Scaffolding Clinical Reasoning of Health Care Students: A Qualitative Exploration of Clinicians' Perceptions on an Interprofessional Obstetric Ward

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ABSTRACT

PURPOSE: Interprofessional education (IPE) on a ward supports students to generate interprofessional patient care plans as a means to learn about the roles, responsibilities, and clinical reasoning of other professions. We investigated how clinicians guide the clinical reasoning of students from their own and other professions and whether clinicians from nursing, midwifery, and medicine could scaffold students from all professions, that is, by providing just-in-time and tailored support.

METHODS: Nine supervising clinicians from medicine, nursing, and midwifery were interviewed and a repeat interview held 3 to 15 weeks later; one nurse supervisor was interviewed only once. Using conventional content analysis, themes were identified inductively. Next, we applied an existing scaffolding framework to conceptualise how clinicians supported the clinical reasoning in an IPE setting.

RESULTS: Themes were clinicians' interventions and intentions, results of interventions and of IPE, characteristics of students and clinicians, interactions between clinicians and students, and logistics. Clinicians applied various interventions and expressed several intentions to guide the learning of students from all professions. Clinicians stimulated students' clinical reasoning by structuring meetings, asking students to explain their thoughts to each other and through giving group assignments. Thus, clinicians used peer-assisted learning for the students. By collaborating with other supervising clinicians regarding the form and amount of guidance to give to the students, clinicians applied peer-assisted learning for themselves as well.

CONCLUSION: Clinicians can learn to scaffold the clinical reasoning of students from different professions, when they are provided with training, good examples, and structures. An existing scaffolding framework can serve as an overview of aims and interventions to provide just-in-time guidance to students from all professions. The scaffolding framework is useful for training clinicians and for depicting the pedagogical approach for IPE wards.

KEYWORDS: Content analysis, interprofessional education on a ward, peer-assisted learning, shared problem-solving, scaffolding clinical reasoning

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Background

Poor collaboration between professional groups in obstetric and maternity care, resulting in serious adverse incidents and endangering patient safety, has been reported by several authors.[1-4] The underlying problem could be identified as miscommunication between professionals who were educated in their professional silos.[5] Interprofessional education (IPE) might reduce these communication problems as students from different health professions learn with, from, and about each other to improve collaboration and the quality of care.[6] Interprofessional training wards are one form of IPE.

Interprofessional ward

Several IPE initiatives take the form of peer-assisted learning with matched companions: students in similar stages of their training, actively helping each other to acquire knowledge and skills in the clinical setting.[7] Students are in charge of the decision-making process, that is, for gathering and presenting the information about the patient in a structured manner.[8,9] Although in an IPE ward, health care students are responsible for pre-selected patients in authentic situations, they need close supervision[10] by a practitioner with oversight of both trainee development and patient care activities, to ensure patient safety

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and quality of care.[11] During rotations, the supervision is usually done by clinicians for students from their own profession. On the IPE ward, we were interested in whether and how clinicians guided students from other professions as well.

Clinical reasoning

Students of all health professions collect and evaluate clinical data necessary to guide patient management decisions, using an analytic approach. This is termed clinical reasoning.[12] Clinical reasoning is essential for the professional practice of all health care professionals and concerns context-relevant decision-making.[13] Blondon et al[14] describe that through a process of collaborative reasoning, clinicians can reach a shared mental model about the patients' problem and how to manage it. Included in the collective process are reasoning to reach a diagnosis as well as patient management, patient monitoring, explaining options to the patient, and team communication.

When students discuss the care plans, the dual processes of clinical reasoning is stimulated: students have to structure their thoughts (analytic process and cognitive level), explain their thoughts to students from other professions, answer their questions, or provide feedback (metacognitive level). Supervisors can set the conditions for the cognitive and metacognitive levels, by asking questions that make all students reflect.[15]

In an earlier study,[8] in a different IPE setting, we found that when students met to devise the interprofessional care plans, clinical reasoning was an important factor in the success of an IPE ward. Students indicated that experiencing the clinical reasoning of other professionals helped them to understand the role of the other professions. Moreover, the students reported that the collaborative clinical reasoning process with other professions helps them to 'put the pieces of the puzzle together' and enhances the interprofessional collaboration.[8] In the same study, clinicians indicated that through the IPE ward, they gained insights into the clinical reasoning of other professions that they had not gained in their 3 years or more working experiences. More specifically, clinicians became aware how they could better align their information to the work processes of other professions.

