involving patients either as passive (e.g. manikin) or active (e.g. real patients or persons acting as patients) participants in the team.

So far, the pedagogical and psychological perspectives have dominated the literature on IPT training; a sociological perspective has been less prevalent. A patient-centered view on IPT has been mostly absent until recently (Hean et al., 2013; Reeves & Hean, 2013; Coulter, 2011). Below, we will elaborate the four perspectives by presenting a set of selected theories.

2.4.1 A pedagogical perspective

The research literature on teamwork and training commonly apply different learning theories (e.g. Stocker et al., 2014). The most frequently used learning theory on IPE is the socio-cultural perspective described by Säljö (2001), based on Vygotskij's work assuming that learning occurs as a result of language and social practice (1986). This perspective thus encompasses knowledge creation through interaction as opposed to learning as a solitary process (Säljö, 2001). The use of learning artefacts is vital in this perspective, meaning that learning is mediated through participants' interaction with artefacts and tools.

Closely related to the socio-cultural theory is Wenger's theory on communities of practice (1998) focusing on practice as the core arena in which a community (e.g. a profession or a student group) develops, shares and maintains its learning. A community creates the social fabric for that learning, fostering interactions and encouraging a willingness to share ideas. A domain of knowledge (e.g. clinical skills) creates common ground, inspires members to participate, guides their learning and gives meaning to their actions (Wenger et al., 2002).

In this study, a socio-cultural or communities of practice perspective would imply the use of "activity" (i.e. educational teamwork training efforts) as the unit of analysis, not the individuals (i.e. students and/or different stakeholders). As such, the focus would be the interaction amongst the study participants. This perspective was adopted in phase 2 (paper IV) of the project, while in phase 1 (papers I-III) the focus was on study programs, individuals, and shared meanings.

2.4.2 A psychological perspective

In contrast to the pedagogical perspective that emphasizes learning theories, a psychological perspective would include descriptions of the unconscious processes that take place in teams.

Within the psychodynamic tradition, Menzies-Lyth (1970) developed a theory of social defense highlighting two major tasks of healthcare teams: 1) patient care; and 2) maintaining the team (e.g. managing team relations). Under stressful circumstances, and in teams with poorly defined goals and leadership, the second task could dominate the first one as a mechanism of coping with the stress. Menzies-Lyth (1970) pointed out that under such circumstances, the team members could adopt coping strategies such as denial of evidence and withdrawal from the collaborative teamwork.

Part of the psychological perspective, the cognitive tradition has emphasized the concept of *non-technical skills*, which has gained widespread recognition within the teamwork literature (Flin & Maran, 2004; Glavin & Maran, 2003; Gaba, 2011; Lyndon, 2006).

Flin et al. (2003) described *non-technical skills* as cognitive and social skills that complement worker's technical skills. These cognitive, social and personal skills may contribute to safe and efficient performance. Crew resource management (CRM) training is one of the established methods, designed to reduce human error by exploiting non-technical skills such as situational awareness, decision making, and teamwork (Flin & Patey, 2009).

The timing of such training is important for successful application in healthcare. Education in non-technical skills should be delivered early to healthcare students as part of their core curriculum in order to establish a common understanding and vocabulary. Failure to include CRM principles and practices in the undergraduate course could result in the training being undervalued, even if offered after qualification (Flin & Patey, 2009).

2.4.3 A sociological perspective

A sociological perspective is concerned with the functioning and development of IPE and IPTs understood as social entities. One influential theory – when it

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comes to healthcare organizations – is the negotiation order theory of Strauss (1978). Strauss contended that micro-level negotiation and interactions between individuals profoundly control organizational functions and meaning. Negotiation between individuals (e.g. bargaining, compromising, and mediating) creates and shapes organizational rules and structures, consequently contributing to the development and maintenance of social order within an organization. Strauss (1978) subsequently modified his theory arguing that although micro-level negotiations were central, they were also constrained by structural influences.

Several studies have corroborated the negotiation order theory (e.g. Allen, 1997; Busch, 1982; Reeves et al., 2009b; Svensson, 1996). Seeing the social order of the ward as a negotiated order, Svensson (1996) explored the nature of nurse-doctor negotiations linked to patient care decisions.

Allen (1997) used negotiated order theory to address the interplay between nurses and physicians in an acute hospital setting. The results suggested that nurses' difficulties with contacting doctors often caused them to undertake medical tasks themselves, such as initiating a clinical investigation. This has been characterized as evidence of a "non-negotiated" order between the professions, a dimension that Strauss might have overlooked.

Within the sociological tradition, Reeves et al. (2010b) developed four domain factors for understanding IPT: relational, processual, organizational and contextual. The authors argue that the four domains can all affect the performance of IPT.

Relational factors may directly affect the relationships shared by professionals such as professional power, socialization, team compositions, team roles and team processes. For example, hierarchical differences among team members can undermine the quality of their relations. Roles that members adopt can either generate friction (if roles are unclear) or support team performance (if roles are negotiated and agreed).

Processual factors include space and time, routines and rituals, IT, unpredictability, urgency, complexity and task shifting. These factors affect the way in which teamwork is carried out across workplace situations. For

example, too little time and too many demands can result in professionals having limited opportunity to strengthen their collaborative work.

Organizational factors include organizational support, professional representation and the fear of litigation -- impact the organizational environment of the interprofessional team. Organizational resources and time are key to the functioning of interprofessional teams.

Contextual factors are related to the social, political and economic landscape in which the team is located, including its culture, diversity, gender, economics and politics. “*Focusing on these factors adds width to issues surrounding teamwork. Differences in financial rewards may for instance emphasize different values among different team members*” (Reeves et al., 2010b, p. 76).

Two empirical studies have adopted an approach based on the four domain factors. Shunk et al. (2014) studied the design, development and implementation of an innovative huddle coaching program in a team-based medical home. The “huddle” being a semi-formal meeting summoned prior to the daily round. The authors identified relational factors as the most critical domain of the program. They also discussed processual factors, contextual and organizational factors affecting the new program. Hartog and Benbebishty (2015) studied nurse-physician conflicts in intensive care units, categorizing them according to the four domains, which were also applied to discuss measures for resolving the conflicts.

2.4.4 A patient-centered perspective

Although ambiguous, the term *patient-centered care* is widely used (Mead & Bower, 2002; Epstein & Street, 2011). Sometimes known as *person-centered*, *patient-focused*, *client-centered*, *personalized* or *individualized care* (e.g. Coulter, 2011; McCormack & McCance, 2010), its aim is to ensure that staff advocates for patients, that care delivery meets patients’ physical, emotional and social needs, that interactions with staff are informative, emphatic and empowering, and that the patients’ values and preferences guide all clinical decisions (Coulter, 2011; IOM, 2001). WHO (2011) emphasizes the importance of patient-centered care.

The practice of patient-centered care implies an obligation for the staff to identify with the patient and obtain a sufficiently deep understanding of the patient's value base (McCormack & McCance, 2010).

The patient-centered perspective arguably leads to profound changes in educational efforts and interprofessional training by introducing the patient as a subject with values and preferences that must be factored into the teamwork training. Therefore, in training exercises the presence and role of the patient must be accounted for, either by advanced technology that allows manikins to emulate human behavior – or by instructing students, facilitators or even actors, to represent the patient (Coulter, 2011; Jefferies, 2007) .

In addition, in today's multi-cultural society, adopting a patient-centered perspective is likely to demand a greater component of cultural competence and skills in healthcare and education, including IPT and IPT training. Under the right circumstances, the patient can play a valuable role in the education of the students (Coulter, 2011; Jefferies, 2007).

Of great interest for this study, the patient-centered perspective plays an important part in the discussion of papers III and IV.

2.5 Theoretical approach

Due to the explorative, descriptive and grounded nature of this thesis, different theoretical perspectives have enlightened and matured the analyses. As such, the theoretical positioning has been eclectic, borrowing from the different perspectives presented above.

The sociological perspective has been influential by introducing a holistic view of IPT training, paying attention to the overall organizational and contextual factors, but also to the relational and processual factors. The sociological approach has permitted the introduction of key notions like roles, interactionism, negotiation and professions. The case study, framed on the Norwegian educational system, is also understood in mainly sociological terms.

The psychological perspective has been influential in the thesis by introducing psychodynamic notions to explain the status of the patient in micro-level

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assessment of team performance (Menzies-Lyth, 1970). Moreover, the patient role in IPT training has been discussed in light of the psychological perspective.

The patient-centered perspective provides the foundation for introducing the patient as part of a conceptual framework for IPT training in an educational setting.

The pedagogical perspective has been influential in allowing certain elements of learning theory be exploited for simulation-based IPT training, including recommendations pertaining to timing, structure and organization. Of particular interest is the necessary degree of fidelity and immersion. Moreover, this study has adopted a fundamental tenet of learning theory as expounded by Thistlethwaite (2012) and Wenger (1998), namely that teamwork is best learned by learning in teams.

3 Methodology

This chapter discusses the methodological approach adopted in the thesis, including a brief introduction to the philosophical underpinnings of the methodology. I then describe the research design, data collection, participants, data analysis, researcher's role, ethical considerations, trustworthiness, and methodological limitations of the study.

3.1 *Philosophical underpinnings*

A study of IPT training can be expected to evoke engagement at sociological, psychodynamic and emotional levels, touching on phenomena and relations that are difficult to articulate and conceptualize. This elusiveness suggests a research approach grounded in interpretivism, which is rooted in a desire to understand human behavior as a “text” with layers of meaning (Dilthey, 1911/1977). The interaction between the researcher and the participants is essential to build the trust and mutual understanding needed to clarify and conceptualize their perspectives.

Against the backdrop of interpretivism, *social interactionists* have sought to distill “meaning” by focusing on group actions and interactions. In the study of healthcare teams, interactionism has mostly taken the form of symbolic interactionism that highlights interactions facilitated by words, gestures and other symbols. Symbolic interactionism is a major framework of sociological theory and the principal underlying methodological perspective of this study (Miles & Huberman, 1994).

Theoretical models of IPT have yet to be developed and consolidated to attain a degree of consensual acceptance across the scientific communities (Reeves et al., 2010). This suggests that conceptual models – and theory-building -- must rely on inductive reasoning grounded in analysis of data. In this study, this approach is inspired by the theory-building processes adopted in grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998) and content analysis (Graneheim & Lundman, 2004).

However, the inductive paradigm does not exclude deductive pathways to introducing theoretical concepts. Certain concepts may be introduced deductively through theory (Eisenhardt, 1989; Strauss, 1978) or bolstered by theoretical consideration if the data basis is faltering. An example of the latter is the introduction of “patient-centered care” in this thesis.

Inductive reasoning has been widely adopted in scientific communities, despite certain logical concerns. Grounded theory is for example an inductive method (Glaser, 1998). The concepts distilled in this study are mainly due to an inductive approach even if deductive elements are exploited. An interesting question is whether the inductive reasoning naturally leads to philosophical pragmatism (Reeves & Hean, 2013). I certainly believe that the conceptual model developed in this study should be regarded as a pragmatic construct, which refrains from claiming to be a mirror image of the reality (Dewey, 1929).

3.2 Research design

The methodological approach taken in this thesis is qualitative. In general, qualitative methodology provides tools for exploring social phenomena and human experiences (Polit & Beck, 2008; Reeves, 2010). Within the qualitative methodological approach, this study employs an explorative and descriptive case study design (Yin, 2014).

Precipitating a typology rich with subunits, the notion of a “case study” has been subject to theoretical discussion (Eisenhardt, 1989). Here, it suffices to point out that a case consists of a set of phenomena (Yin, 2014) that is limited by – or conditioned on – certain well-defined boundaries. The case phenomena may be referred to as case *content* or *theme*. Typically embracing people, groups, professions, organizational units and even ideas, the phenomena may display great diversity. The case boundaries may be of structural character, such as physical premises, policies or professional roles (Yin, 2014). They enable the researcher to focus attention and resources; however, they also constitute an obstacle to generalizing the study results. Case studies may be conducted for several reasons, including exploring and describing phenomena, verifying and corroborating existing notions, shaping hypotheses and creating theory (Eisenhardt, 1989).

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In this study, the case content focuses on the perspectives of different stakeholders - such as students, teachers, and clinicians – with regard to IPT and IPT training. Moreover, the data obtained by observations were added to the case content. The case boundaries include the Norwegian educational system for nursing and medical students, and two specific universities (a nursing school and a faculty of medicine) and a university hospital.

The current study design is explorative because of the novelty of the case: bringing together students, teachers, and clinicians for a systematic qualitative inquiry of the perspectives, ideas, and practices underpinning IPT training in a pre-graduate educational setting. The outcomes of such an effort have yet to be systematically analyzed and described in the literature. Furthermore, the study presents a conceptual framework for IPT training that transcends the explorative process reaching into theory building.

3.3 Qualitative data collection

Data collection in qualitative studies embraces a range of– methodological procedures (Yin, 2014). Underpinning these procedures are data sampling strategies.

3.3.1 Sampling strategy

Qualitative data sampling is typically purposive, governed by pre-determined procedures and principles (Polit & Beck, 2008). But for the background information gathered from the study coordinators (paper I), this study was grounded in data “within” the case. Furthermore, the sampling spanned many levels, including national policies, institutional study programs, stakeholder groups (students, teachers, clinicians), and their individual members. Reflecting the above, this study has a nested “within-case sampling strategy” (Miles & Huberman, 1994). Within the case, the sampling was guided by semi-formal interview guides, and driven by the effort to unveil the most relevant perspectives of the stakeholders and generate a broad range of ideas.

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3.3.2 Data sources

As displayed in figure 1 (chapter 1) this study consisted of two study phases with corresponding data sources. Table 1 depicts the two study phases together with objectives and data sources.

Study phase	Objectives	Data sources
1	Current status, training needs, stakeholder perspectives, training contents	Documents (study programs, educational system) E-mail based questions Individual interviews Focus group interviews Observations
2	Developing and testing of a simulation-based training session, study students' interprofessional interactions	Observations Debrief discussion sessions

Table 1: Study phases with corresponding data sources

The choice of data sources was based partly on a triangulation strategy (Polit & Beck, 2008; Yin, 2014). However, practical issues and available resources limited data acquisitions.

The main data sources were individual and focus group interviews, in addition to debrief sessions, all semi-formal in design, conducive to dialogue rich in reflection, interaction, and new perspectives and ideas (Morgan, 1997). In general, individual interviews are expected to yield in-depth explanation and personal perspectives. However, the data collection procedure is less efficient – and likely narrower – than focus group interviews (Polit & Beck, 2008; Yin, 2014). A major advantage of focus group interviews is allowing the researcher

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to obtain the perspectives of many individuals in a short time, which translates into acquiring data efficiently. The process of sharing and comparing self-reported behaviors and experiences is a valuable component of focus groups, potentially leading to richer and deeper expressions of opinion (Polit & Beck, 2008; Morgan, 1997). The use of the term *semi-formal* in relation to the interviews conducted in this study is justified by balancing the need for a free flow of ideas with the need to cover certain pre-conceived issues and questions. To achieve the correct balance, I participated in all data collection activities ensuring that the co-researchers and/or moderators and facilitators followed the guidelines.

The debrief discussion sessions were arranged after the interprofessional team training sessions in study phase 2. The debrief sessions allowed the participants to reflect collaboratively on the training interactions and learning experiences. Following Fanning and Gaba (2007), the debrief sessions were supervised by trained facilitators.

Observation was used as a data source in both phases of this study. In phase 1, hospital IPTs were observed during clinical practice involving nurses and physicians. In phase 2, observations were carried out during simulation and debrief sessions arranged for nursing and medical students. Observation is particularly suitable as a data collection method in studies of complex situations (e.g. IPT), as it provides “here-and-now” experiences (Polit & Beck, 2008; Lincoln & Guba, 1985).

Observation amasses data in a less interpretive manner than interviews, and may serve as a corrective to interview based techniques. This is particularly relevant when the researcher is non-participating, as was the case in this study (Polit & Beck, 2008, Reeves et al. (2008).

E-mail based questions were submitted to the study coordinators in phase 1 of the study, with the aim of assessing the status of IPT as background for the study. The email exchange was supplemented with telephone conversations when the study coordinators failed to respond to the e-mail. The information gathered was treated as part of the qualitative approach.

Administrative and managerial documents were used as a data source. These documents comprised the study programs maintained by the study coordinators

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of the nursing schools and the faculties of medicine in Norway. Moreover, national policy documents for healthcare education such as framework plans and reports to the Storting (White Papers) were included.

3.4 Sub-studies, participants and data materials

The study consisted of four sub-studies corresponding to the four papers included in the thesis. Table 2 summarizes the four sub-studies with participants, data collection methods, and data analytical approach. The term *huddle* refers to the semi-formal meeting held prior to the daily round in a hospital ward.