Scaffolding of learning

Undergraduate students are (relatively) new to the process of professional decision-making. They may perceive the situation of the patient as ill-defined, complex, and changing, making it necessary for clinicians to offer just-in-time and tailored support, which is called scaffolding.[16] The scaffolding metaphor is used to denote the temporary support required to accomplish an educational task that the student could not have performed without the teacher's guidance.[17] Vygotsky[18] used the term 'zone of proximal development' (ZPD) for 'the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers'. In medical education, scaffolding is often related to problem-based learning[19] and inquiry learning[20] as a specific form of support in the classroom situation. In the literature, the concept of scaffolding is usually mentioned for the one-on-one situation of teacher and learner.[21] In this study, we extend the concept to the clinician and multiple students, from the clinician's profession or another, which resonates with Littleton's description of scaffolding in group work.[22] We expect that for clinicians, it might be difficult to be responsive to the learning of students from another profession than their own and enhance the achievement and engagement of students.[22] Given our earlier finding that clinicians were unfamiliar with the clinical reasoning of other professions,[8] the key question is whether clinicians will be able to scaffold the learning of students from professions other than their own and in the setting of a mixed student group.

Therefore, this study aims to explore how clinicians in an IPE ward guide the clinical reasoning process of students from their own and other professions to come to interprofessional care plans and enhance the interprofessional collaboration of the students.

Methods

We applied an exploratory approach to gather information from nursing, midwifery, and medical clinicians who supervised near-final-year students from aforementioned professions. These are students in the third or fourth year of a 4-year training in midwifery and nursing and students in the 5th and 6th year of a 6-year training in medicine.

Our rationale was that the supervisors come to the IPE supervising training with an array of supervising experiences. Therefore, we applied conventional content analysis, a form of open coding, to grasp how clinicians saw their own situation without preconceived categories.[23] The semistructured interview questions pertained to how a supervisor had stimulated interprofessional learning and the clinical reasoning, how the supervisors perceived the effect of their interventions during the meeting and on the ward, and to which degree this student team had made the plan for the patients through interprofessional collaboration.

Setting

This study took place at an Obstetric IPE ward, which started in October 2016 in one large teaching hospital in the Netherlands. Students from nursing, midwifery, and medicine (one in gynaecology and one in paediatric rotation), who were in the later stages of their training, formed interprofessional pairs. During a week, each matched student-pair provided nursing and professional care for two patients selected for them by the nurse supervisor. In the morning meeting, the students were in the lead to present a patient and give input for an interprofessional care plan. Clinicians

from aforementioned professions participated in the morning meetings and took turns in chairing these.

Initially, clinicians from each profession had visited an IPE Obstetric ward in Herning (Denmark) and received an IPE training from a Danish expert after they were back in the Netherlands. Similar to the Danish IPE ward, clinicians adhered to the pedagogy of being in the background and stimulating the students to be active learners.[12] Several elements from the Danish ward were regarded as best practices and replicated in the Dutch setting: (1) a booklet for students containing the relevant telephone numbers, protocols, and the structure of the student team meeting; (2) training sessions for clinicians, (3) a designated room for the students; and (4) 'team-selfies' of students at the end of the week, serving as a 'thermometer' of the team spirit and for easy reference to the memos in the project-coordinators' logbook.

Design

Between December 2016 and September 2017, student team meetings were observed, and clinicians from nursing, midwifery, and medicine were interviewed. Meetings were observed when students from all professions and two or more clinicians were present and at least one clinician was eligible for an interview or a repeat interview. The researcher attended the student team meetings to gain a shared context about the guidance that clinicians gave to students and to follow-up on that during the interviews.[24] The observations and subsequent interviews were conducted 4 days into the IPE week, to ensure that clinicians had had enough time with a team to form a perspective on their functioning. Field notes were made regarding clinicians' interventions, specifically about the types of questions asked. Semi-structured interviews were held with clinicians to gain a deeper understanding of their behaviour, addressing the scaffolding of students' clinical reasoning and any further topics that clinicians raised.[25] Questions pertained to demographics (profession, number of student teams supervised, and number of days supervising this team); grading the IP care plans (results) and the team collaboration (process); the nature, intentions, and results of interventions with respect to clinical reasoning; and the students' interprofessional collaboration and interprofessional clinical reasoning. A repeat interview was held with 9 out of 10 clinicians from 3 to 15 weeks later, using the same procedures. In light of the time lag between the first interview and repeat interview and the more descriptive level that was aimed for, member checking was not performed.[26] Written informed consent was obtained from all participants. Participation in the study was voluntary. Clinicians were informed that participation or nonparticipation would have no consequences for them.

Two researchers observed the first two teams together and held interviews with three clinicians together. After these shared experiences, observations and interviews were undertaken by one of two researchers independently. The researchers decided that sufficiency was reached when no new concepts emerged in three consecutive interviews. This was considered as a justification for determining the number of participants.[27]

Data analysis

To study the phenomenon of scaffolding of clinical reasoning narrated in the interviews, we applied conventional content analysis.[23] Two researchers, both female—C.L.F.V. is educationalist, dietitian by training and A.W. is a postdoc researcher in medical education, psychologist by training—immersed themselves in the data, reading three interview transcripts repeatedly to obtain a sense of the whole. Interview-text fragments that contained relevant information were identified by the two researchers independently; impressions and initial analysis were written and compared. Collecting and analysing data from the interviews was performed concurrently. Labels for themes emerged and were discussed to become the initial coding scheme. Thereafter, each interview was coded by CLFV, and every 5th interview was checked by A.W. After 15 interviews, CLFV grouped themes into categories and discussed these with A.W. To increase credibility, a third researcher who has a medical background and experience with an IPE ward (H.E.W.) checked three interviews and the themes. The new scheme and themes were discussed with the research team and used for the remainder of the interviews and the whole set.[23] After the analysis, the results were compared to an existing framework of scaffolding.[17] The steps are depicted in Figure 1. Ethical approval was granted by the Ethical Review Board of the Netherlands Association for Medical Education, NVMO-ERB (file 780).

Results

Themes

Twelve student team meetings were observed and 19 interviews were held. Ten interviews were with clinicians from Midwifery, 7 from Nursing and 2 with the only physician (the interviews are numbered from 1 to 19). All clinicians were female. Forty themes emerged from the interview data, for example, stimulate input from student's area of expertise; clinicians expect structured patient presentation; checking whether students have prepared together, using the perspective of both professions; improving guidance skills (see Table 1 for themes and more illustrative quotes). The themes could be categorised into characteristics of supervisors ('I delve into the patient situation more consciously than without IPE: her history, how she handles the baby, preparing for discharge . . .' – Nursing S2); clinicians' interventions, such as giving a hint or asking students questions to stimulate input from another profession ('When students ask me a question on the ward, I try to stimulate that they ask the question to a student from another profession. It costs time and I'm still practicing, but my intention is to . . . uh . . . have them consult one another'. – Nursing S7);