Sub-studies	Participants	Data material	Analytical approach
Paper I (Phase 1)	28 nursing schools, 4 faculties of medicine	32 study programs (520 p.)	Content analysis
	32 study coordinators	Responses to 3 e-mail based questions (3 p.)	Brief summary
Paper II (Phase 1)	12 medical students, 10 nursing students	Focus group transcripts (90 p.)	Content analysis
Paper III (Phase 1)	Approx. 23 nurses and physicians in clinical practice (huddle, daily round)	Observational field notes (20 p.)	Content analysis
	6 nursing supervisors, 6 nursing teachers, 22 students (12 medical, 10 nursing students, as in paper II)	Focus group transcripts (60 + 90 p.)	
	4 physicians (teachers/supervisors for medical students)	Individual interviews transcripts (50 p.)	
Paper IV (Phase 2)	26 medical students, 22 nursing students	Debrief transcripts, observational field notes (138 pages)	Content analysis

Table 2: Overview of the four sub-studies

The four sub-studies will be described below. Educational institutions participating in the study have been anonymized. For simplicity, I refer to the two collaborating universities as University 1 and University 2.

3.4.1 Paper I

This sub-study assesses the status of the teaching of IPT at Norwegian faculties of medicine and nursing schools. The study commenced by analyzing the study programs issued by the 32 healthcare education institutions in Norway. The documents were coded and analyzed to provide an overview of how the schools offered and delivered education and training for IPT.

The study programs of 28 nursing schools and four medical schools were downloaded from the internet site *samordnaopptak.no*, a student portal serving all Norwegian higher educational programs. All study programs were written for the academic year 2010-2011. Ranging from 8-28 pages, the programs varied in length and in detail. The programs included an introduction, aim of the study, and learning outcomes related to knowledge, skills and attitudes.

Each educational institution has a dedicated study coordinator responsible for updating and maintaining the study programs. To assess the status of IPT at the institutions, an email was sent to the 32 study coordinators. The email described and underlined the importance of IPT as described in national documents (e.g. St. M. no.47, 2008-09; Report to St. M. no.13, 2011-12). The study coordinators were asked to respond to three questions: (1) Do you teach the theme interprofessional teamwork/interprofessional communication? (2) Do you have clinical training/simulation in relation to theme interprofessional teamwork? (3) If yes to question 2, what other groups of students are included?

The responses to questions 1 and 2 were limited to “yes” or “no”; question 3 could be answered as free-text. The responses were summarized to represent the status of lecturing and training related to IPT in nursing and medical education.

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A minority of the study coordinators responded within the timeframe given, those who did not, received an email with a gentle reminder. If they still failed to respond, I telephoned them encouraging them to submit their answers to the three questions. The process ended after responses from all 32 study coordinators were received.

3.4.2 Paper II

The second sub-study investigated how medical and nursing students perceived their roles in IPT. In compliance with an interpretive approach, the focus group interview was chosen to allow interaction and reflection amongst the students.

Twenty-two students (10 nursing and 12 medical students) participated in four focus groups interviews. An interview guide (Appendix 1) to be used by the moderators was compiled and pilot tested with nursing students. The guide included different aspects of IPT (e.g. students' perceptions of their professional roles in IPT, and arenas for IPT). The interviews were held either in a training center or at the hospital where the students had their clinical practice. All interviews were transcribed and coded. The medical students were all from university 1, while all nursing students were enrolled at university 2. Both student groups received clinical training at the same regional hospital, and had some exposure to IPT either in an educational or professional setting.

The students participated on a voluntary basis. The nursing students were invited using *It's learning*, a web-based student portal for educational institutions in Norway. The medical students were recruited through their supervisor at the hospital. Four interview groups were formed: one with medical students, one with nursing students, and two groups, consisting of medical and nursing students. The focus group interviews lasted from 45 to 70 minutes and discussions were structured according to the topics of the interview guide. The moderators ascertained a free flow of ideas and perspectives and made sure that all participants were involved.

3.4.3 Paper III

Focusing on stakeholder perspectives (i.e. those of students, teachers, clinicians) on IPT as a part of the education offered to nursing and medical

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students, this sub-study contributed to knowledge base underpinning such training. Focus group interviews were seen as the apposite form of data acquisition. However, to amass more descriptive data of day-to-day activities in a ward, and to anchor the case in real practice (Yin, 2014), field observations were carried out in a hospital ward.

Sixteen hospital and university staff members participated. In addition, the interview material from the four student focus groups of paper II, was revisited and analyzed relative to the purpose of paper III. The participants were recruited through their line managers at the universities and the hospital. The managers were asked to nominate professionals with experience in supervising student teams.

Three focus group interviews were conducted; two groups consisted of hospital nursing supervisors and the third consisted of university nursing teachers (university 2). These groups were uniprofessional since practical and organizational constraints prevented the formation of mixed groups. In addition to the seven (4+3) focus group interviews, the study included data from four individual interviews with hospital physicians (teachers, supervisors at university 1), who were prohibited from joining a focus group for practical reasons.

To deepen my understanding, I complemented the data material by conducting observations following the huddles and the daily rounds undertaken at a hospital surgical ward over a period of one week. The choice of setting for the observations – huddle and daily rounds – was based on data analysis from the student focus groups in sub-study 2 (Aase et al., 2014).

An interview guide (Appendix 2) was developed for focus group and individual interviews, reminding the moderators (one of my co-supervisors and myself) and interviewer (myself) to focus on key issues pertaining to IPT, such as the participants' experiences with teamwork, their understanding of roles and attitudes, and issues to be included in the planning and design of future training efforts. The focus groups were held in the workplace of the participants. All interviews were audio-recorded to ensure accuracy and transcribed before analysis.

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The observations followed an open-ended observation guide (Appendix 3). The observer (myself) mapped the organizational issues, personnel involved, time used, distribution of tasks, interprofessional communication and training-related activities. The field notes were transcribed at the end of each observation day, to be coded and analyzed with the interview material.

3.4.4 Paper IV

Aiming at investigating students' perspectives on IPT and especially interprofessional communication, the fourth sub-study utilized data obtained during and after a simulation-based IPT session for nursing and medical students. The main body of data was obtained from the transcripts of debrief sessions. In addition, observations were carried out during the simulations. The observations were conducted by myself and one of my co-supervisors acting as "passive participants" (Polit & Beck, 2008; Yin, 2014).

Forty-eight students (26 medical students, 22 nursing students) participated in the training session. The nursing students were invited through a web-based student portal at university 2 - to participate voluntarily in the study as part of their clinical training. The medical students at university 1 were invited through their supervisor at the hospital; the IPT training session being included as an integral part of their clinical training. Given the option of voluntary participation in the research part of the training session, all students consented to participate.

The students were assigned to eight groups, each group consisting of 5-7 medical and nursing students. The nursing and medical students were in their third and fourth year, respectively. Prior to the simulation, participants were encouraged to read a booklet introducing them to IPT and the communication protocol SBAR.

Each group trained on two simulation scenarios, internal bleeding (S1) and huddle (S2). A facilitator, either a physician or a nurse, supervised each group. The debrief data were audiotaped and transcribed. The observational field notes were transcribed and analyzed with the debrief data.

3.5 Data analysis

This study is inductive in the sense that the concepts used are primarily grounded in the data. This principle is essential in avoiding the bias that comes with choosing one set of established concepts (Glaser & Strauss, 1967).

The analytical process relies on content analysis (Graneheim & Lundman, 2004). Content analysis builds on many of the same principles as grounded theory (Glaser and Strauss, 1967). However, some adherents of grounded theory, perhaps as a consequence of the extensive debate in the wake of the original work, may have cast the theory in a too orthodox form that tend to limit the analysis (Hammersley & Atkinson, 2007). Hence, to avoid being constrained by a restrictive analytical framework, I chosen to utilize the more open formalism of content analysis elaborated by Graneheim and Lundman (2004).

Content analysis has been adopted in qualitative studies where its main function has been described as deriving empirical categories (Graneheim & Lundman, 2004). Beyond fashioning a categorical description, content analysis also aims at exposing *themes* relating and reaching across categories; while the categories describe what appears manifestly, the themes operate at a latent level, addressing how a set of phenomena relates and constitutes a system (Graneheim & Lundman, 2004). It follows that the themes require interpretative efforts to be exposed, a position that resonates with the interpretivism adopted in this study. In order to grasp the complexity of IPT training, the hierarchy of themes and categories was supplemented with sub-themes and sub-categories (Graneheim & Lundman, 2004).

The extraction and description of themes provide the building blocks for developing theories. The latter has been extensively discussed in a grounded theory setting (Glaser 1998; Glaser & Strauss, 1967; Hammersley & Atkinson, 2007; Yin, 2014). Many of the points developed are arguably valid in a content analysis setting, for example, the fashioning of hypotheses, whose credibility can be assessed as the analysis proceeds (Glaser, 1998).

3.5.1 Operationalizing the analytical process

In sub-study 1, the combined text material from the 32 study programs amounted to more than 500 pages. To conduct the analysis, the text was scanned

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for the word *interprofessional*. Narratives containing that word were coded and analyzed according to the steps of content analysis. The free-text responses to the e-mail based questions were coded in a similar manner.

In sub-studies 2, 3, and 4, content analysis was applied at both a manifest and a latent level, eliciting a range of categories and themes. To the extent possible, the categories were discussed and defined as a collective effort with my co-authors, thereby mitigating part of the bias caused by personal preferences (Graneheim & Lundman, 2004). Each sub-study resulted in a scientific article.

The analysis started immediately after finishing the data gathering (from interviews, debrief sessions, and observations). The researchers read their notes individually before meeting to produce an interim assessment of key notions. After receiving the transcribed text (in most cases produced by myself) – usually a few days later – the coding process started, producing a number of meaning units, later to be continually compared and organized in groups to unveil categories. The process was revisited at several stages.

As the category structure reached saturation, the analysis sought patterns of meaning stretching across the categories, i.e. *themes*. As an example, consider *clinical professionalism*, a theme that linked many categories. Analytical categories and themes were discussed with the co-authors at several stages.

3.6 Trustworthiness

The evaluation of trustworthiness has been discussed by many authors, including Lincoln and Guba (1985) whose treatment has been influential. The authors assert that a study is trustworthy if it can persuade the audiences – including the researchers performing the study – that the findings merit attention and consideration. The criteria for trustworthiness are linked to the concepts of *credibility*, *transferability*, *dependability* and *confirmability*.

It is worth mentioning that Lincoln and Guba (1985) highlighted case studies as conducive to trustworthiness, a position corroborated by Flyvebjerg (2006) who argued that case studies naturally lend themselves to trustworthiness – because of their ability to add depth to the analysis.

3.6.1 Credibility

According to Lincoln and Guba (1985), *credibility* is key to qualitative research and can be thought of as replacing *truth-value*, which has been used in more traditional scientific research. Strengthening credibility can be achieved by the activities that pertain mainly to data collection: *prolonged engagement*, *persistent and relevant* (“*salient*”) *observations*, and *triangulation*. In addition, the authors recommend improving credibility by *peer debriefs*, *negative case analysis* and *member checking*.

Working from an anthropological point of view, Lincoln and Guba (1985) linked *prolonged engagement* to the duration of the observational period. As this study is based on short interviews, it does not fit this requirement. However, a group of researchers (co-authors, facilitators and I) remained engaged in the study phases throughout four years, a longevity that promoted in-depth reflection and enhanced credibility.

The term *persistent observations* (“*salience*”) refers to an ability to focus on phenomena of significance (Lincoln & Guba, 1985). In this study, the use of semi-structured interview formats served to keep focus on key issues of IPT.

Triangulation implies studying the same phenomena by different means (Polit & Beck, 2008; Yin, 2014). Here, triangulation was achieved by applying different methods (e.g. interviews and observation), by variation of data sources and by involving different researchers.

Beyond data collection, other factors are expected to improve credibility, including *peer debrief*, during which several peers discuss the ongoing research activities. In the current study such debrief interactions and discussions were ubiquitous, particularly involving the co-authors of the different sub-studies.

Portrayed as an analogue to the rejection of hypotheses in quantitative methodology, *negative case analysis* is the critical process of modifying and possibly rejecting hypotheses as the ongoing analysis brings more insight (Lincoln & Guba, 1985). In this study, I hypothesized that conflict and debate would play a key part in IPT (Strauss, 1967). However, after data analysis this pre-conception had to be modified.

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Member checks is highlighted as a crucial pathway to credibility (Lincoln & Guba, 1985) and refers to the process of asking the participant groups to verify or comment on the results of the analysis (e.g. categories, themes, hypotheses). In this study, member checks were difficult to conduct because the analysis concluded long after the data collection, when many of the participants were no longer available. However, a group of staff involved in the study was asked to give feedback on the results at various phases, and especially during the publication process.

Another form of member checks, though somewhat premature, was embodied in the summary sessions following the interviews.

3.6.2 Transferability

The concept of *transferability* has been introduced to address the problem of conceptual generalizing. Lincoln and Guba (1985) pointed out that generalizing a case study is dubious and somewhat paradoxical, since a case by definition is particular. Yet, a well understood case may inform ensuing studies, depending on the similarity between them. In addition, case studies have been shown to contribute to theory expressed in abstract concepts (Eisenhardt, 1989). Lincoln and Guba (1985) stressed that transferability relies on knowledge of “*both the sending and the receiving context*” (p.297).

In this study, the development of general concepts and theoretical notions can be seen as conducive to transferability. Hypothetically, given that the features of the *sending and receiving* cases are sufficiently similar, the grounded nature of the conceptualization is likely to steer the analysis of the receiving case in the direction of similar categories and themes.

3.6.3 Dependability

Dependability refers to the stability and repeatability of the results, should the investigation be replicated under similar conditions. Lincoln and Guba (1985) proposed variants of triangulation, including stepwise replication involving parallel inquiry teams to strengthen dependability. The methods has obvious drawbacks with respect to the resources needed.

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In this study, a stepwise replication strategy was partly invoked in that parallel participant groups were subject to interviews and debrief discussion sessions. In addition, in the course of the sub-studies many of the same issues and themes reappeared. No diverging trends or systematic differences between groups were recognized, thereby strengthening the dependability of the study.

Another mechanism suggested to improve dependability, relies on a structured audit process, addressing both the process and the study results. In this study a form of audit function is embodied in the quality assurance imposed prior to the four publications.

3.6.4 Confirmability

Confirmability in qualitative research can be understood as replacing the more conventional requirement of objectivity (Lincoln & Guba, 1985). In qualitative studies, the emphasis is on the data, and a key question is whether the data set is confirmable. This has led to the requirement of data being “auditable.”

The confirmability of the data used here rests on the integrity of the data acquisition, which was conducted according to recognized methods, attempting to minimize bias and expose eventual manipulation. Every step was documented, and the results - and process - were subjected to peer reviews as an integral part of the publication and PhD processes. An audit track is available in the form of reports, notes and journals.

3.7 The researcher role

Reflexivity denotes an attitude to include the effect of the researcher’s preconceptions in knowledge construction. It starts by identifying preconceptions rooted in previous personal and professional experiences, beliefs, motivation and qualification, as well as perspectives and theoretical foundations (Malterud, 2001). In this thesis, I have made efforts to remain aware of my background as nurse, head nurse, supervisor for nursing students, member of the faculty of a nursing school, and coordinator for a nursing study program. I have considered the potential impact of my preconceptions,

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cognizant of Malterud's (2001) contention that preconceptions are not the same as bias, unless the researcher fails to mention them.

My professional background is highly relevant to this study. At the same time, my personal experience with IPT and nursing may have forged preconceptions that could contribute to blinders and limited horizons (Malterud, 2001). This concern was addressed by enlisting the support of a broad team. The co-authors, moderators and facilitators were professionals from different disciplines, including physicians, nurses, a psychologist, a sociologist, and a safety scientist.

3.8 Ethics

The study was approved by the Norwegian Social Sciences Data Services (No. 26329, 28383, 32881, 34416), university 1, university 2 and the university hospital involved in the study. Consent forms were signed by the medical and nursing students as well as the involved staff members. It was stressed that participation was voluntary, and that responses would be treated anonymously.

The Regional Committee for Medical and Health Research Ethics, Western Norway, exempted this PhD study from seeking approval since the research activities presented here did not involve patients, patient information or next-of-kin (appendix 4).

The current study was granted financial support by the Laerdal Foundation for Acute Medicine, a fund based on donations from Laerdal Medical AS, which is a company with commercial interests in simulation-based technology and equipment. The Laerdal Foundation did not interfere with the project during the study period.

3.9 Methodological reflections

Most evidence-based qualitative studies seek to confer a degree of rigor upon the results. Here, this was discussed with frequent references to the framework elaborated by Lincoln and Guba (1985). Although the authors regarded their work as "unfinished" and relying upon the acceptance of their "naturalistic paradigm," the notions provided by subsequent researchers (e.g. Reeves &

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Hean, 2013) have arguably not deviated much from the path laid down by Lincoln and Guba (1985).

The strengths and weaknesses of the methodology have been cover above. Yet, it is worthwhile to elaborate on a few methodological issues.

3.9.1 Methodological advantages

Database. Querying a broad range of stakeholders in a qualitative study, precipitated a rich and substantial database for the ensuing analysis. The database is auditable and “confirmable” by other researchers.