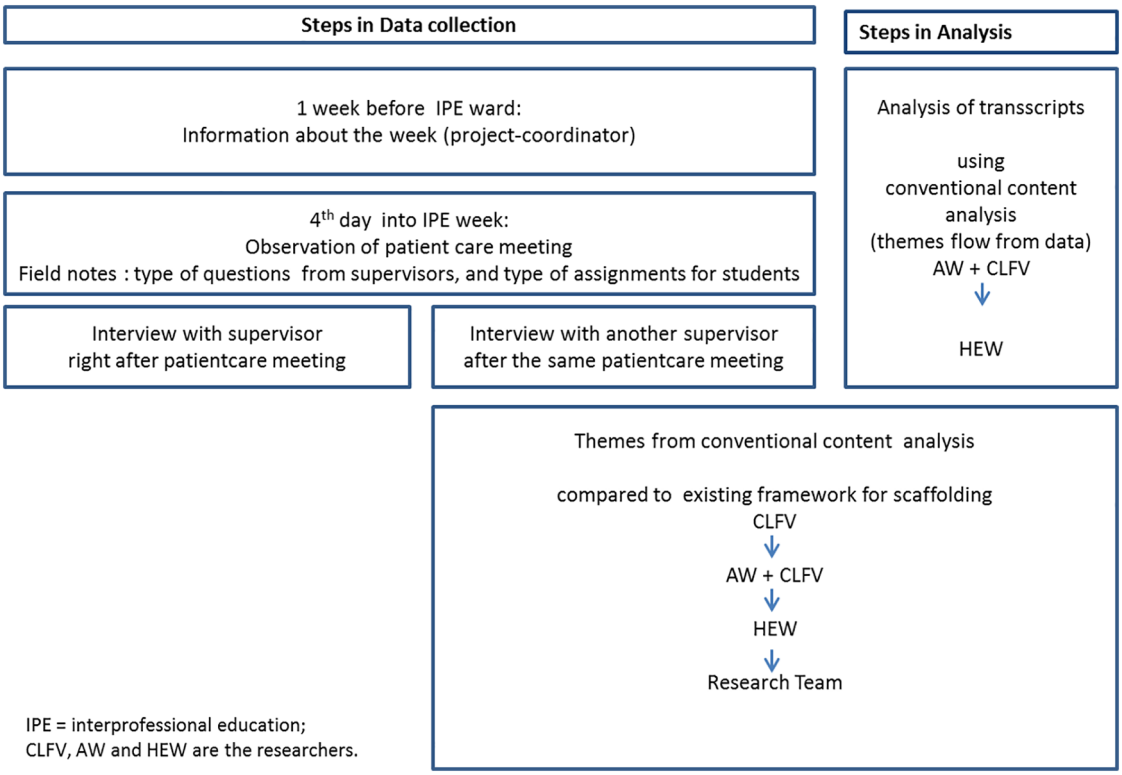

Figure 1. Steps of data collection and analysis.

aim of interventions, which represent intentions, such as checking whether students share knowledge ('Uh, . . . I do check whether they know what they are talking about, not just uh . . . read what is in the patient file. Whether they see the complete picture: the care this patient had before coming to our hospital and what the care will be after her discharge'. – Midwifery S14); results of interventions and of IPE ('I want our patient-care meeting to be educational as well, that we show which information they need to share'. – Midwifery S8); interaction of supervisor and student ('The midwifery student lacks knowledge, I think. But if you help her a bit, she does reach the right answer. . . 'But what underlies everything is that she doubts her career choice, that influences the teamwork as well'. – Physician S1); characteristics of students and logistics (concerning time and continuity in supervising) ('Even the handover from another supervisor about the students is not as good as seeing it yourself. So I ask students which topics have been "on the table"'. – Nursing S13).

Clinicians chaired the student team meetings, giving turns to students to present 'their' patient, providing encouragement to elaborate on clinical problems, asking open questions to the presenter or to students from another profession to clarify or to complete information. Questions were related to symptoms, differential diagnosis, use of protocols and to the patient management plan. We observed that not all clinicians were satisfied with their type of questions to explore students' understanding and their managing of the agenda (4 patient care plans in 1 hour). This led to comments such as: 'This is too long a question' and 'Oh, I'm leading you to the answer' – Midwifery S8. In the first interviews, nursing and midwifery clinicians mentioned to feel more comfortable when the project coordinator chaired the meeting. They perceived the types of questions asked by the project coordinator as good examples of being in the background as a clinician. They expressed to want to imitate her style: '(. . .) I would like more experience with asking questions'. – Midwifery S5. Several weeks into the project, in repeat interviews, these clinicians indicated to be more comfortable asking questions.

In the following paragraphs, we expand on the interventions of clinicians, the clinical reasoning and the effects on students. We conclude the results with the by-effects of the IPE ward.

Clinicians of all professions used teaching aids like baby mannequins, protocols, or schemes in books to interact with students in clarifying elements of obstetrics and maternity care. Several nursing clinicians narrated in the interviews that they provided bedside teaching to all students, either by themselves or they stimulated peer-assisted learning in a student-pair.

Clinicians said they want to offer tailored, just-in-time cognitive support in response to the performance of students. When being in the meeting with a student team for the first time, nursing clinicians found it difficult to diagnose their knowledge levels. 'I don't know what they (do not) know' – Nursing S13.

Clinicians devised different types of assignments for students to delve into a subject (alone or in their pair). For example, 'What are consequences of this Caesarean section on future pregnancies for this patient?' 'What do you need to tell in the discharge procedure?' – Midwifery S3. In the repeat interviews,

Table 1. Findings from the interviews with supervisors.

CATEGORY	THEME	ILLUSTRATIVE QUOTATIONS FROM SUPERVISORS
Supervisor characteristics	Inclined to teach instead of asking questions	• 'This is too long a question' and 'Oh, I'm leading you to the answer.' – Midwifery S12.
	Improving guidance skills	• 'Well, the midwifery supervisor and I discussed how we can prevent the medical student to overwhelm the others. She is very enthusiastic, but that uh . . . the midwifery student has trouble dealing with uh . . . So we noticed that we have to give more structure, so they all can learn.' Nursing S6
	Stimulates students to look for answers themselves	• 'I could teach, but if they look for answers themselves, their learning is more efficient, seeing illustrations and such.' – Midwifery S3
	Supervisor uses illness scripts/pattern recognition	• 'And I notice that I want to check whether we gathered all the information, what else do we need? Which options are there? Instead of using what students bring to the table.' – Physician S1
	Supervisor considers care on maternity ward is more according to protocol than based on clinical reasoning	• 'Most of our patients, . . . well there is not much medically, for clinical reasoning, because most maternity care can be handled with protocols.' – Midwifery S14
	Supervisor's Clinical reasoning skills own knowledge increases	• '. . . Asking more, substantiating the care, is very stimulating.' – Midwifery S4; • 'I like the Clinical reasoning of medical students, it has more depth than ours.' – Midwifery S8
	Considering broader range of options	• 'I delve into the patient situation more consciously than without IPE: her history, how she handles the baby, preparing for discharge . . .' – Nursing S2; • 'I think I incorporate more of the nursing perspective into my own clinical reasoning, or rather: I ask the nurse on the paediatric ward for her ideas.' – Physician S9
	Supervisor expects structured patient presentation	• 'The structure is in our booklet. Yes, we expect structured information from all disciplines, it is common in our work'. – Midwifery S5
	Address lack of conciseness	• 'The medical student in paediatric rotation did not give parameters, I don't think she had an overview, not even when I asked specifics and she had no structure in her presentation of the patient.' – Midwifery S12
Aim of interventions (intensions)	Observing whether students have used protocol	• 'The student pair has discussed the diabetes gravidarum, but they have not yet checked the protocol. They will do that now.' – Midwifery S4
	Stimulating clinical reasoning	• 'That I've elaborated on the CTG [cardiotocograph], to help them think deeper and perform clinical reasoning. I do that on the ward as well, ask them why – why do you need to observe this, etc.' – Nursing S6
	Checking knowledge – about the patient	• 'Uh, . . . I do check whether they know what they are talking about, not just uh . . . read what is in the patient file. Whether they see the complete picture: the care this patient had before coming to our hospital and what the care will be after her discharge'. – Midwifery S14
	Stimulating team collaboration	• 'When students ask me a question on the ward, I try to stimulate that they ask the question to a student from another profession. It costs time and I'm still practicing, but my intention is to . . . uh . . . have them consult one another'. – Nursing S7
	Checking preparation: have student duo prepared together, using perspective of both professions?	• 'With my questions I try to establish whether students have used both perspectives in their preparation of the patient presentation.' – Physician S1
Result of intervention	Lack of knowledge shows	• 'I was surprised that the midwifery student had a wrong idea about what OA [occiput anterior] is. So if I don't ask, I don't know her misinterpretation. And this student team . . . well they do not help each much other in clarifying.' – Midwifery S14
	Importance of knowing the history of patient (before counselling)	• 'I want our patientcare meeting to be educational as well, that we show which information they need to share.' – Midwifery S8
	Team collaboration	• 'I see them going to patients together and they want to learn from each other.' – Physician S9
Interaction supervisor and student	Hesitant student presentation (supervisor's diagnosis of stud performance)	• 'And this student is hesitant in our meeting, about what care to plan. But she is not hesitant on the ward, you know! I find her quite brave there, they consult with each other. [. . .], but I think she does know what to do!' – Nursing S11

(Continued)

Table 1. (Continued)