Longevity. Embracing four sub-studies, this study was conducted over several years. This allowed parallel analysis and data acquisition, which informed the purposive data sampling as the analysis proceeded. The longevity also promoted an in-depth understanding of the case under study, enhancing the credibility of the results.

Student perspectives. By inviting students to participate, the perceptions of an often-neglected user group was included. This broadened the study and added new perspectives.

Triangulation. This study exploited triangulation in connection with participant groups and methods. Multiple groups enabled stepwise replication, confirming the systematic nature – or dependability -- of the results.

Inductive approach. The inductive, grounded approach to the case study laid a solid foundation for a trustworthy and credible analysis. This is because the content analysis facilitated an in-depth understanding. In addition, being derived from data, grounded concepts are resistive to theoretical error and preconceptions, including the bias that comes with choosing a specific theory as starting point for the analysis.

3.9.2 Methodological disadvantages

Insufficient data sampling. In spite of the substantial database, the format of the short focus group interviews and debrief session may have failed to capture

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certain aspects of IPT. The potential existence of ongoing negotiations may be an example.

Preconceived notions. Preconceived notions represent a general problem, but are especially distressing in this study when they shape the understanding of roles and behavioral patterns, consolidating stereotype notions of nurses and physicians – as well as the relation between them. Not being able to neutralize stereotypic thinking and behavior may be a weakness of methodology.

Hawthorne effect. Known to influence study participants to respond overly positively due to the awareness of being observed (Parsons, 1974), the Hawthorne effect may have influenced nursing and medical students when attending the interviews and debriefing sessions. Follow-up meetings scheduled some time after the initial interviews/debrief sessions, might have mitigated the Hawthorne effect, but limited scope and resources did not allow for this.

Educational mandate. An educational mandate left its mark on certain parts of the project, most notably the IPT training and the ensuing debrief. Educational environments, flavored by motivation and encouragement, did not always fit the neutrality of research investigation. In the educational setting, the facilitators were apt to instruct the students in the “correct” way of performing a task, a process that may have influenced the students and enforced preconceptions, for example regarding role relations and communication.

Participants. The recruitment may have introduced a bias in attracting a certain segment of the eligible nursing and medical students, for example those with a certain surplus capacity or with an interest in research.

Rhetorical skills. Since the data collection rested mainly on dialogue and exchange - the process may have favored the vocal participants, especially those with rhetorical skills. This bias was acknowledged during data collection, and the moderators intervened if certain participants appeared to dominate the discussion.

4 Summary of results

This chapter summarizes the main findings of papers I-IV, and the relationship among them.

4.1 Study progress

Table 3 displays the timeframe of the study and summarizes its progress from 2011 to 2016.

	2011	2012	2013	2014	2015	2016
Main activity	Study design Ethical approval Literature reviews	Data collection Paper I - II Data analysis Papers I - II	Data collection Paper III - IV Data analysis Papers II - III Publication Visiting Scholar at UCSF	Data analysis Papers III - IV Publication and Reviews	Data analysis Paper IV Thesis synopsis Publication and Reviews	Thesis synopsis Publication
Results			Paper I: Current study programs	Paper II: Student perspectives	Paper III: Different professional perspectives	Paper IV: Student experiences Thesis submission
Research question - Ch. 1.2		No 1 and 2	No 3 and 4	No 5	No 6 and 7	

Table 3: Timeframe and progress of the PhD study

4.2 Paper I

Sub-study 1 aimed to identify the components of IPT included in nursing and medical curricula in Norway, and then to describe the commonalities and differences in IPT in the curricula of the institutions. This study identified the status of IPT in all the 28 nursing and 4 medical schools in Norway in 2012.

All 32 of the study programs had an introduction followed by chapters and course descriptions. Analysis of the introductions revealed that five of the 28 nursing programs and one of the four MD programs failed to mention IPT. In the course descriptions, all 32 programs referred to IPT. The textual units expressing such references were associated with either *lecturing* or *clinical training*. Both categories were identified in all of the study programs.

Contacted by email and telephone, the study coordinators were asked to what degree IPT had been introduced in lecturing and clinical training. The results indicated that the majority of the institutions – all medical programs and 25 of 28 nursing programs - had introduced IPT as a topic in lecturing at the theoretical level. Three of the four medical programs had integrated IPT into their clinical training. Implementation was less successful in the nursing programs, of which only four out of 28 had introduced IPT in their clinical training, suggesting a disparity between ambition and the ability to implement.

For the nursing programs, the challenges of clinical training appeared to be related to organizational issues (e.g. lack of institutional collaboration), practical difficulties (e.g. finding time to bring students of various professions together) and possibly managerial issues (e.g. lack of strategic perspective and change management capabilities).

4.3 Paper II

The aim of paper II was to describe nursing and medical students' perceptions of IPT, focusing on experiences and recommendations that can be utilized for guiding future IPT training efforts. Cognizant that students represent the users of clinical training, this study surmised that the students' perspectives constitute an important source of information for developing training.

Summary of results

The analysis identified two major themes that reverberated across the student groups. The first emphasized the impact of professional role behavior and was denominated *responsibility in professional roles*. The second theme discussed how different wards, organizations and occasions – i.e. arenas - were conducive to IPT. This theme was labeled *use of interprofessional arenas*.

The students' perceptions suggested that traditional patterns of professional roles prevailed in clinical work and training, influencing the professional understanding of responsibility. The medical students were inclined to individual behavior, assuming responsibility, while the nursing students perceived themselves as coordinators, who tended to share responsibility. The dominant role of the physicians could discourage nursing students from expressing their concerns. The data suggested that the medical and nursing students suffered from lack of knowledge of each other's competence and capabilities, and that this "knowledge gap" impaired collaboration across disciplinary boundaries.

The study exposed substantial variation in the students' perceptions of IPT arenas (e.g. ward rounds, psychiatric wards), reaching from arenas characterized by mutual respect and collaborative processes, to arenas characterized by hierarchical structures, distrust and lack of communication, leading to marginalization of staff, particularly nurses who reported feeling invisible.

Psychiatric wards were notably seen as ahead of other arenas when it came to mutual respect and IPT. The study reported in paper II was not designed to map out a more detailed description of the favorable perception of psychiatric wards among the students.

Asked to propose an arena that could serve as model for future training courses, several students pointed at the daily rounds or the huddle in a clinical ward. According to the students, the huddle allowed at least a minimum of IPT discussion. The daily round was highlighted as one of the few arenas where the patients could discuss with representatives of the professional staff such as physicians and nurses.

4.4 Paper III

The aim of paper III was to explore the perspectives of relevant stakeholder groups with regard to the content of IPT in the education of nursing and medical students. The research aspired to expand and deepen the knowledge base underpinning the design and implementation of IPT and IPT training, and as part of this to develop a set of instrumental notions for optimizing the design of future training efforts.

The findings revealed positive attitudes amongst stakeholders towards IPT training, but also concerns about how communication, collaboration and workflow, as well as professional role patterns should be treated in such training. The concerns were augmented by the power relationship between the nurses and the physicians, a relation that was found to be manifestly asymmetric, reinforcing the dominant role of the physicians. The physicians' command of language and professional dialogue were found to deter the nurses from expressing their concerns.

The analysis suggested three themes -- or perspectives -- of IPT that should be considered when designing training efforts: clinical professionalism, team performance and patient-centered perspective.

With a certain affinity to a mechanistic view of the patient, *clinical professionalism* embraces the technical knowledge and skills needed to repair a part of the patient's body, such as an organ. This perspective tended to be emphasized by the physicians and medical students, but also the nurses and the nursing students acknowledged the priority of clinical professionalism, especially in conjunction with life-threatening emergencies. The perspective was seen as promoting an authoritative work and communication style, unimpressed by debates and democratic decision making, but founded on the superior clinical knowledge of physicians.

While clinical professionalism was seen as necessary and potentially lifesaving, it was also pointed out that this perspective is a poor starting point for resolving conflicts and disagreement, developing team identity, discussing non-technical issues, and adjusting the team's workflows and procedures. Such efforts were perceived as requiring a broader dialogue and collaboration, which was conceptualized by the theme called *team performance*.

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The theme of *patient-centered perspective* is closely affiliated with some of the key care (nursing) concepts, and involves understanding the patient from a subjective (first-person) point of view, and not purely through sociological, medical and statistical notions. Although the patient-centered perspective surfaced in different contexts, it was far from being a ubiquitous or dominant issue. The observation that the perspective was rarely mentioned was more striking than the occasional reference to the patient's perspective. This forced a discussion from a theoretical and critical viewpoint, rather than relying on the purely grounded and inductive procedure.

Our analysis suggests that in order to optimize future interprofessional training, the three perspectives should be highlighted and balanced contingent on the students' background and the learning objectives.

4.5 Paper IV

The aim of paper IV was to explore and describe nursing and medical students' perceptions of interprofessional communication, in order to improve the design of future training efforts. As part of this, the study addressed the students' experiences with the introduction of the standardized communication tool SBAR.

Based on data obtained in simulation-based training sessions, the results identified two characteristic themes of interprofessional communication among nursing and medical students; *clinical exchange* (precise clinical information, measured parameters, test results etc.), and *collaborative exchange* (team dialogue, cross-disciplinary knowledge, professional boundaries etc.). Clinical exchange designated a communication style that aspires to be objective and to convey clinical information in technical language relying on terms with formalized definitions. The clinical exchange emphasizes unambiguous observations suited for medical treatment.

The theme *collaborative exchange* was defined to capture less formal exchange, including dialogue pertaining to team performance, cross-disciplinary questions, workflow adjustment and disagreements. The patient perspective seemed less manifest in this part of the study.

Summary of results

The use of a standardized communication tool (SBAR) in the training session appeared to be closely linked to *clinical exchange*, and not so much to *collaborative exchange*. According to some students, this may have been due to insufficient training. The results suggest that efforts to improve the design and implementation of simulation-based training sessions should explore pathways to: (a) balancing clinical exchange and collaborative exchange, (b) considering the introduction of a communication style embracing patient-centered exchange, and (c) contextualizing standardized communication tools such as SBAR, by offering improved training and procedures that are grounded in the situation at hand.

4.6 Relationship between the papers

The four papers and the corresponding sub-studies together constitute a research project that aims at establishing a knowledge base and a conceptual framework for design of future IPT training of nursing and medical students in Norway. Grounded in the perspectives of the key stakeholders, the knowledge base is concerned with fundamental principles, rather than detailed didactic procedures.

The first paper mapped out the components of IPT in the education of medical and nursing students in Norway. The results – especially within the nursing students’ clinical training – inspired paper II to probe the perspectives of the students that were considered to represent the “users” of the education and hence critical stakeholders. The results of paper II revealed that responsibility and professional roles were key notions. The focus on the professional staff seemed to overshadow the primacy of the patient; an important result that was factored into sub-studies 3 and 4. Moreover, the result elaborated in paper II suggested that the daily rounds and corresponding huddle meetings offered a suitable arena for IPT training, a result that was followed up in paper IV.

Paper II revealed some key notions of interest for the design of IPT training, but did not supply a deeper understanding in the form of a conceptual framework. To accomplish this, paper III acquired data from a broader range of stakeholders, accumulating a richer base of ideas from multiple vantage points. This allowed the introduction of the three themes or perspectives that

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span the conceptual framework: clinical professionalism, team performance and patient-centered perspective.

Paper IV was based on data obtained from the simulation-based IPT training, particularly from the debrief sessions. The idea was to consolidate the conceptual framework and findings of paper III. Exploiting debrief data, paper IV used a different methodology from paper III, which was based on focus group interviews and observations. The shift in methodology – representing a form of triangulation – is believed to strengthen the credibility of the results.

In response to a more tangible question, the use of SBAR was tested in sub-study 4, and subsequently discussed in light of the conceptual framework presented by paper III.

5 Discussion

This thesis aims at contributing to a broad knowledge base for designing and implementing IPT training for medical and nursing students in the Norwegian context. Relevant theoretical approaches have been discussed above. In this chapter, I will discuss some of the major issues covered in the thesis, supported by theoretical reflections.

5.1 Student perspective

An ambition of this study was to collect data from a broad range of stakeholders. In this regard, the students constitute a group of special interest. Firstly, the students are considering the issues of IPT with fresh eyes, as compared with the professional staff. The students are perhaps freer to challenge educational perspectives, having no or little interest linked to the established formats. Brooman et al. (2015) and Carey (2013) pinpointed students as important co-designers of higher education curricula. Secondly, the students may be perceived as the most critical user group; if an IPT training session fails to resonate with the students, the educational institution will eventually have to reconsider the training format.

The *knowledge gap* –the lack of insight into each other’s disciplinary capabilities and competence – emerged in papers II and IV. The knowledge gap is obviously an obstacle to building trust, to delegating tasks and to establishing team identity amongst the nursing and medical students. One would think that the educational institutions - with capacity for providing the missing knowledge – would attempt to resolve the problems. However, one may hypothesize that the knowledge gap as described here is a simplification; from a sociological perspective, the “gap” should be addressed in light of role patterns and structural determinants such as educational programs and organizational support. Further research is needed to explore the knowledge gap, and subsequently propose measures for mitigation.

5.2 Different IPT conceptualizations

The data analysis revealed almost exclusively positive statements regarding the merits of IPT. Without any in-depth reflection, none of the study participants questioned if the time and efforts spent on IPT in general, and on the simulation-based training session in particular, could be justified. However, such a positive attitude should be accepted only with caution, and could easily be a result of the Hawthorne effect or other types of response biases originating from the study set-up, including the opinions and beliefs of the professional staff (instructors, facilitators, and teachers). The latter will of course be accentuated in an education setting, where instructing – and hence influencing – the students plays a major role.

Another observation was that the discussion of IPT referred to different arenas and levels of abstraction – that were somewhat intertwined:

- IPT taking place in hospital wards.
- IPT as a learning objective in an educational setting.
- IPT as a method for learning together, across professions.
- IPT as a method for learning IPT in healthcare teams.

The latter perspective is echoing a principle reiterated by researchers working within IPE; working in teams can only be learned by learning in teams (Thistlethwaite, 2012; Thistlethwaite et al., 2015), a view that is resonant with the results of the current study.

The different understandings of IPT add variation and complexity to the topic. In this thesis, all comments on - and conceptualizations of - IPT have been integrated, regardless of the different arenas and levels of abstraction. Such an integrative approach has in this case been useful, especially since the study's focus is not on the details of learning situations, but on the fundamental properties of IPT, likely to reverberate across all the conceptualizations.

5.3 Training development in healthcare education

The influential review of Salas et al.(2012) devoted to training development in organizations, is relevant to this study (see also Ch. 2.2.2). The authors

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suggested a Training Needs Analysis (TNA) be conducted as basis for designing training.

Developing and implementing IPT training sessions for medical and nursing students can likely capitalize on the work of Salas et al. (2012), using the analysis as a checklist for what to do before, during and after training. However, a major drawback with the formalism is arguably that it fails to recognize the specific character of the healthcare environment, including the presence of the patient and the impact of powerful professional roles, as well as the fact that disagreement and negotiations may have to be dealt with. It may even be difficult to reach consensus on the objectives of teamwork training. These distinct factors should be reflected in the “before training” preparations.

Salas et al. (2012) are assertive about IPT training demanding two-dimensional thinking; it is necessary to train them to perform different clinical tasks, but it is also necessary to train on working in teams. The results of this study suggest a third dimension: the patient-centered perspective that should be infused at all levels of a before-training needs analysis; strategic, organizational and individual. Moreover, the knowledge gap (ch. 5.1) must be considered in the TNA.

The framework offered by Salas et al. (2012) is likely to raise some general questions. Firstly, despite being hailed as highly significant, formal training stands for only a fraction of a person’s knowledge base. Furthermore, the erosion of knowledge after training is described as a serious concern. Both of these assertions seem to question the long-term impact of formal training. Second, the organizations and teams canvassed by Salas et al. (2012) seem unaffected by conflicts or role patterns. Apparently, no change processes are taking place. This is hardly in accordance with research on the culture and performance of healthcare groups (Strauss, 1978). It is tempting to speculate that this optimistic picture may be linked to neglecting the social and sociological perspectives of IPT.

5.4 A conceptual framework for IPT training

Paper III exposed three perspectives through which interprofessional team members perceive collaborative efforts (clinical professionalism, team performance, patient-centered perspective). While the perspectives of clinical

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professionalism and team performance are firmly grounded in the data and emerged through inductive content analysis, the patient-centered perspective did not appear frequently in the data. In fact, the patient as a person was conspicuously absent most of the time. These “negative” observations – termed the “vanishing patient” -- were unexpected and hard to reconcile with the core values of patient care such as patient involvement and patient-centered care (Coulter, 2011; McCormack & McCance, 2010).

From a theoretical point of view, however, there are compelling arguments that the patient’s role and perspectives are necessary components of successful IPT and hence IPT training (e.g. Reeves et al., 2010; Coulter, 2011). Cognizant of the insufficient data at this point, to complement the grounded inductive conceptualizing the analysis introduces a theoretically based element: the theory of patient-centered care (Coulter, 2011; McCormack & McCance, 2010).

A thorough understanding of the patient-centered perspective may arguably require personal maturation for the students to experience identification with the patient at a sufficiently deep level allowing them to step into the *Lebenswelt* of the patient. The nature of the patient centered perspective therefore sets it aside from the two other perspectives, and the challenge with grasping it may have been difficult for the study participants to deal with during interviews and the simulation-based training session.

In a pragmatic sense, the three perspectives and their interplay constitute what can be referred to as a conceptual framework for IPT training. To illustrate, the perspectives can be arranged in the corners of a ternary diagram (Fig. 2) with properties as discussed below.

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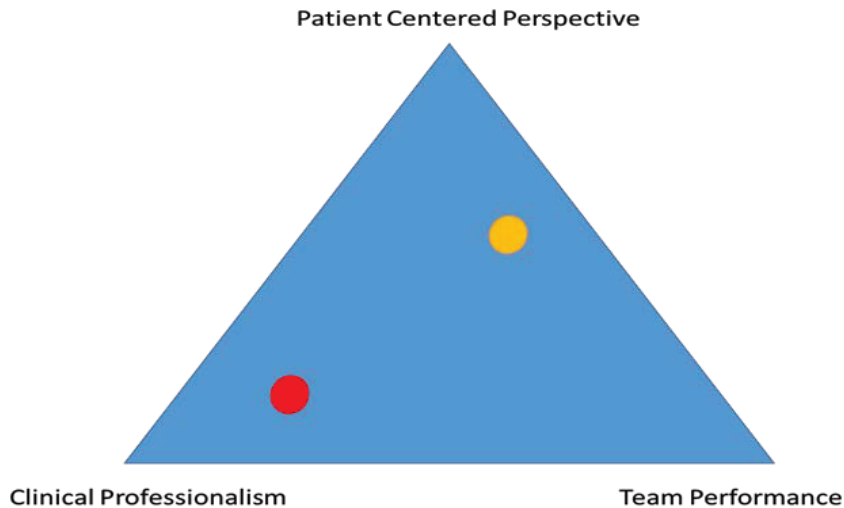


Figure 2: A conceptual framework for IPT training

A point added to the diagram can be used to illustrate representative “values” (i.e. prioritization) of the three perspectives. The closer the point is located to a corner, the higher the “value” of the perspective associated with that corner. The corner point in itself represent a maximum “value” for the corresponding perspective while the two remaining perspectives have their minimum value at this point. Even if this study is qualitative, the ternary plot can serve as a tool for discussion, planning and design of IPT training, provided a few assumptions are made. Let us assume that – in conjunction with an IPT training session – we consider the three perspectives as learning variables, and that it is possible to put more or less weight on each of the three variables. Let us also stipulate that there is a fixed amount of time and resources available, and that increasing the emphasis on one perspective, must be compensated by reducing the weight on one or both of the two other perspectives.

Consider, for example, designing an IPT session built around a scenario involving a complex surgical procedure. It is decided to put more emphasis on clinical professionalism at the cost of reducing the time spent on team performance and patient-centered perspective issues. Moreover, it assumed that the increase in effort spent on clinical professionalism, should be compensated by equally reducing the weight of the two other perspectives. The weights of

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the perspectives can then be illustrated by the red circle added to the ternary diagram in figure 2. Note, the proximity to the lower left corner, the point where the weight on clinical professionalism is at a maximum.

As a second example, consider an IPT training design for a palliative ward. It is decided to allocate a great deal of the time to the patient-centered perspective. Moreover, one will put less weight on team performance, and only a minimum weight on clinical professionalism. This prioritization strategy can be illustrated by the yellow circle in figure 2.

The examples show that the ternary diagram can be used for planning and discussing IPT training in the design phase and in the debriefing that follows the training. In the design phase the weight on each perspective may be adjusted contingent on the students' background and according to the learning goals of the IPT training.

Paper IV yielded results that were consistent with the conceptual framework displayed in figure 2. Observing and analyzing students' interprofessional communication in debrief sessions precipitated *clinical exchange* and *collaborative exchange* as the main communication categories. In spite of little data, a third category named patient-centered exchange was introduced to cater for the patient-centered perspective in communication. These categories, distilled in Paper IV, fit the conceptual framework in figure 2.

Clinical exchange, collaborative exchange, and patient-centered exchange, correspond to clinical professionalism, team performance, and patient-centered perspective, respectively.

The three-dimensional conceptual framework can be used to illustrate and discuss the use of SBAR. One may hypothesize that while SBAR might fit the instructional and precise communication needed for clinical professionalism, it may be too limited and inflexible to deal with team performance and the patient-centered perspective. The latter perspectives are linked to communication that involves less tangible aspects and non-technical processes.

5.5 Additional reflections

Inspired by the sociological negotiation order theory of Strauss et al. (1963) and Strauss (1978) it was expected – in the initial phases of this study – to find evidence of conflict, disagreement and ongoing negotiations between the professional groups. Following Strauss, it is reasonable to assume that these putative negotiations play a role in balancing the relative weights of the IPT perspectives. Consider an example where the nurses’ advocacy for teamwork and patient-centered perspective is balanced against the physicians’ focus on clinical professionalism. The resulting balanced position would depend on the outcome of the negotiations.

However, such assumptions were not confirmed in this study. Only limited observations of exchange akin to negotiations were made, and the data failed to corroborate a picture of ongoing negotiation and conflict across team members and/or professions. The format of the interviews might not be ideal for illuminating these issues, since the Hawthorne effect, as well as the attitudes of the group supervisors and their educational mandate, were suggestive of a positive collaboration and mutual respect far from conflict and disagreement. For the same reasons, the simulation-based format might fail to capture the conflicts and negotiations of the workplace. This argument, however, does not explain why past experiences (for example student practice or job assignments) of the participants reportedly had little or no evidence of negotiation. In addition, the observations of IPT practice discussed in paper III and paper IV failed to identify any substantial signs of conflict and negotiation.

Rather than ongoing negotiations, the dynamics of the healthcare teams accounted for in this study were governed by powerful professional role behavior, amplified by lack of mutual knowledge of each other’s capabilities, i.e. the knowledge gap. The role of the physicians – seemingly adopted by the medical students – tended to be dominant, “forcing” the teamwork to focus on clinical professionalism. The nurses and nursing students appeared in many cases to accept as a necessity - or a natural arrangement – the dominant role of the physician, to the degree that they refrained from voicing their opinions, a pattern of behavior that does not fit the negotiation order theory’s description of active and verbal negotiations between professionals. Moreover, the nurses’

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inactive behavior might be prone to risk and can potentially lead to “silent kills” situations (Maxfield et al., 2011, Sayre et al., 2012).

One may hypothesize that the asymmetric role relationship may have materialized through negotiations that have persevered over time. Today’s situation with the physicians’ - and medical students’ - dominant position may require very little negotiation to maintain, negotiations that may occur undetected, or that may even rely on unconscious processes.

A striking feature of the data is the “elusive” or “vanishing” patient, where the interests and perspectives of powerful professional groups eclipse those of the patients. Rooted in a psychodynamic tradition, Menzies-Lyth (1970) theorized that healthcare groups under stress and pressure diverted their energy and attention from caring for the patient to maintaining team functions. The authors emphasized that the process was driven by unconscious factors, and not deliberately engineered by the team members.

The above theoretical approach suggests a scenario of interest for the current study. Firstly, that IPT introduces complex workflows that can easily be experienced as stressing. Secondly, that situations with emphasis on clinical professionalism may impair the maintenance of team performance factors – such as common goals and team identity. Thirdly, that team members are impelled to direct their attention towards the faltering team performance at the expense of the patient-centered perspective. This suggests that the theory of Menzies-Lyth (1970) is still relevant and may constitute a vantage point for new research on the role of the patient in IPT training.

5.6 Implications

Exploiting the four domains for understanding IPT suggested by Reeves et al. (2010b), this section discusses potential implications of the results of this study. The implications will be related to the relational, processual, organizational and contextual factors. To achieve improvement in IPT training, measures may be needed in more than one domain. This is in accordance with the recommendations by Salas et al. (2012), stating that in order to maximize the value of training, measures ranging from the strategic to the individual level should be considered.

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This thesis describes the elusive patient, whose perspectives tend to be eclipsed by the powerful dynamics between the professional groups. At an abstract level, this study promotes the implementation of measures that invigorate the patient-centered perspective in IPT and IPT training. This is consistent with the growing body of literature on patient-centered care (e.g. Coulter, 2011).

In addition, a key result of this study shows that clinical professionalism should be weighed against the dimensions of team performance and the patient-centered perspective. Measures to improve IPT training must strive to achieve the best balance suitable for the learning objectives of different training efforts, and be particularly aware of the difficulties that comes with allowing clinical professionalism to dominate the other perspectives.

5.6.1 Relational factors

Based on this thesis, micro-level relations in IPT are still heavily influenced by a hierarchical relation between physicians and nurses. A similar hierarchy prevails between medical and nursing students, arguably causing a number of obstacles to interprofessional communication and IPT. The hierarchical stereotype has been linked to professional socialization leading to a closed professional identity with its own behavior, language, values and attitudes, which can mean that engagement in interprofessional collaboration is regarded a low priority (Reeves et al., 2010b).

Based on the conceptual framework (fig. 2) one may hypothesize that the dominance of the medical students is linked to their practice of clinical professionalism. Once this perspective becomes the principal way of understanding IPT and IPT training, it provides a strong impetus for the medical students to take a leading role with the consequence that teamwork and patient-centered perspectives – closer to the nursing core competence – may be downplayed. Over-stressing the clinical professionalism perspective may even lead to marginalization of nursing students during IPT training.

In terms of communication, nursing students may as a result of the above, assume a passive role, even with regard to issues where they might be in the best position to provide the insight needed for IPT and IPT training. Communication protocols like SBAR may force the nursing students to

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participate in the exchange of communication. However, such protocols may also limit the free flow of information. The pros and cons of SBAR should be carefully explained and understood by the student to preserve the balance between restrained and free-flowing communication.

Mitigation of IPT hindrances at the micro level may be based on repeated training and education. Awareness of the dimensions of teamwork may stimulate a broader and richer interprofessional collaboration. Knowledge of the function of negotiation – including the fact that avoiding discussions may serve to entrench existing role relations – can possibly help health professionals to embrace a work style that is more open to debate and changes. Invigorating the patient role is likely to call attention to the risk factors experienced by the patient.

At micro level, the knowledge gap is likely a major obstacle to building trust and teamwork culture. In order to close the gap, educational efforts, including lectures, seminars and team training, should be undertaken to ensure that the medical and nursing students appropriate the necessary knowledge.

If the IPT training is simulation-based, the concept of fidelity warrants consideration. A simulation with sufficient fidelity imbues the participants with a sense of dealing with the “real thing.” At the micro level this may infuse the same emotional stress as in a real work situation. A high degree of fidelity may be desirable (Sharma et al., 2011), but may also have a flipside; the simulation might capture less desirable aspects of the situation, such as the marginalization of nurses. In such cases a concerted design -- as well as guidance by the facilitators -- may be needed to prevent the simulation from reinforcing adverse patterns of behavior, such as dominating physicians and tacit compliance by nurses. An alternative strategy could be based on emulating a more ideal situation, e.g. how the role relations “ought-to” be, advocating that the improved scenario will persuade the students to adapt a better work pattern.

5.6.2 Processual factors

This study suggests that IPT training sessions must be supported by procedures and processual frameworks that are broad enough to accommodate the dimensions of clinical professionalism, team performance and patient-centered

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perspective. If team performance is expected to be an important learning outcome, the IPT training sessions may involve team meetings and negotiation sessions. Correspondingly, some participants may be instructed to help represent the patient, when the patient-centered perspective has been defined as a major learning outcome.

The timing of the training events must be considered. Work tasks that require more discussion and that might transgress standard work tasks may stretch the time needed. The not-so-uncommon experience of lack of time may be mitigated by preparations prior to the IPT training session. In this study submitting written material to the participants, prior to the event, was perceived as useful (paper IV). On the day of training there should be a recap, ensuring that everyone have a reasonable understanding of what should happen.

Reeves et al. (2010b) contend that ambiguous role understandings can introduce friction between team members. At least, this study suggests that disagreement and frustration were sometimes caused by unclear workflow descriptions. It is, however, not obvious that this could be attributed to the understanding of roles. In any case, the point here is that very common workflows may not be understood unequivocally; an example being the confusion over how to obtain and manage the clinical parameters, which were subject to discussion in paper III and paper IV. This indicates that routine tasks may warrant a more prominent place in IPT training.

Ideally, all predictable and routine tasks that are included in IPT training should be clearly described and understood by students and facilitators. Standardized simulation scenarios and material may expedite the training; checklists and templates customized for the training may focus the exercise. Such learning material should be developed and improved as the training experience grows.

If the IPT training is simulation-based, the difference between the real workplace and the often idealized simulation exercise should be considered. The impact of role behavior may be different in a simulation from in the real workplace, where adverse role behavior may have been fortified by social factors. At the level of process, the students should be aware of social fidelity.

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5.6.3 Organizational factors

At the organizational level, the delivery of IPT training faces several challenges. There seems to be consensus that IPT should be learned in teams and not only through theoretical lecturing. Moreover, the resources – including budgets - needed for training should be realistic. To provide a stable academic foundation, the IPT training contents need anchoring in curricula pertaining to both lecturing and clinical practice.

In organizing IPT training sessions, and developing corresponding curricula, the results suggest the engagement of a broad range of stakeholders – including students. The students' voices are particularly important; a program that fails to engage the students may be hard to implement.

Based on paper I, planning for IPT training sessions may face organizational difficulties. Most of the nursing schools are not geographically co-located with a university offering a medical program. For once, this may necessitate travel. In addition, the number of nursing schools – 28 versus the four medical schools - exacerbates the problem. There are simply not enough medical students.

Alleviating this problem requires new thinking, perhaps utilizing technology allowing sessions where the participants do not need to be physically present. It may be possible to replace the medical students with teachers or fellow students. Alternatively, actors with special training may be engaged to play medical students or physicians.

The current study suggests that the facilitators of IPT training session should be familiar with major aspects of IPT, including the three perspectives: clinical professionalism, team performance and patient-centered perspective. If this requirement stretches the competence of the facilitators, teams of facilitators working together should be considered.

On order for the nursing teachers to act as role models for the students, it was suggested to encourage them to spend more work-hours with the students, particularly during clinical training.

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5.6.4 Contextual factors

There is a need to assess the cost-effectiveness of IPT training in healthcare, as suggested by the government in a white paper (St. M. 13, 2011-2012). Such assessments may guide decision makers, and help determine the desirable level of training.

With patient safety and quality of care still causing grave concern, national policies are needed to set standards, common guidelines and curricula for IPT training, and to facilitate collaboration among educational institutions. Such collaboration is also needed to resolve many of the issues mentioned above, such as the lack of medical students. Given the fragmented structure and the numerous and dispersed institutions – especially nursing schools – technology and development programs should be established at a national level.

6 Conclusion

IPT training as part of clinical practice for nursing and medical students is still being introduced into the Norwegian educational system. Based on stakeholders' perspectives, this thesis has contributed to expanding and deepening the knowledge base underpinning IPT and IPT training. The students' perceptions were of particular interest, and revealed the existence of a mutual knowledge gap among nursing and medical students. A conceptual framework consisting of three dimensions - clinical professionalism, team performance, and patient-centered perspective - has been developed, and may serve as a tool for planning and designing IPT training. A pilot IPT session provided insight into communication processes and reiterated the need for the patient-centered perspective.

6.1 Research questions revisited

Below, the conclusions are summarized under the headings of the research questions that guided the PhD-work.

What are the commonalities and differences in the IPT contents adopted in the curricula of the educational institutions?

Implementing IPT in efficacious educational programs has proven difficult, just as forming resilient IPTs in health care is reportedly non-trivial. Encouraged by government policies, the Norwegian medical and nursing schools had all adopted the objective of providing IPT training. The curricula of the institutions were similarly structured with two components: theoretical lecturing and clinical practice. In terms of clinical practice, medical schools were ahead of nursing schools in implementing IPT training (paper I).

How are the components of IPT embedded in nursing and medical curricula in Norway?

While most of the schools – medical and nursing – had introduced IPT as a topic in theoretical lecturing, three nursing schools had yet to do so. In clinical practice, the uptake of IPT training was slower: One of the medical schools, and 25 of the nursing schools offered no IPT training. Hence, in clinical practice

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there was a gap between ambition and achievement when it came to IPT training (paper I).

What are students' perceptions of their professional roles in the context of IPT?

A mutual knowledge gap was found to exist between the medical students and the nursing students, meaning the medical student had incomplete knowledge of the capabilities of the nursing students, and *visa versa*. The knowledge gap was perceived as an obstacle to IPT. Traditional patterns of professional roles prevailed in IPT, influencing the professional understanding of responsibility. The medical students were inclined to individual behavior, assuming responsibility, while the nursing students perceived themselves as coordinators inclined to share responsibility (paper II).

How do students perceive IPT arenas?