CATEGORY	THEME	ILLUSTRATIVE QUOTATIONS FROM SUPERVISORS
	Personality of student	• 'This midwifery student is a bit dominated by the over-enthusiastic medical student in their duo, so we have discussed how to handle that.' – Nursing S10
	Student's enthusiasm for IPC	• 'The medical student in gynaecology rotation and the midwifery student, they want to collaborate.' – Physician S1
	Student lacks knowledge, is insecure, therefore knowledge not shown	• 'The midwifery student lacks knowledge, I think. But if you help her a bit, she does reach the right answer. <Is she able to work in an IP way?> She can partly add to an IP care plan. But what underlies everything is that she doubts her career choice, that influences the teamwork as well.' – Physician S1
	Students immerse themselves to understand the situation	• ' . . ., because I have the feeling that I can step back, that they know what needs to be done. It can be entrusted to them.' • Nursing S11 • 'Students present the information from their assignments in the nursing handover in the afternoon – that is good for all involved.' – Nursing S15
Result of IPE	IPE ward brings out clinical reasoning of students	• 'Well, I think that this project gets students involved in, well, clinical reasoning. . . . That the project intends for students to make the next step in clinical reasoning' – Midwifery S16
	Lack of knowledge shows	• 'I see that performing clinical reasoning is, well . . . knowledge is lacking to come to a clear conclusion and policy. And the good part about the IPE ward is – can I mention that now? – that by asking questions to the students, they think about the protocols, about the physiology and they combine this theory into practice.' – Midwifery S16
	Patients see benefits from IPE: more attention, care and students' enthusiasm	• 'And these patients are actually all enthusiastic, they like it. I see it in their encounter. Hey, there they [the students] are! Patients receive extra care and attention, of course. It is a nice interaction between students & patients'. – Nursing S11
Students	Meeting other professions makes students reflect on their own career choices	• 'She [midwifery student] was not selected for medical school [through lottery, Dutch system before 2016]; it could explain why she looked a bit dejected.' – Midwifery S4
	Gain in self-confidence by being in the lead/feeling responsible	• 'That they [students] get to see both the problems and the results, they follow a patient. After a few days they grow in midwifery.' – Midwifery S8
	Students lack the capacity to apply theory to practice	• 'And you notice that in this way, it should be by asking even more open questions, you trigger them to really think how to apply theory . . . to come to a diagnosis'. – Midwifery S16
Logistics	Good selection of patients, relevant for all professions	• 'Discussing the child with dyspnoea.' – Midwifery S8
	Increasing value of internship for students	• 'Having a healthy woman in hospital because of a sick baby, I think that is very informative. Because it is difficult to see the abnormal, when you don't know the normal'. – Midwifery S14
	Supervisor midwifery not on the ward when students report information they have found	• 'So when the students present the results of their assignments in the afternoon, we as midwives are not in the meeting, which I regret.' – Midwifery S3
	Nursing supervisor introduces students and IPE to patients	• 'I tell the patients that I will remain responsible, but the students provide the care.' – Nursing S11
	Fourth day for students is the first or third for the supervisor	• (First day)–'Even the handover from another supervisor about the students is not as good as seeing it yourself. So I ask students which topics have been "on the table".' – Nursing S13 • (Third day)–'When I see them from the first day on, it's easier to see their growth.' – Nursing S13

clinicians indicated they had developed the skill to devise assignments for students to clarify certain aspects in the patient management decisions. For selected issues, the students were encouraged to provide information they had gathered in their assignments to the nursing handover in the afternoon. According to one nursing clinician, this served a double inter-professional effect: the nursing team was informed about maternity care elements from other professions and students became aware which information was not familiar to the nurses (Nursing S11).

Clinical reasoning

We observed that neither the students nor the nursing and midwifery clinicians noticeably used their own profession's model of clinical reasoning as the lead in student team meetings. Clinicians perceived that clinical reasoning was enhanced through providing structure to the student team meeting. This structure clarified how a student was expected to present a patient to the team: which basic information was needed, in a concise manner, before ideas for the decision-making and management of patient problems could be exchanged. The structure for the meeting contained the following: current situation, problem inventory, care plan, interventions, follow-up, and summary.

Effects on students

Clinicians mentioned that they could gradually transfer the responsibility to the student-pair or student, meaning that the scaffolding could fade. Clinicians indicated that students were able to come to interprofessional care plans, as well as to bring extra information to the clinicians and to the team of nurses during the afternoon handovers. Furthermore, they found the student-pair format practical for stimulating peer-assisted learning and asking questions.