There was substantial variation in the students' perceptions of IPT arenas (e.g. ward rounds, psychiatric wards), reaching from arenas characterized by good collaborative processes, to arenas characterized by hierarchical structures, distrust and lack of communication, leading to marginalization of staff members, particularly nurses. Psychiatric wards were notably highlighted as arenas favorable to collaboration and IPT. The students suggested arenas that would allow interprofessional dialogue be serving as basis for IPT training, including the huddle meetings and daily rounds, both of which are arenas for mostly non-urgent work processes (paper II).

How do the relevant stakeholder groups perceive the contents of IPT in the education of nursing and medical students?

Students and other stakeholders largely perceived IPT and IPT training favorably (papers II-IV). However, there has been no long-term monitoring of the stakeholders' attitudes. IPT was perceived as heavily influenced by professional role patterns, with the medical students and physicians occupying dominant roles, patterns that replicated themselves during the simulation-based IPT training.

Conclusion

The perceptions of IPT and IPT training exposed three themes or perspectives through which issues pertaining to IPT training were addressed: *clinical professionalism*, *teamwork performance* and *patient-centered perspective*. Together the three perspectives constitute a conceptual framework providing a structure for understanding the broad range of phenomena associated with IPT training. To optimize IPT training, the weight assigned to each perspective must be balanced according to the learning objectives. The PhD results furthermore concluded that the patient and the role of the patient were conspicuously under-represented. A potential explanation is that the professional roles serve to marginalize the role of the patient (paper III).

What characterizes interprofessional communication among nursing and medical students in a simulation-based training session and how do students describe it?

The analysis identified two characteristic communication types: *clinical exchange* and *collaborative exchange*. It was hypothesized that optimizing the IPT training improvements may also require a third communication type: *patient-centered exchange*. Moreover, the IPT communication was reflecting professional role patterns. Physicians and medical students were perceived as favoring clinical exchange, and consequently to de-emphasize the need for collaborative and patient-centered exchange (paper IV).

How do nursing and medical students perceive the use of SBAR in a simulation-based training session?

The introduction of the communication protocol SBAR in the simulation-based training session proved only partly successful and required customization to the simulation scenarios. The streamlining of communication as in SBAR appeared to function best for clinical exchange. Therefore, there is a risk that imposing the SBAR structure may in some cases unduly restrain communication (paper IV).

6.2 Future research

Further studies are recommended to increase the knowledge of IPT training in health education. Based on the results of this thesis, the following areas are suggested for future research:

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- Assessing the quality of the IPT training offered by the medical and nursing schools in Norway.
- Describing the attributes of the psychiatric ward culture that favor IPT, investigating whether these qualities can be exploited in other clinical or educational settings.
- Studying and implementing interprofessional teams of facilitators in simulation-based training efforts.
- Studying the short and long-term benefits of regular IPT training throughout pre-graduate health education.
- Testing and implementing training sessions with a balanced focus on patient-centered perspective, team performance and clinical professionalism.
- Exploring the knowledge gap between nursing and medical students in order to propose mitigations.
- Conducting research devoted to the role of the patient in IPT training using the psychodynamic tradition as a vantage point.

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PART 2

List of Papers

Paper I

Aase, I., Aase, K., & Dieckmann, P. (2013). Teaching IPT in medical and nursing education in Norway: A content analysis. *Journal of Interprofessional Care*, 27: 238-245.

Paper II

Aase, I., Hansen, B.S., & Aase, K. (2014). Norwegian nursing and medical students' perception of IPT: A qualitative study. *BMC Medical Education* 14, 170-179.

Paper III

Aase, I., Hansen, B.S., Aase, K., & Reeves, S. (2015). Interprofessional training for nursing and medical students in Norway: Exploring different professional perspectives. *Journal of Interprofessional Care* 30(1):109-115, DOI: 10.3109/13561820.2015.1054478.

Paper IV

Aase, I., Bjørshol, C., Dieckmann, P., Aase, K. & Hansen, B.S. (2016). Interprofessional communication in a simulation-based team training session in healthcare: A student perspective. *Journal of Nursing Education and Practice*, 6 (7), p.91-100, DOI: 10.5430/jnep.v6n7p91

Paper I

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Paper II

RESEARCH ARTICLE

Open Access

Norwegian nursing and medical students' perception of interprofessional teamwork: a qualitative study

Ingunn Aase^{1*}, Britt Sæthre Hansen² and Karina Aase¹

Abstract

Background: Little is known about the ways in which nursing and medical students perceive and understand their roles in interprofessional teamwork. A 2010 report by the World Health Organization highlights the importance of students' understanding of teamwork in healthcare, and their ability to be effective team players. This study aims at describing nursing and medical students' perceptions of interprofessional teamwork, focusing on experiences and recommendations that can be used to guide future educational efforts.

Methods: The study uses a qualitative research design. Data were collected from four focus group interviews: two homogenous groups (one with medical students, one with nursing students) and two mixed groups (medical and nursing students).

Results: The results show that traditional patterns of professional role perception still prevail and strongly influence students' professional attitudes about taking responsibility and sharing responsibility across disciplinary and professional boundaries. It was found that many students had experienced group cultures detrimental to team work. Focusing on clinical training, the study found a substantial variation in perception with regard to the different arenas for interprofessional teamwork, ranging from arenas with collaborative learning to arenas characterized by distrust, confrontation, disrespect and hierarchical structure.

Conclusions: This study underlines the importance of a stronger focus on interprofessional teamwork in health care education, particularly in clinical training. The study results suggest that the daily rounds and pre-visit "huddles," or alternatively psychiatric wards, offer arenas suitable for interprofessional training, in keeping with the students' assessments and criteria proposed in previous studies.

Keywords: Interprofessional teamwork, Interprofessional education, Professional role, Content analysis, Healthcare, Students' perceptions

Background

Interprofessional teamwork in healthcare has gained increasing recognition worldwide as a way to increase patient safety [1] and to foster collaborative and effective teams e.g., [2,3]. The World Health Organization (WHO) has highlighted the importance of interprofessional teamwork and recommended educational programs that equip health care students with the necessary skills and competence to become effective team players [1,4].

International research [5-7] corroborates the position taken by the WHO, but studies also reveal difficulties in implementing interprofessional educational efforts [2,3,5,8] and suggest that undergraduate education largely fails to address key elements, such as the understanding of professional roles, authority, hierarchy and gender related dimensions of teamwork [1,2,7,9].

Of interest for the current study is the fact that Norwegian authorities have taken steps to promote interprofessional teamwork and education. The National Health Plan [10] acknowledges interprofessional collaboration as a critical element for ensuring quality in health care services. In a White Paper submitted to the Norwegian Parliament [11],

* Correspondence: ingunn.aase@uis.no

¹Department of Health Studies, University of Stavanger, Stavanger N-4036, Norway

Full list of author information is available at the end of the article

the Ministry of Education sets requirements for the inclusion of interprofessional teamwork in health education. Reviewing lessons learned from the Norwegian initiatives, Clark [12] concluded that the emerging positive outcomes have been somewhat impaired by lack of resources.

Previous studies by Kyrkjebø *et al.* [13] and Bjørke [14] noted that Norwegian students are not sufficiently exposed to interprofessional teamwork during their clinical training. Other Norwegian studies reported similar results [15,16]. Aase *et al.* [8] found that theoretical lectures on interprofessional teamwork were not followed-up in clinical training, especially in nursing schools. Medical schools exposed their students to more interprofessional training, but still fell short of full compliance with the WHO recommendations [8]. The reasons for this are partly because of structural constraints, such as resources, and partly because of faculty and students' attitudes [12].

Saroo *et al.* [17] argue that successful interprofessional training should take advantage of the students' psychosociological determinants, such as professional role behavior, hierarchy, and power relations.

Based on this information, we surmise that a thorough understanding of the students' perspective is imperative for designing successful interprofessional training. The current study analyses data from focus group interviews with nursing and medical students who had been exposed to interprofessional teamwork during their clinical training in Norway. Grounded in the students' perceptions, the analysis aims at describing patterns and recommendations for the design of future interprofessional training. Note that the qualitative framework allowed the students to include reflections on the group processes – i.e., the focus group interviews – that were part of the current study.

Conceptual background

Interprofessional teamwork is discussed by Reeves *et al.* [9] who stated that the concept implies common goals, shared team identity, shared commitment, clear team roles and responsibilities, interdependence between team members, and integration between work practices [pp. 3–4]. West *et al.* [18] concluded that clear professional roles are essential, and that team members may benefit from a comprehensive understanding of both their own professional role and the professional roles of their colleagues. Petri [19] suggested that interprofessional teamwork is best attained through an education that promotes mutual trust and respect, effective and open communication, and the awareness and acceptance of the roles, skills, and responsibilities of participating disciplines. Damour and Oansan [20] noted that educational efforts should be marshalled early in the curriculum, prior to the solidifying of professional identities and the formation of stereotypes.

Some authors have suggested that interprofessional teamwork requires strong collaborative skills that are not included in the training of health professionals [2,21]. Others have hypothesized that the lack of attention to interprofessional teamwork in educational programs may reflect an expectation that professionals will intuitively know how to work collaboratively [9].

Methods

Design

This study used a qualitative design, using focus groups as a vehicle for acquiring the viewpoints of many respondents in a short period of time. The hallmark of focus group interviews is that interaction among participants tends to stimulate richer or deeper expressions of opinion [22]. The reporting of the methodology of this study follows the RATS (Relevance, Appropriateness, Transparency, Soundness) guidelines for qualitative studies.

Based on data obtained from four focus group interviews with nursing and medical students in Norway, this study was guided by two research questions:

- What are students' perceptions of their professional roles in the context of interprofessional teamwork?
- How do students perceive interprofessional teamwork arenas?

The term *arena* is used here to denote the setting and occasion underpinning team work, for example, ward rounds. The questions were grounded in our goal to conceptualize students' perceptions to guide the design of future interprofessional training. The first research question was constructed to focus on professional roles that have been reported to have a strong effect on interprofessional teamwork [e.g., 9]. Assuming the students would easily recognize professional role behavior, we focused on this rather than on more abstract concepts.

The second question directs attention towards arenas with the potential for interprofessional teamwork, assuming these venues may serve as bases for future training.

Defining the main themes of the current study, the research questions were used by the group facilitator – the second author – who steered the discussion to maintain focus. The research questions also guided the structure of the focus groups.

Pilot testing of questions

To ensure that the students would adequately understand the questions in the interview guide, pilot interviews were conducted with two groups of nursing students. These students were excluded from the ensuing research interviews.

Context

The data were collected during the clinical training period of 42 medical students and 180 nursing students at a university hospital in Norway in the autumn of 2011. Medical and nursing students were enrolled in study programs at two separate universities.

Participants

The demographic data are shown in Table 1. The nursing and medical students were comparable in terms of their gender distribution, and the nursing students tended to be somewhat older.

When we invited participants, we selected students with a certain amount of clinical training and who had been exposed to interprofessional teamwork in their clinical training. These criteria led us to invite medical students in the seventh semester and nursing students in their fifth semester. A web site for educational institutions was used to invite the nursing students to participate in the study. The medical students were invited through their supervisor at the hospital. The four groups were composed as follows:

- Group 1 Homogenous group of seven medical students.
- Group 2 Homogenous group of four nursing students.
- Group 3 Mixed group of three medical and four nursing students.
- Group 4 Mixed group of two medical and two nursing students.

Owing to practical constraints, Groups 2 and 4 only contained four participants each. Although small, we found that these groups still elicited a broad range of ideas and comments. Data on participants' age, gender, educational program, clinical practice, and professional experience were recorded.

Data collection

Each group was interviewed once (four interviews altogether) in sessions that lasted about 1 hour. The

Table 1 Demographic data

N 22	Nursing students	Medical students
Participants	10	12
Gender	6 female, 4 male	7 female, 5 male
Age	20-29 years: 6 30-39 years: 4	20-29 years: 12 30-39 years: 0
Clinical practice experiences includes clinical training in education	1-3 years: 5 4-6 years: 2 7-9 years: 0 10-15 years: 3	1-3 years: 4 4-6 years: 7 7-9 years: 1 10-15 years: 0

interviews were conducted by two researchers to make reliable observations and avoid "moderator dominance" [22,23]. After the fourth group interview had been conducted, the recorded data showed little variation and as new information was not identified, the interview process was discontinued [23].

Field notes and a reflective diary were used to capture observations and non-verbal information during the focus group sessions. Audiotaped recordings of each group session were transcribed and analyzed prior to undertaking the next group interview. An interview guide was developed to guide the researchers and interviewers. The guide was modified after each interview session to focus on areas requiring further exploration and inquiry.

Data analysis

The analysis was designed to capture textual content related to the research questions based on the transcribed text [24]. The resulting material was subsequently combined into one text that was subject to the researchers' scrutiny and qualitative content analysis [24]. "Meaning units" (i.e., groups of words or phrases reflecting similar content and context) were identified, condensed and coded. The coded data were organized into sub-themes and aggregated into themes that reflected the content of professional roles and interprofessional teamwork, as summarized in Tables 2 and 3 [24]. Following Polit and Beck [22] and Graneheim and Lundman [24], a process of collaborative analysis - engaging all of the authors to reduce subjective bias - was adopted to enrich reflection on the data and interpretations of them. The analysis ended when saturation of content and themes was achieved [22,24].

Ethical issues

No ethical issues were identified. The study was approved by the University of Stavanger, Head of department, Department of Health Studies, and by the University of Bergen, Vice Dean of Research, Faculty of Medicine and Dentistry, as well as the Norwegian Social Science Data Service (NSD) [No 28383]. Since no patients or patient information was involved, the study did not require an approval from the Norwegian Regional Committees for medical and health research ethics. The participants were asked to sign an informed consent form prior to the interviews.

Table 2 Theme and Subthemes within "Responsibility in Professional Roles"

Theme	Responsibility in professional roles		
Sub-themes	Taking responsibility	Sharing responsibility	Avoiding responsibility

Table 3 Theme and subthemes within “Use of Interprofessional Arenas”

Theme	Use of interprofessional arenas		
Sub-themes	Collaboration and learning	Status quo	Frustration

Results

The analysis identified two major themes that resonated across all four groups, which were labeled “*Responsibility in professional roles*” and “*Use of interprofessional arenas*.” While the overlap with the research questions is seen in the terms “professional roles” and “arenas,” the concepts of “responsibility” and “use of” emerged from the coding and should be considered grounded in the data.

The following sections present both main themes, and the corresponding sub-themes, which are summarized in Tables 2 and 3. We also describe findings pertaining to the group *processes*—i.e., the focus group interviews—that were conducted as part of this research study.

Responsibility in professional roles

The coding introduced three subthemes: *taking responsibility*, *sharing responsibility* and *avoiding responsibility* (see Table 2) that were subsumed under the main theme: *Responsibility in professional roles*. The data strongly affirmed that the students’ education influenced their professional understanding of and relation to responsibility.

Taking responsibility

Medical students explained that a manifest and clear role expectation was conveyed to them during theoretical lectures and clinical training. Referred to as elite students, their importance and grave responsibility were highlighted from day one and continually thereafter. The students mainly perceived their medical education as being designed to produce General Practitioners (GPs) who were expected to work individually and not in teams. Hence, the educational program stressed, according to students’ assertions, the importance of individual determination, including an aptitude for taking responsibility and driving decision-making.

A medical student stated:

The program has a clear focus on what is expected of many of us; we have to deal with things there and then, and we have to spend much of the time alone. (Medical student 1)

Asked to comment on the capabilities of nurses, the medical students revealed a lack of knowledge, having little or “no knowledge of nursing education”. Unaware that the nursing students had been trained to measure blood pressure, some of the medical students explained

that they were prepared to do the measurements themselves rather than asking for a nurse’s assistance.

Despite this ignorance, a few medical students had experience in medical programs that attempted to bridge the knowledge gap between the professions, resulting in the introduction of a “Follow a Nurse” program. A medical student commented:

A video “Follow a Nurse” shows what nurses do through a working day, how many patients they are responsible for, what expectations they have to the education and clinical training, as well as to themselves and their future colleagues. (Medical student 4)

Sharing responsibility

Contrary to the medical students, several nursing students expressed that they had a perception of being encouraged, both in theoretical lectures and in clinical training, to *share responsibility* while working in teams. They described their function as “the glue” that organized teamwork around the patient, a function that often required nurses to perform various tasks overlooked or neglected by other team members, tending to force nurses into a “handyman” type of role. The coordinating function apparently conferred a sense of cross-disciplinary and shared responsibility upon the nurses, suggesting that the underlying student statements should be classified under the subtheme *sharing responsibility*.

A nursing student commented:

I feel that we as nurses are doing a bit of everything; we are dealing with issues that are left behind by other professionals. (Nursing student 7)

A medical student expressed:

In the ward, one notices immediately that the nurses are coordinating everything around the patient. We ask the nurses if we need information. (Medical student 3)

Some nursing students experienced themselves as being complementary and supportive to the physicians, in a collaboration bolstered by a sense of shared responsibility. Responsible for measuring vital signs and preparing observational data sheets as well as other materials, the nursing students had noted that the physicians used and relied on the information, thereby reinforcing an impression that the nurses’ role was an important and necessary one. A nursing student said:

In clinical training, I appreciated collaborating with the physician when he took me seriously and I understood that what I prepared was really important to him. (Nursing student 2)

A medical student acknowledged that responsibility for communication with the patients, could sometimes benefit from being shared with nurses:

If the physician is incompetent to speak with patients, the nurses do the talking. They are good at it. If the patient lacks courage to speak with the physician, they can ask the nurse to do it. (Medical student 8)

Avoiding responsibility

A number of students made comments that were classified under the subtheme *avoiding responsibility*. Inadequate understanding of professional roles, unclear communication mixed with intimidation, fear and insecurity were factors that fueled *avoidance of responsibility*, according to the students. These assessments were articulated mostly in statements made by nursing students, but also by some medical students who reported distress and insecurity in hierarchical situations dominated by senior physicians or nurses.

A nursing student stated:

I do not know what is right to do when the nurses and the physicians are arguing, it is in many ways scary. I get insecure when they are blaming each other. I hope it never happens to me. (Nursing student 10)

A medical student noted:

Some of the senior physicians are really strict; I fear asking him if I am in doubt of something and when I am working in a new ward, some of the "old nurses" can be quite rude, saying "as a medical student you should know this." (Medical student 8)

Some nursing students had been given advice to refrain from taking part in discussions:

In clinical training, I learned to follow orders from the physicians, and some of my supervisors recommended me not to voice my own opinions if "that physician" asked for special arrangements. (Nursing student 2)

Both student groups found that nurses deferred to physicians. Several nursing students recalled that they had given up their chairs to physicians, to let the physician have a better view of what was being presented. Such patterns of servility were perceived by some nursing students as detrimental to their role as team members.

A medical student had noted that the nurses' attitude might not be welcomed by the physicians:

I think there are many nurses behaving as if the physicians are exalted and elevated above themselves.

I am not certain that the physicians want this role. (Medical student 5)

Use of interprofessional arenas

The students' experiences with existing interprofessional arenas varied widely in clinical training. The analysis elicited three subthemes termed *learning and collaboration*, *status quo* and *frustration* (see Table 3). The student assessments highlighted that the teamwork they had experienced was strongly affected by the arenas through ward culture and administration.

Some wards maintained several arenas for interprofessional interaction, such as wards rounds, pre-visits ("huddles"), shared working areas, joint computer resources and, intermittently, common lunches. Others were more limited, and the interprofessional arenas were in many cases limited only to the ward rounds.

There was little focus on existing interprofessional arenas in the theoretical lectures.

Collaboration and learning

The students experienced wards with a favorable culture that students described as being characterized by the term "mutual respect." Professionals on these wards actively used interprofessional arenas, for example ward rounds, to facilitate *collaboration and learning*. Some students described staff on these wards as role models, and enjoyed collaborating with them.

Feeling they were treated as valuable members of the team, many nursing students described the wards at psychiatric hospitals as favorable arenas for interprofessional teamwork. A nursing student elaborated:

In the psychiatric ward, my voice does count. There, the physicians and nurses ask me about patients' situations, what I have done together with the patients and what I think will help the patients. (Nursing student 12)

The same applied to some degree to rehabilitation wards. In general, several students recommended ward rounds as arenas for educational efforts, such as courses, targeting interprofessional teamwork. A nursing student expressed:

Ward rounds may be a good arena for learning interprofessional teamwork, since both nurses and physicians jointly meet the patients together there, and we can learn from our supervisors how our own profession communicates both with patients and other professions in a real situation. (Nursing student 9)

Some students suggested orchestrating training in interprofessional teamwork early in the students' educational plan, contending that that would give the students a more "solid basis" for future collaborative work. Others pointed

out that the timing would have to be balanced against other activities prioritized in the curriculum.

Status quo

Some wards were perceived by the students as “*old fashioned and status quo*” and “*hierarchical characterized by silo thinking*”. Physicians showed little interest in other professions’ tasks and capabilities. The students also observed that experienced nurses and physicians worked together in inflexible and traditional structures, following their own entrenched procedures regardless of whether new guidelines existed. Nursing students experienced little debate between professions, even in cases where disagreement regarding treatment and care obviously prevailed. The nurses preferred to confront the physician after the rounds in a more informal setting, or not at all.

Having experienced disparities between the day and afternoon shifts, some students contended that nurses and physicians appeared to collaborate better with less pressure during the afternoon shifts. Night shifts could not be discussed because of lack of experience among the participants in the current study.

The statements captured under *status quo* revealed that the majority of the students had few arenas for practicing teamwork skills. When discussing suggestions to train collectively, a group of students mentioned AHLR (acute heart lung resuscitation), or “ward rounds” as potential scenarios for training. Moreover, some medical students expressed a need for guidelines on how to conduct ward rounds:

Nobody ever told me how to do ward rounds. And what are they for: updating the nurses or the physician? Is the patient the focus? Nobody ever told me. The ward rounds represent the few minutes a day the patient has with the physician. (Medical student 8)

Frustration

A group of students described certain wards as arenas where the prevailing communication style was unpleasant and disrespectful to the hospital staff, students, and patients. Expressions of these concerns were categorized under the sub-theme *frustration*. As one medical student stated:

It's really up to each physician. For example, if they are very confrontational during the pre-visit. Some physicians have confidence in nurses. Others do not and demonstrate this by making fools of the nurses or finding other ways to be unpleasant. You can really feel this in the atmosphere of the ward. (Medical student 6)

Perceived as an important parameter, the chief physician’s communication style was raised as a concern in a number of statements. Some chief physicians failed to prioritize supervising or even having discussions with

students. Nursing students, in particular, misconstrued this behavior, seeing it as a request for them to remain “invisible” by refraining from commenting and actively engaging in the situation. The physicians, in turn, misunderstood the quiet nurses, assuming they were difficult to deal with.

In some wards, the only arena for interprofessional teamwork was the ward rounds. According to some students, this was sometimes because of the infrastructure. A nursing student pointed out:

Infrastructure and the buildings do not facilitate collaboration. We have separate working areas, the informal conversation and the informal interprofessionality are not present, and we have no designated meeting rooms. (Nursing student 11)

Both student groups described a lack of attention to interprofessional teamwork in their education: “We have little theoretical lecturing in interprofessional teamwork and interprofessional communication.”

A medical student described participation in a course in communication:

The course was limited to one specific arena and not defined as a learning activity with evaluation and learning outcomes all the way through our clinical training. The course was never mentioned again by our supervisors and teachers ... what was the intention? (Medical student 2)

In contrast to the nurses, who appeared to be able to communicate more personally and emotionally with the patients, the medical students were reluctant and even somewhat frightened of revealing too much about themselves in “in-depth” conversations, even if they claimed to be committed to the well-being of their patients.

Some of the medical students admitted being concerned about their future positions demanding leadership skills; stating that nobody had taught them how to become good leaders.

The group process

The focus groups of the current study were in themselves recognized as arenas for interprofessional collaboration by the participants. This section presents findings pertaining to the functioning of the focus group interviews rather than the students’ experiences in clinical training.

Several of the students expressed their appreciation for the focus groups, emphasizing the insight they had gained into each other’s roles and work tasks.

A medical student (from one of the mixed student group) summarized his view as follows:

These focus groups are an excellent arena for learning to know each other as human beings and as professionals. The group discussion made me realize that I would benefit from learning about interprofessional teamwork during a ward round. (Medical student 10)

However, several students pointed out that the discussions in the homogenous groups suffered from lack of knowledge about the profession not represented. The missing information was to some degree substituted by guesses and stereotypes. Contrarily, the mixed group discussion was characterized by more mutual interest and respect, according to the students.

Discussion

The aim of this study was to conceptualize students' perceptions of interprofessional teamwork, seeking to describe patterns and recommendations that may guide the design of future interprofessional training. The results showed that nursing and medical students perceived responsibility differently; the nursing students were more inclined to share responsibility than the medical students, who regarded taking responsibility more as an individual obligation.

The use of interprofessional arenas varied broadly from promoting collaboration and learning, to maintaining entrenched workflows (status quo), and finally to discourage collaboration in a manner perceived as frustrating.

Role perception

The results presented in this study suggest that traditional patterns of professional role understanding reported in previous studies (Manias *et al.* [25] and Fougner *et al.* [26]) are still prevalent among medical and nursing students—in medical and nursing schools, as well as in clinical practice. Zaccagnini *et al.* [27] argued that role identification and clarity are necessary ingredients to empower nurses to work in interprofessional teams. Yet, there is little evidence to support the notion that role identity alone is a sufficient factor for effective interprofessional team performance. Notably, several medical students with a strong awareness of role identity, perceived themselves as reluctant to share responsibility, which is arguably a fundamental pillar of teamwork. The findings presented here, in keeping with the emphasis on mutual respect, cross-disciplinary communication and knowledge bridging the gap between professions, lead us to hypothetically suggest that a more balanced relationship between professional role identities, conferring a more similar sense of expectations and responsibilities, may be key to building effective interprofessional teams.

A finding of particular interest to the design of future training, is that both student groups expressed lack of knowledge about each other's roles and responsibilities which, in many cases, led to uncertainty and behavior

rooted in established hierarchical role understanding. These findings resonate with the studies of Pollard [28] and Thistlethwaite [29], suggesting that the knowledge gap should be addressed by educators and health institutions.

Adversarial team culture

Related to the role patterns discussed above, our results suggest that factors linked to team culture serve to discourage nurses from assuming responsibility. Vaismoradi *et al.* [30] showed that a perception of insecurity, fear and hierarchy discouraged nurses from taking responsibility. Student statements presented here, mainly categorized under the sub-theme *avoiding responsibility*, suggest that elements of such a work culture still prevail. Nursing students and some medical students had experienced being deterred by conflicts, reproaches, and a sense of being sidelined and alienated. Discussing such behavior, Street [31] introduced the concept of *differential visibility*: “nurses becoming visible or invisible to others depending on the person, the place, the time ...” (p. 51). Nursing students in the current study expressed reluctance to voice their opinions, and hence became “visible” to the other team members. This pattern of conduct may adversely affect the treatment and care of the patient, especially since nurses observe patients for extended periods of time and may possess information unknown to the rest of the team [25,32,33].

Some of the medical students stated they also had encountered a sense of insecurity in their role performance during the ward rounds.

Use of interprofessional arenas for learning

Analysis of the students' statements unveiled a wide variation in the perception of interprofessional arenas, depicting them as venues characterized by collaborative learning, distrust, confrontation, disrespect, and hierarchical structures.

A number of students concluded that the daily rounds – and the corresponding “huddles” – offered preferred arenas for interprofessional teamwork training. The justification for this varied, but rested at least partly on the impression that the daily rounds and “huddles” allowed time for at least a minimum of discussion between team members, although this depended on the chief physician in charge. The purpose of daily rounds was somewhat ambiguous, and some students expressed that a training effort might focus on the clarification and redefinition of its purpose. It was also mentioned that the daily rounds afforded the patient an opportunity to voice concerns. The students' reasoning on this point is supported by Nikendei *et al.* [34] and Williamson *et al.* [35] who concluded that ward rounds training was urgently required. Nørgaard *et al.* [36] and Weber *et al.* [33] also who suggested that daily rounds should be considered one of the most important arenas for promoting interprofessional training in clinical practice. Caldwell *et al.* [37] and Stew

[38] asserted that the best arenas for learning teamwork are characterized by well-established teams that hold regular meetings, and that involve patients in care decisions, criteria that seem to some degree to be consistent with typical daily round procedures.

Several students from both groups advocated psychiatric and rehabilitation wards as arenas conducive to interprofessional teamwork. The underlying psycho-sociological processes are not obvious, but many students associated the psychiatric ward culture with qualities favorable to interprofessional teamwork, and mentioned that they felt "accepted and respected" more than in other wards. This suggests that more research is warranted to untangle what attributes of the psychiatric ward culture that favor teamwork, and to further investigate whether these qualities can be exploited in other arenas.

With few or no student arenas for formal training in teamwork skills, the participants in this study perceived the focus group interviews, themselves, as a valuable arena for knowledge exchange. This suggests that the format of focus group interviews may merit further use in university health care programs and in health institutions.

Limitations

The present study's use of a small sample of students prevents these findings from providing an accurate representation of the sentiments of all medical and nursing students at these universities. The study took place at a single clinical training institution in Norway. As a result, the applicability of its findings may be limited.

Conclusions

Based on focus group interviews with nursing and medical students, the current study demonstrated that interprofessional teamwork is significantly affected by the professional role identities of the participants. Traditional patterns of professional roles is still highly prevalent in health care teams, influencing several aspects of teamwork, including the participants' predisposition to communicate freely and share responsibility, both of which are considered fundamental pillars of teamwork.

Moreover, our results indicate that medical and nursing students suffer from a lack of mutual knowledge of each other's competence and capabilities.

The study also found substantial variation in the perception of the various interprofessional teamwork arenas, ranging from arenas favorable to collaborative learning to arenas characterized by distrust, confrontation, disrespect, and hierarchical structures.

When recommending an arena for interprofessional team training, many students advocated for daily rounds and the corresponding "huddles", or alternatively, a psychiatric ward, options that seem to reflect many of the criteria proposed in previous studies.

Competing interests

The authors declare that they have no competing interests. The authors alone are responsible for the writing and content of the paper.

Authors' contributions

IAA, BSH and KA designed the study. IAA and BSH conducted the data collection and IAA drafted the manuscript. All authors contributed to the data analysis. BSH and KAA provided critically important feedback to improve the manuscript. All authors read and approved the final manuscript.

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Author details

¹Department of Health Studies, University of Stavanger, Stavanger N-4036, Norway. ²Department of Health Studies, University of Stavanger and Stavanger University Hospital, Stavanger N-4036, Norway.

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Paper III

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Paper IV

REVIEWS

Interprofessional communication in a simulation-based team training session in healthcare: A student perspective

Ingunn Aase *¹, Karina Aase¹, Peter Dieckmann², Conrad Arnfinn Bjørshol³, Britt Sætre Hansen¹

¹University of Stavanger, Department of Health Studies, Stavanger, Norway

²Danish Institute for Medical Simulation (DIMS), Center for Human Resources, Denmark

³Stavanger University Hospital, Department of Anaesthesiology and Intensive Care, University of Bergen, Department of Clinical Medicine, Norway

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ABSTRACT

Background: Interprofessional teamwork and communication training have entered the healthcare education setting, mainly investigated through surveys. However, little is known about the student's perceptions in more depth. The aim of the study was to investigate healthcare students' perspectives and attitudes towards interprofessional communication in a simulation-based training session.

Methods: The study was designed as an explorative case study based on qualitative content analysis. Data was based on observation of two simulation scenarios ("Internal Bleeding", "Huddle") and analysis of debriefing sessions with a sample of 48 nursing and medical students in Norway. The study was conducted in May 2013.

Results: We found that interprofessional communication was characterized by two main features: clinical exchange and collaborative exchange. While clinical exchange is "objective" and dependent upon clinical information, clinical skills, and standardized tools and procedures (e.g. SBAR), collaborative exchange is less "formal" and relies on dialogue, cross-disciplinary knowledge and role identity. Students seem to direct most of their attention to clinical exchange, while the patient perspective seems less explicit in the training session.

Conclusion: Exploring the student perspective of interprofessional communication has the following implications for the design and implementation of simulation-based training sessions: (a) to balance clinical exchange and collaborative exchange, (b) to introduce patient-centered exchange, and (c) to contextualize standardized communication tools such as SBAR.

Key Words: Interprofessional communication, Nursing student, Medical student, Simulation, Debrief, Content analysis

1. INTRODUCTION

There is a growing consensus that interprofessional teamwork is crucial for fostering healthcare performance and for minimizing adverse events.^[1-8] Against the backdrop of complex clinical procedures, teamwork is believed to play a key

role in preventing adverse events by means of sound communication, leadership, workflow, and awareness of risks.^[3]

Following this, healthcare providers adopt different training efforts to ensure that teams are working and communicating according to predefined protocols. One such effort is

* Correspondence: Ingunn Aase; Email: ingunn.aase@uis.no; Address: University of Stavanger, Department of Health Studies, NO 4036 Stavanger, Norway.

the deployment of critical event training and simulation, using standardized communication protocols.^[9] The focus on stringent communication has generated several new tools, including the situational briefing tool SBAR (Situation, Background, Assessment and Recommendation – is designed to function as a checklist and to structure the team’s exchange of information^[10]). Marshall *et al.*^[11] and others have published compelling evidence in favor of SBAR, stating that using a structured method improves communication such as a telephone referral in a simulated clinical setting.

1.1 Background

As part of the training efforts, several authors point to the benefits of interprofessional team training^[12–14] by documenting positive effects on attitudes and knowledge as well as improved team performance and patient care after simulation training.

Other researchers, however, have cast doubt on the cost-effectiveness of such efforts and questioned the clinical and patient outcomes of the training, asserting that the research is not yet conclusive.^[15, 16] One reason might be biases; when asked immediately after a training session, participants are inclined to overrate its value. After reviewing the literature, McCulloch *et al.*^[15] conclude that there is some evidence for training interventions targeted at improving teamwork.