Positive by-effects of the IPE ward

Organising IPE is seen as labour intensive, and the experience on this ward was the same. Some characteristics could be seen as positive by-effects:

- Medical students appreciated to learn about the characteristics of healthy babies, a rather unique experience in a hospital.
- While developing the IPE ward booklet, it became clear that protocols for obstetric, paediatric, and neonatal care were not available across these wards. These organisational impediments, known to be hampering IPC, have now been amended for these wards.
- Clinicians reported to have gained insights into pathophysiology, work processes of other professions, and what each profession adds to the patient care.
- Anecdotal information tells us that some clinicians have enhanced the effect of the IPE ward initiative by involving their colleagues in interprofessional learning. Others consider facilitating IPE as an opportunity for career development.

Discussion

This study explored how clinicians from midwifery, medicine, and nursing guide the clinical reasoning of all students on an IPE ward to come to an interprofessional care plan. Stalmeijer et al[28] describe 6 clinical teaching methods: (1) modelling, when the supervisors actively demonstrate and explain skills and procedures to their students; (2) coaching, when the supervisors observe students and provide specific feedback; (3) scaffolding, when the supervisors tailor their support to the knowledge level of the student; (4) articulation, when supervisors stimulate students by asking questions; (5) reflection, when supervisors stimulate students to consider their own strengths and weaknesses; and (6) exploration, when supervisors stimulate students to pursue their individual learning goals. In this study, clinicians applied these six clinical teaching methods, when they tried to determine the understanding of the students from the other professions and offer guidance for tasks beyond a student's abilities. The clinicians indicated that in most student teams, the student-pairs were able to come to interprofessional care plans, thus students took more responsibility and used less guidance at the end of the week. Along with the teaching strategies they applied, the guidance by the clinicians can therefore be qualified as scaffolding.[17]

Clinicians used the structure for the IPE meeting to guide students from all professions and devised assignments to stimulate the students to be active participants. Activating students is important when the learning of clinical reasoning is placed in the light of professional socialisation.[13] Professional socialisation is the professional development of an individual as well as a social process within a group and context. Ajjawi and Higgs indicate a vital role for learners 'modelling their reasoning on that of [. . .] seniors, mentors [. . .] around what the profession demanded from them'.[13] Although we acknowledge that 1 week of IPE is a short period for professional socialisation, it would be interesting to explore in a next study if similar IPE initiatives could lead to interprofessional socialisation, within the interprofessional group and context.

Obstetric wards are considered suitable places for IPE because different professions are involved in the care for the mother and the baby, but not many initiatives were found in the literature.[29] The results show that IP learning took place even though this ward was hindered by the discontinuity of the clinicians. Ideally, the interview with a clinician should be on her fourth day with a student team, but it proved difficult to schedule all clinicians for the whole IPE week. Several clinicians mentioned that this hampered their diagnosis of the ZPD of students. Furthermore, there were not enough nursing students for the IPE ward. When no nursing student was available, a registered nurse took the student role. Clinicians indicated that this influenced the way students collaborated because the other students benefitted from the nurses' work experience. Clinicians also perceived this role was a good opportunity for new nursing staff to become acquainted with the ward.

Meetings which are intended to devise interprofessional patient care plans are sometimes seen as 'a time-efficient way to keep up to date with academic knowledge across professions, but also an opportunity to seek opinions and feedback from others'.[30] This IPE ward provided learning with, from, and about other professions for students as well as for clinicians and to some extent for the nursing staff.

Table 2. Setup of the IPE ward and supervisors enhancing the performance of students of all professions, modelled in a framework for scaffolding.[13]

SETUP ELEMENT OF IPE WARD	SUPERVISORS' SCAFFOLDING OF STUDENTS' META COGNITIVE ACTIVITIES	SUPERVISORS' SCAFFOLDING OF STUDENTS' COGNITIVE ACTIVITIES	SUPERVISORS' SCAFFOLDING OF STUDENTS' AFFECT
Patient care meeting	I: Students use the steps (*cognitive structure*) in reporting about the patient and perform clinical reasoning to come to a care plan M: Structure for the patient care meeting provided in the IPE booklet, pertaining clinical reasoning steps. (*modelling key behaviour*)	I: *Keep students on track* and *build on existing understanding with assignments* when elements of patient care are unknown to students (active learning) M: *Give hints* to activate the thinking within the student duo or student team	I: Enhancing optimal learning situation: *reflections on care and learning*, clinical reasoning of other professions, *every participant in the meeting can ask questions, to build on existing knowledge* M: Supervisors explicate their own learning from the interprofessional exchange (this adds to the *modelling* of interprofessionality and of devising a care plan)
IPE booklet	F: Booklet and other information to students before IPE week –intended for students to get acquainted with the purpose of the ward and the help the booklet could provide	M: *Key points* in Maternity care *indicated* and key points to get students acquainted with a hospital organisation	F: Students can add information of their team: phones numbers, mail-addresses to facilitate communication and group forming
IPE room for students to meet and work on computer	M: Regular modelling of clinical reasoning and interprofessional clinical reasoning during patient care meeting in the morning and afternoon M: Disperse information from students' assignments to nursing team during handover in afternoon – in their presentation to nursing team, *students can implement feedback which was given in the morning*	I: Concentrate on parts within ZPD, instructing for parts beyond: Pre and post talk with students who inform a patient alone (*fading guidance of supervisor*) M: Poster board for selected relevant information (*modelling*)	I: *Supervisor asking about expectations* on the first day M: Informal meeting of students; stimulating students to have lunch together to get acquainted with each other I: Evaluation of IPE experience – *most important principles learned?* M: *Individual feedback session of supervisor and student* F: Make team-selfie during the week