Interprofessional teamwork training efforts have entered the healthcare education setting under the heading of interprofessional education (IPE).^[7] To date, the student perspective on interprofessional communication and teamwork has been investigated mainly through pre- and post-training surveys.^[4] In this study, we wanted to explore the students’ perceptions in more depth, and carried out observations and analysed debrief conversations in a simulation-based training session for nursing and medical students. The study is set in Norway where the Ministry of Education has instructed educational institutions to include interprofessional team training as part of the nursing and medical education.^[17] To develop effective interprofessional training sessions, we surmise that the perspectives of the users (*i.e.* the students) constitute an important source of information.

1.2 The study aim

Against this backdrop, the present study aims at describing the student perspective on interprofessional communication, in order to improve the design of future interprofessional teamwork training efforts. In particular, we wanted to investigate the students’ perceptions of standardized communication tools such as SBAR. The following research questions have guided this study:

- (1) What characterizes interprofessional communication

among nursing and medical students in a simulation-based training session and how do students describe it?

- (2) How do nursing and medical students perceive the use of SBAR in a simulation-based training session?

2. METHODS

The study is designed as a qualitative exploratory case study.^[18] The case is defined as the interprofessional training session with participants from a Norwegian nursing faculty and medical faculty. The exploratory case study is seen as a suitable design for gaining in-depth knowledge of a little-known phenomenon. The phenomenon under study here is interprofessional communication among nursing and medical students and the students’ experiences with a structured communication tool.

2.1 Case context: A simulation-based training session

The simulation-based training session for interprofessional communication was designed based on standard simulation principles using preparation, demonstration, briefing, simulation, and debriefing as the main phases.^[19] The training session was designed according to two simulation scenarios: “Internal Bleeding” (S1) and “The Huddle” (S2). All student groups conducted both scenarios. Table 1 displays the key components of the training session, including pre- and post-simulation activities.

The booklet given to the students prior to the training session was developed by an interprofessional group consisting of a medical doctor, a nurse, and a researcher (first author). An extended interprofessional group designed the training session, recruited the students, and conducted the SBAR demonstration. The facilitators – a physician in S1 and a nurse in S2 – were experienced clinicians in emergency medicine (S1) and surgical care (S2).

In the S1 scenario, the internal bleeding, the clinical observation elaborated that a female patient who has just undergone laparoscopic surgery for removal of ovarian cysts, felt cold and complained about increasing pain (simulation briefing). Later, the patient – represented by a manikin (SimManTM, Laerdal, Stavanger, Norway) – showed additional symptoms indicating internal bleeding and an increasing degree of hypovolemia (during simulation), after which the scenario should ensue with diagnosis and treatment. In the briefing prior to the simulation, in addition to informing the student groups about the patient conditions, equipment, and facilities, the student groups were encouraged to use SBAR.

The S2 scenario, the huddle, emulated events occurring during the meeting arranged prior to daily ward round. The

facilitator acting as a “night nurse” briefly reported the status of three patients. The student groups were expected to plan the ward round, when shortly after, another nurse reported that the condition of one of the patients was deteriorating. Requested to use SBAR, the student group had to organize appropriate interventions.

Table 1. Key components of the simulation-based training session

Training component	Timing	Contents	Purpose
Booklet to the students	One week prior to the training session	Introduction to SBAR, and interprofessional teamwork	Introduce the students to the main purpose of the training session
Demonstration of SBAR	At the start of the training session (15 minutes) in plenary	Two facilitators – a nurse and a physician – role-played a poorly conducted SBAR conversation followed by a best practice SBAR conversation	Raise the students’ awareness of SBAR and how to conduct it, and develop a representation of the learning goals
Simulation briefing related to facilities and equipment for the two scenarios	20 minutes	To familiarize the student groups with the simulation setting	Ensure that students are familiar with the simulation setting and how to use the simulator as a technical device
Scenario briefing related to patient conditions and logistics for the two scenarios respectively	5 minutes	To familiarize the student groups with the scenarios and the SBAR tool	Ensure that students are familiar with the patient case(s) in the scenarios, and that they are aware of SBAR
Simulation, “Internal bleeding” (S1) or “Huddle” (S2)	15-20 minutes	A facilitator (physician in S1 and nurse in S2) supervised the interprofessional student groups through the simulation	To conduct the scenario according to best practice as laid out in preparation, demonstration, and briefing; and to create a common experience episode that can be debriefed later
Debrief related to interprofessional communication for S1 and S2 respectively	20-45 minutes	The facilitators steered the group conversations to capture learning points and consider improvements	To inspire the students to discuss and reflect upon interprofessional communication and the use of SBAR

During the simulation and ensuing debrief, the facilitators supervised the student groups in each scenario, mainly to ensure that the students covered the pre-defined learning outcomes related to interprofessional communication and SBAR. The 20- to 45-minute debrief sessions were designed to stimulate interprofessional reflection and discussion in a semi-formal setting.^[19-21] The facilitators could ask questions about challenges in conducting the scenario, using the SBAR, and student communication, and to ensure that all students participated in the discussion.

2.2 Participants and data collection

Over a two-day period in May 2013 a total of 48 students (8 groups) conducted 16 simulations (S1 and S2). Each group had 3-4 medical students (Faculty of Medicine, university 1) and 2-3 nursing students (Nursing School, university 2), a total of 5-7 students in each group. The nursing and medical students were in their third and fourth year, respectively; at a stage where they were expected to have had some experience with interprofessional communication in clinical work. Medical students assumed the role of physicians and nursing students assumed the role of nurses in charge of the patient. Two or three students were observers and the observer role rotated between students in each scenario. A total of 26

medical students (16 female and 10 male, age range: 20 - 30 years) and 22 nursing students (19 female and 3 male, age range: 20 - 45) participated in the study.

The debrief sessions constituted the main data material of the study. Debrief sessions were audiotaped. Moreover, the first and last authors were observers, taking field notes according to an open observation guide addressing topics such as communication patterns, roles, leadership and responsibility. Field notes were collected during the simulation and the researchers consulted the notes during data analysis.

2.3 Ethical approval

The study was approved by the two universities (medicine faculty, university 1 and nursing school, university 2), the hospital in which the students were enrolled in their practice periods, and the Norwegian Social Science Data Service (NSD) (No34416). All participants were informed of the objective of the study and that they were free to participate or withdraw from the study at any point without any negative consequences. Participants gave written consent to be involved in the study and for the debriefing sessions to be audio-recorded. All data were coded to prevent person identification.

2.4 Data analysis

The data consisted of transcribed audio recorded files of the debrief sessions (138 pages), in addition to transcribed field observation notes (8 pages). The transcribed debrief data was subjected to content analysis to conceptualize the perspectives of the students.^[22,23] The content analysis progressed inductively from meaning units to categories and themes. Following Graneheim and Lundman,^[23] Miles and Huberman^[24] and Polit and Beck^[22] a latent analysis at an interpretative level was performed by the authors in order to

ensure a broad and valid analysis of the data. Table 2 displays the analytical steps from condensed meaning units to categories to theme for one of the main themes, collaborative exchange. The analysis was inductive in the sense that the main themes were distilled from data rather than adapted to established theories. Field observation notes were used as a basis for the descriptive parts of the results, explaining how the interprofessional communication proceeded in the simulations.

Table 2. Collaborative exchange: The analytical process relating meaning units to condensed meaning units, categories and theme

Theme	Collaborative exchange		
Categories	Team dialogue	Cross-disciplinary knowledge	Identity and roles
Condensed meaning units	Chatting and asking each other questions	No knowledge of nursing tasks	Nurses are anxious when calling the physician
Meaning units	I found it very useful that both student groups [nursing, medical students] chatted and asked each other questions and that the dialogue bounced back and forth	I had no idea what the nurses are doing, I would like to know more about it, though	I feel anxious when calling the physician, but the feeling tends to diminish after a while, especially when you have a checklist to guide you

All data were jointly coded by the authors IA and BSH, and any disagreements were solved through discussions with author KA.

3. RESULTS

By observing and analyzing interprofessional communication between nursing and medical students in a simulation-based team training session, we have identified differences in communication related to how students perceive the exchange of clinical information (research question 1), the team dialogue (research question 1), and the use of standardized communication (SBAR) (research question 2). In the following, we will present our findings under the two main themes of clinical and collaborative exchange as features of interprofessional communication amongst nursing and medical students.

3.1 Clinical exchange

The perspective of clinical exchange reflects the prevailing view of healthcare treatment and care as dependent on precise clinical information. In conducting the simulation scenarios and in the debrief sessions, students seem to direct their attention towards clinical information, also solicited by the simulation facilitators. The students tightly linked clinical information to medical treatment and “vital signs”, conceptualizing the patient from the position of an external

observer, emphasizing physiological and quantitative information needed to “repair” and “control” the patient. In the simulation scenarios, the clinical information conveyed measures of blood pressure, body temperature, heart frequency, etc. In addition, the SBAR-procedure was categorized as clinical information due to its focus on clinical parameters such as blood pressure, heart rate, body temperature and respiration rate. As a matter of terminology, the students often used the term “parameters” interchangeably with clinical data measured and maintained by the nurses, who used paper-based data sheets.

Cognizant that miscommunication could lead to patient injuries, many students emphasized the need for accurate clinical information exchange. Still, the debrief data unveiled examples of insufficient and misunderstood clinical communication. The medical students were persuaded to attribute communication failures to the nursing students’ supposed inaccuracy and evasiveness. As one medical student complained:

I dislike when the nursing students excuse themselves; I want concise and accurate information. (Medical student, S1)

Another medical student stated:

I tried to ask specific questions that could be responded in a clear manner. If the nurse has not

measured CRP (C-reactive protein) it is better to just say so. If she starts to defend herself, it takes too much time. (Medical student, S1)

The following dialogue presents another shortcoming of clinical communication:

I did not know that the patient had been in good shape only ten minutes earlier. The nursing student should have expressed this important information more clearly. (Medical Student, S1)

Yes, I should have mentioned this, but it did not strike me at the time (Nursing student, S1)

I should have asked you; I guess we are both to blame. (Medical student, S1)

Obstacles to clinical communication were frequently but not always rooted in professional and hierarchical differences, meaning that nursing and medical students have different understandings of work tasks and priorities and that nursing students look at medical students as higher in the hierarchy. The debrief data showed that nursing students sometimes found it difficult to comprehend the report delivered by an experienced “night-nurse” at the start of the simulations. The reasons were related mainly to time constraints.

Closely linked to the clinical exchange is the use of standardized communication tools, in this case SBAR and a paper-based data sheet hosting the “parameters”. The use of SBAR varied from one simulation group to another and the communication tool was only partly exploited (observations, S1, S2). The variations pertained to the degree of SBAR use, and to the SBAR elements that were in use. In one group the students never attempted to utilize SBAR at all, even if this was one of the objectives of the simulation. When asked whether they had thought of using SBAR they responded as follows:

No, I did not (Nursing student 1, S2)

Neither did I (Nursing student 2, S2)

I thought about it briefly, but I did not feel we had so much to say to each other (Medical student, S2)

Others found the SBAR too complicated to use:

I could not remember all the sub-headings of SBAR, but I believe I got through with the most important ones. It is useful because it forces you to systemize your thoughts. (Medical student, S1)

Even when SBAR was successfully adopted, there were still mistakes and misunderstandings. In a potentially adverse

incident the identity of two patients was mixed. A patient referred to as “number 2” was in fact not as such on the list of patients, however, she occupied bed No 2 (Observation, S2). In the following debrief the error was discussed and the students tried to explain the situation by referring to it as “something that can happen”.

The following dialogue underscored the student perceptions of benefits and challenges with using SBAR as part of the clinical exchange:

My first reaction was that I will never be able to remember all the 20 points, but the four major SBAR points I can manage. I feel it is okay to relate four such points... It may be an issue of training, it is good to follow a logical sequence. (Medical Student, S1)

Yes, it is good to have, because when I am stressed there are many things floating around in my head. With SBAR I experience a sense of control, even if I may not have it, but I have at least some control of what to tell the physician, in a clear and concise manner. (Nursing student, S1)

Other students emphasized that the SBAR formalism should be attuned and downscaled to suit the situation at hand:

It is useful, but at first we thought it was impossible to remember like 120 points, but then 4 key points are okay, the rest we can find on the data sheet. (Nursing student, S2).

We won't always follow it; it depends on the problem. If the patient for example suffers a simple injury to his foot, SBAR is too complex. But we can properly use it in most cases – of course it depends on whether the other team members know the patient or not. (Medical student, S2)

The students' perspectives of the patient in the simulation scenarios was difficult to grasp in data pertaining to both observations and debrief sessions. Interwoven and latent, the issue sometimes surfaced in statements related to clinical information:

I felt I needed new data [the parameters], but I did not want to ask the nurses. I find it hard to ask them to leave the meeting for acquiring the parameters. (Medical student, S2)

You should have asked; we are here for the patients. (Nursing student, S2)

In another situation, a nursing student expressed a desire for clinical information to pass on to the patient:

I got information from the physicians, regarding what X-ray they were planning to obtain, which turned out to be a chest X-ray. It was good to know since I then could tell the patient what would happen. (Nursing student, S1)

3.2 Collaborative exchange

The perspective of collaborative exchange reflects the view of healthcare treatment and care as dependent on team efforts and interprofessional communication. While the students often understood the communication associated with clinical exchange as instructions, they saw collaborative exchange as an invitation to discuss in order to reach consensus on the actions taken by the student group in the simulation scenarios. This included a more general and less formal dialogue among student group members than the one associated with clinical information. Data belonging to the theme of collaborative exchange were predominantly linked to the simulation scenario S2 ("The Huddle"). It is possible that the S2 scenario in itself was designed as a planning and communication arena.

Maintaining a broad team dialogue that might sometimes spill over in informal chatting was perceived as a fundamental feature of successful interprofessional communication in the simulation scenarios. The contents of the dialogue, the form, and the "tone" of the dialogue were seen as vital components of collaborative exchange as exemplified by the following conversation:

I found it very useful that both student groups [nursing, medical students] chatted and asked each other questions and that the dialogue bounced back and forth. (Medical student, S2)

We may have been a bit unstructured. (Nursing student, S2)

Students reflected on instances where lack of dialogue impaired team performance. Unaware that the nursing student had just checked the patient, a medical student examined the patient himself. During the following debrief the participants explained the situation:

I wanted to see the patient myself. (Medical student, S2)

Yes, but if the patient was unconscious, it would have been the first thing I told you. (Nursing student, S2)

Oh yes, we must ask each other more often. (Medical student, S2)

In some instances the medical students – out of politeness or concern for the nursing students refrained from asking them questions. A nursing student emphasized that the nurses' data and measurement was not always updated, and that

if the measurements have not been obtained, the physician should not be afraid of asking. (Nursing student, S2)

The interprofessional dialogues between nursing and medical students in the simulation scenarios, and in the debrief sessions documented the importance of chatting, trust, frankness and information relevance for the collaborative exchange to be effective. In these informal team dialogues clinical exchange was often embedded indirectly by reference to, for example, the measured "parameters". In the same vein, the patient perspective in some occasions could be referred to in the team dialogues. As one nursing student stated:

We should have discussed this together. We are supposed to improve the situation for the patient. (Nursing Student, S2)

The effectiveness of the collaborative exchange also seemed to rely on a minimum of cross-disciplinary knowledge across nursing and medical students involved in team training. In the current training session context, this requirement seemed flawed. Medical students expressed concerns that a lack of knowledge regarding the nursing tasks and practices could hamper the team dialogue. A medical student conceded that

I had no idea what the nurses are doing, I would like to know more about it, though. (Medical student, S2)

Another medical student stated that:

I was unaware of the nurses' time schedule and workload, the patient to nurse ratio, etc. (Medical student, S2)

In contrast, nursing students were inclined to overrate the medical students' insights into the practical aspects of nursing, and found it difficult to accept that the medical students were unfamiliar with the graphs and datasheets maintained by the nurses. Some of the medical students did not even know that the nurses maintained such data sheets. A medical student conceded that

I did not know that a data sheet with background information existed. (Medical Student, S2).

The lack of cross-disciplinary knowledge also seemed to be reinforced by professional boundaries related to identity and roles indicating uncertainty and traditional role hierarchy. A nursing student remarked:

I was also certain that it was an intra-abdominal bleeding, but I did not dare to say it because it is the physicians who make the diagnoses. (Nursing student, S1)

Some of the nursing student admitted feeling uncertain and afraid when calling a physician. As one student stated:

I feel anxious when calling the physician, but the feeling tends to diminish after a while, especially when you have a checklist to guide you. (Nursing student, S1)

Not wanting to be intimidated, some medical students expressed similar concerns regarding contacting more experienced colleagues, usually physicians, but occasionally nurses. Planning and discussion tended to happen in parallels in nursing and medical student sub-groups respectively, rather than across disciplines. A nursing student explained:

When we received the report of the night nurse, I said that if you care for patient number 1, I will attend to the two other patients. So we nurses had already organized a little, but we knew nothing about the physicians. I assumed they had their own system. (Nursing student, S2)

4. DISCUSSION

In this study we have established the characteristics of interprofessional communication among nursing and medical students in a simulation-based training session analyzed according to the two themes of clinical exchange and collaborative exchange. The two themes are interrelated but also hold unique characteristics. While clinical exchange is “objective” and dependent upon clinical information, clinical skills, and standardized tools and procedures (*e.g.* SBAR), collaborative exchange is less “formal” and relies on dialogue, cross-disciplinary knowledge and role identity. Students seem to direct most of their attention towards clinical exchange while still valuing the more informal dialogue and discussion elements of collaborative exchange. The patient perspective seems less explicit in the training session as observed in the simulation scenarios and in the debrief sessions. Overall, focusing on the students’ perspectives of interprofessional communication has several implications for the design and implementation of simulation-based training sessions across the nursing and medicine specialties. Below we will address the most vital issues.

4.1 Balancing clinical exchange and collaborative exchange

In the reported study the current training session contained two simulation scenarios, Internal Bleeding and the Huddle, facilitated by an experienced emergency medicine physician and an experienced surgical care nurse, respectively. It was perhaps inevitable that interprofessional communication in

the Internal Bleeding scenario and debrief was characterized by clinical exchange while communication in the Huddle scenario and debrief was focused on collaborative exchange. A recent study of different stakeholder groups’ (students, university faculty, hospital staff) views on interprofessional training in the same Norwegian case context found similar requirements for balancing clinical professionalism (clinical exchange) and team performance (collaborative exchange) contingent on the students’ background and the learning objectives.^[25] Stakeholders furthermore voiced concerns related to how communication issues, collaboration and workflow could be reflected in interprofessional training. This indicates that training elements pertaining to collaborative exchange might be more challenging to design and require different simulation scenarios from the acute setting traditionally used in most healthcare training efforts.^[26,27]

Fostering collaborative exchange in the training session requires some generic principles among the students such as trust and cross-disciplinary knowledge. Our analysis unveiled that communication within the student groups was obscured by a lack of such cross-disciplinary knowledge. On the one hand, medical students’ understanding of nursing and nursing capabilities revealed gaps. Nursing students on the other hand revealed attitudes that distorted their ability to “speak up”. Previous research within simulation-based team training has documented a positive effect of “speaking up” on team performance.^[28]

The issue of “being afraid of each other” as displayed in the study results may refer to traditional patterns of professional roles still prevalent in health care teams,^[29] influencing the participants’ predisposition to communicate freely and share responsibility, both of which are the pillars of teamwork.^[30] Healthcare education must thus ensure that students practice in an environment where they reach their full potential,^[31] meaning that nursing students should be prepared to work in ways that prepare them for clinical decision making and that medical students should increase their knowledge level of nurses’ competencies.

To be able to tailor for these basic principles the role of the facilitators becomes crucial.^[32,33] In our study the Internal Bleeding scenario was facilitated by an experienced emergency medical physician and the Huddle scenario by an experienced surgical care nurse. Uni-professional facilitation might run the risk of protecting already existing role identity and behavior amongst the students. It might therefore be beneficial in future training efforts to test interprofessional facilitator teams (nurse, physician) and their effect on interprofessional communication among students.

4.2 Introducing patient-centered exchange

Introducing patient-centered exchange in interprofessional training implies that participants (students, healthcare staff) would identify with the patient as the center of attention. The patient perspective has received abundant attention in the literature^[34,35] understood communication-wise as lending a voice to the patient and speaking on his/her behalf. In the observed simulation scenarios and debrief sessions patient-centered exchange was not a salient characteristic of the interprofessional communication in the student groups. Although the patient's interests were brought up regularly by the nursing students – and sometimes by the medical students – patient-centered exchange was often latent and partly interwoven in the clinical exchange or the collaborative exchange. One reason for the latent presence of patient-centered exchange in the training session might be that “real” patients were not present in the simulation scenarios. The Internal Bleeding scenario used a manikin while in the Huddle scenario imaginary patients were discussed in the preward round meeting. To better introduce patient-centered exchange as part of interprofessional simulation-based training, the use of standardized patient (SP)/ or role-plays (low-fidelity) including patients should be considered.^[36]

4.3 Contextualising standardized communication tools

While the students in the current study were generally supportive of the standardized SBAR format, the student groups clearly struggled with applying the communication tool to its full extent, suggesting the protocol should be simplified and attuned to the situation at hand. SBAR being developed for structured communication in acute setting^[10] needs to be contextualized to the clinical situation at hand or as one of the students eloquently formulated it: “It depends on the problem”. In fact, some student groups have already embarked on a strategy of SBAR modification during the simulation session.

Furthermore, the attempt to introduce SBAR by providing a brief theoretical introduction with instructions for the students to follow the procedure, failed to encourage use of the communication tool. This suggests that SBAR should be introduced using a more extensive process, preferably by prolonging the training. This finding resonates with the results discussed by McCulloch et al.,^[15] advocating for a higher intensity of training interventions such as the SBAR tool.

4.4 Limitations

Designed as an explorative case study with a limited sample of 48 students and two simulation scenarios, the implications

of this study should be interpreted with caution. Nevertheless, the lack of in-depth knowledge of the student perspective on interprofessional communication warrants the importance of the study results which should form an important basis for broader implementation studies of interprofessional student training.

The use of single uni-professional facilitators in the simulation scenarios and the following debrief sessions might have affected the students' behavior, openness, and opinions of interprofessional communication. For future training efforts we would therefore suggest interprofessional facilitator teams.

In observing the simulation scenarios and the debrief sessions observer bias might have affected the data collected.^[18,20] This was compensated for by using two experienced observers following an agreed-upon observation guide, and by following an extensive collaborative approach amongst three of the authors in analyzing the data.

The students had only one day with simulation-based training in interprofessional communication, meaning that the results could have been different if the training been conducted regularly throughout their study period.

5. CONCLUSION

By observing and analyzing a simulation-based training session for nursing and medical students, we have shown that the interprofessional communication can be characterized using clinical exchange and collaborative exchange. Patient-centered exchange was latent and largely missing in the communication. We surmise that effective interprofessional communication training amongst healthcare students relies on balancing issues of clinical exchange and collaborative exchange and at the same time introducing more traits of patient-centered exchange in the training.

The use of standardized communication tools in interprofessional training seems to be highly related to clinical exchange. Using SBAR in the current study was only partly successful according to the students who requested modifications of the protocol to suit the situation and the complexity at hand.

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Appendix 1:

Focus group interview guide, students in sub-studies 2 and 3 (in Norwegian)

SPØRSMÅLSGUIDE FOR FOKUSGRUPPEINTERVJU: høsten 2011

SPØRSMÅL	
1. Åpningsspørsmål	
a. Icebreaker – bli kjent	
b. Introdusere seg selv	
2. Introduksjonsspørsmål	
a. Hva tenker dere når du hører begrepet tverrprofesjonelt samarbeid?	
3. Overgangsspørsmål	
a. Kan dere fortelle om erfaring med tverrprofesjonelt samarbeid i deres kliniske praksis? Enten egen erfaring, eller der dere har sett andre som har samarbeidet tverrprofesjonelt i deres kliniske praksis som student?	
4. Nøkkelspørsmål	
a. Hvordan ser dere på obligatorisk deltagelse i tverrprofesjonell teamtrening i utdanningen deres	
b. Hvordan ser du på din egen rolle som sykepleierstudent (eller legestudent) i tverrprofesjonelt samarbeidstrening?	
c. Om du skulle lage et treningsprogram i tverrprofesjonelt samarbeid mellom legestudenter og sykepleierstudenter, hva var de viktigste temaene du ville hatt med?	
d. Hva ville du ønsket å lære om?	
e. Hvordan kan det lages et troverdig og brukertilpassa treningsprogram?	
f. Hvordan ser dere på det å lære sammen med andre?	
g. Hva antar du blir din viktigste rolle som nyutdanna sykepleier eller lege i tverrprofesjonelt team?	
h. Hvordan ser du på din rolle som lege/sykepleier i forhold til sykepleier/ lege?	
i. Hvordan tenker dere at teamtrening kan endre holdninger til service og pasientomsorg?	
5. Avslutningsspørsmål	
a. Har vi glemt noe? Er det noe vi ikke har snakket om, som vi burde ha snakket om?	
6. Oppsummeringsspørsmål	
a. Har jeg forstått dere riktig?	
7. Sluttspørsmål	

Appendix 2:

Focus group interview guide, stakeholders in sub-study 3 (in Norwegian)

Spørsmål til stakeholders: leger, sykepleiere, lærere

<p>Hva er din erfaring med veiledning av studenter ift tverrfaglig samarbeid?</p> <ul style="list-style-type: none">• Hva legger du i det?• Hvordan fungerer et godt tverrfaglig samarbeid?•	
<p>Hva mener du er en «dyktig» sykepleier? Hva mener du er en «dyktig» lege?</p>	
<p>Hvordan er en typisk/vanlig previsitt- legevisitt for deg i forhold til:</p> <ul style="list-style-type: none">• Klar rolle og ansvarsfordeling• Struktur• Kommunikasjon mellom lege og sykepleier• Fordeling av arbeidsoppgaver og opplæring• Tid hos pasienten•	
<p>Hvordan synes du utdanningsprogrammet pr i dag har fokus på tverrfaglig samarbeid? Hvordan kan det eventuelt forbedres/endres?</p>	

Appendix 3:

The observation guide applied in sub-study 3 (in Norwegian)

OBSERVASJONER ANGÅENDE TVERRPROFESJONELLT SAMARBEID I KLINISK PRAKSIS, MELLOM LEGER OG SYKEPLEIERE- FOKUS PREVISITT OG LEGEVISITT

HVOR POST:	NÅR DATO: KLOKKESLETT:	HVA PREVISITT- LEGEVISITT- ANNEN TREFFMÅTE
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OBSERVASJON	KOMMENTAR
HVEM ER MED PÅ VISITTEN - PREVISITT (avdelingssykepleier, gruppeleder, student, leger, andre?)	
ARBEIDSFORDELINGEN (samme over tid? Nye personer hele tiden?)	
HVA TEMA TAS OPP PÅ VISITTEN-PREVISITTEN (vitale tegn, medisiner, familiesit, henvisninger med mer)	
ORGANISERING AV VISITT (lang previsitt, i døren til pas, alt inne hos pas, trallen med?)	
KOMMUNIKASJON/HENVENDELSER MELLOM LEGE OG SYKEPLEIER (hvem fører ordet - atmosfære) (SBAR: situasjon, bakgrunn, evaluering, råd)	
FORDELING AV OPPGAVER OG ARBEID ETTERPÅ (samarbeid, oppfølging?)	
HVOR MYE ER DE HOS PASIENTEN	
STRUKTUR – OPPLÆRING FOR NYANSATTE ELLER FOR STUDENTER (hvordan opplever de å gå visitt) SE ETTER GODE MODELLER	

TVERRFAGLIG SAMARBEID -klare mål (effektiv pasient omsorg), felles team identitet, felles forpliktelse, klar rolle og ansvar fordeling, gjensidig avhengighet mellom gruppelemmer og integrasjon i praksis	
SPESIELLE OBSERVASJONER	

Appendix 4:

Statement by the Western Regional Committees for Medical and Health Research
Ethics (Reg.No.2912/2052) (in Norwegian)
The four receipts from the Norwegian Social Science Data Services

Fra: post@helseforskning.etikkom.no [mailto:post@helseforskning.etikkom.no] Sendt:
20. november 2012 11:30
Til: Ingunn Aase <ingunn.aase@uis.no>
Emne: Ikke fremleggingspliktig for REK

Vår ref.nr.: 2012/2052

Kjære Ingunn Aase.

Viser til din fremleggingsvurdering datert 15.11.2012.

Målet med studien er å få frem ny kunnskap om hvordan man på best mulig måte kan øve inn tverrfaglig samarbeid for å utvikle tverrfaglig kommunikasjon og forståelse. Helseforskningsloven gjelder for medisinsk og helsefaglig forskning på mennesker, humant biologisk materiale eller helseopplysninger. Medisinsk og helsefaglig forskning defineres som virksomhet som utføres med vitenskapelig metodikk for å skaffe til veie *ny kunnskap om helse og sykdom*.

Etter min vurdering er ikke formål i denne studien ny kunnskap om helse og sykdom. Studien kan sees på som en naturlig kvalitetsforbedring som en del av helsetjenesten. Slike prosjekter trenger ikke søke REK.

Vær oppmerksom på at siden du skal samle inn personopplysninger så må prosjektet klareres med Datatilsynet/Personvernombudet for forskning

Jeg gjør oppmerksom på at konklusjonen er å anse som veiledende jfr. forvaltningsloven § 11. Dersom du likevel ønsker å søke REK vil søknaden bli behandlet i komitémøte og det vil bli fattet et enkeltvedtak etter forvaltningsloven.

Med vennlig hilsen | Best regards
Øyvind Straume seniorkonsulent

post@helseforskning.etikkom.no

T: 55978497

Regional komité for medisinsk og helsefaglig forskningsetikk
REK vest-Norge (REK vest)
<http://helseforskning.etikkom.no>





Ingunn Aase
Institutt for helsefag
Universitetet i Stavanger
Ullandhaug
4036 STAVANGER

Vår dato: 11.03.2011

Vår ref: 26329 / 3 / JSL

Deres dato:

Deres ref:

KVITTERING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 08.02.2011. Meldingen gjelder prosjektet:

26329
Behandlingsansvarlig
Daglig ansvarlig

The Role of non-technical Skills in Health Education
Universitetet i Stavanger, ved institusjonens overste leder
Ingunn Aase

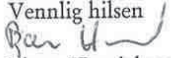
Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://www.nsd.uib.no/personvern/prosjektoversikt.jsp>.

Personvernombudet vil ved prosjektets avslutning, 01.08.2013, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Bjørn Henrichsen


Juni Skjold Lexau

Kontaktperson: Juni Skjold Lexau tlf: 55 58 36 01
Vedlegg: Prosjektvurdering



Ingunn Aase
Institutt for helsefag
Universitetet i Stavanger
Ullandhaug
4036 STAVANGER

Vår dato: 09.11.2011

Vår ref: 28383 / 3 / LT

Deres dato:

Deres ref:

KVITTERING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 10.10.2011. Meldingen gjelder prosjektet:

28383 *Betydningen av tverrprofesjonelt samarbeid; faglig forståelse og holdninger uttrykt av sykepleier- og legestudenter*
Universitetet i Stavanger, ved institusjonens overste leder
Behandlingsansvarlig *Ingunn Aase*
Daglig ansvarlig

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstillter kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://www.nsd.uib.no/personvern/prosjektoversikt.jsp>.

Personvernombudet vil ved prosjektets avslutning, 01.07.2014, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

for
Vigdís Namtvedt Kvalheim

Mlle Mlw he im
Kontaktperson: Lis Tenold tlf: 55 58 33 77
Vedlegg: Prosjektvurdering

Lis Tenold
Lis Tenold



Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Ingunn Aase
Institutt for helsefag
Universitetet i Stavanger
Ullandhaug
4036 STAVANGER

Vår dato: 29.01.2013

Vår ref:32881 / 3 / IB

Deres dato:

Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 21.01.2013. Meldingen gjelder prosjektet:

32881 *Developing a Simulation based pre-graduate Education Module for
Interprofessional Teamwork in Healthcare*
Behandlingsansvarlig *Universitetet i Stavanger, ved institusjonens øverste leder*
Daglig ansvarlig *Ingunn Aase*

Etter gjennomgang av opplysninger gitt i meldeskjemaet og øvrig dokumentasjon, finner vi at prosjektet ikke medfører meldeplikt eller konsesjonsplikt etter personopplysningslovens §§ 31 og 33.

Dersom prosjektopplegget endres i forhold til de opplysninger som ligger til grunn for vår vurdering, skal prosjektet meldes på nytt. Endringsmeldinger gis via et eget skjema, <http://www.nsd.uib.no/personvern/meldeplikt/skjema.html>.

Vedlagt følger vår begrunnelse for hvorfor prosjektet ikke er meldepliktig.

Vennlig hilsen


Atle Alvheim


Inga Brautaset

Kontaktperson: Inga Brautaset tlf: 55 58 26 35
Vedlegg: Prosjektvurdering



Ingunn Aase
Institutt for helsefag
Universitetet i Stavanger
Ullandhaug
4036 STAVANGER

Vår dato: 29.05.2013

Vår ref:34416 / 3 / AMS

Deres dato:

Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 01.05.2013. Meldingen gjelder prosjektet:

34416 *Utvikling av en simuleringsbasert treningsmodul for tverrprofesjonelt samarbeid i helseutdanninger*
Behandlingsansvarlig Universitetet i Stavanger, ved institusjonens øverste leder
Daglig ansvarlig Ingunn Aase

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema <http://www.nsd.uib.no/personvern/meldeplikt/skjema.html>. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://pvo.nsd.no/prosjekt>.

Personvernombudet vil ved prosjektets avslutning, 31.12.2014, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen


Knut Kalgraff Skjåk


Anne-Mette Somby

Anne-Mette Somby tlf: 55 58 24 10
Vedlegg: Prosjektvurdering