Abbreviations: F, feature of IPE ward; M, means; I, intentions.
Italic text indicates the scaffolding framework from van de Pol et al.[17]

Practical implications

We compared our results to a scaffolding framework[17] which the authors base on strategies mentioned in 66 papers in their review. In this scaffolding framework, Van de Pol et al distinguish 6 intentions in support of students' metacognitive and cognitive activities as well as student's affect. Intentions for scaffolding are to (1) help students keep on track; (2) apply cognitive structures; (3) concentrate on parts within their ZPD while the clinician takes over the parts beyond their ZPD; (4) start with and adhere to a task; (5) build on existing understanding, and (6) control their frustration. Furthermore, there are six means for clinicians to flesh out these intentions: giving feedback, providing hints to activate the groups' thinking, instructing, explaining, modelling of key behaviours, and questioning, that is, asking in such a way that students need to actively formulate a cognitive answer,[17] (see Table 2 text in italic). Comparing the results with the scaffolding framework confirms that the intentions and means of the clinicians on this IPE ward span the width of scaffolding. Through the scaffolding of their clinical reasoning, the student teams could devise interprofessional care plans for patients presenting problems beyond their ZPD and learn about the roles and responsibilities of other professions. The support of the clinicians was not restricted to, for example, modelling or coaching. Clinicians dedicated time and attention to activating the learning of students, both in the set-up of the ward and in stimulating students to investigate parts of obstetric care unknown to them (assignments and feedback) which could be considered articulation.[28]

To illustrate the practical implications for educators who want to implement IPE on a ward, we placed our findings of scaffolding intentions of the clinicians and the means used by them in the framework (Table 2). Using this framework while training clinicians for IPE wards would inform them about interventions, for example, to diagnose the understanding of students as a starting point for the scaffolding of their learning.

The majority of studies on IPE report students' perceptions of the IPE curriculum;[31,32] only a few studies reported on the guidance provided by clinicians. The strength of this study lies in the interpretation of the research with conventional content analysis, in which no preconceived categories are imposed on the information from the participants, aiming to reveal mechanisms. Next, comparing the themes to an existing scaffolding framework made it possible to formulate the pedagogical approach. Our study resulted in a description of the learning-oriented teaching provided by this team of clinicians, including mechanisms on an IPE ward that are vital to enhance the performance of students to come to interprofessional patient care plans, such as modelling in the meeting, asking students to explain their thoughts and giving assignments (Table 2).

A limitation of this study was that we interviewed clinicians from only one teaching hospital and did not interview the students. This generates a new research question: 'how do students perceive the impact of the IPE ward on their clinical reasoning?'. Furthermore, the relative short period (9 months) in which we interviewed the clinicians allowed us to review their growth, but not their full potential, nor the effect of the IPE activities for the ward as a whole.

Conclusions

Clinicians perceived their scaffolding interventions as successful in steering students towards interprofessional clinical reasoning to come to good care plans and pointing out key characteristics of maternity care. For this, the structure for the student team meeting was useful. Giving the students assignments activated their learning, and an extra IPE activity was created by presenting the information to the nursing team.

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Author Contributions

CLFV, AW, GC and RAK contributed to designing the study. CLFV and AW analysed the interviews. All authors contributed to the interpretation of the results. All authors contributed important intellectual content to the paper and approved the final version.

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