

BMJ Open Longitudinal team training programme in a Norwegian surgical ward: a qualitative study of nurses' and physicians' experiences with teamwork skills

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ABSTRACT

Objectives Teamwork and interprofessional team training are fundamental to ensuring the continuity of care and high-quality outcomes for patients in a complex clinical environment. Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) is an evidence-based team training programme intended to facilitate healthcare professionals' teamwork skills. The aim of this study is to describe healthcare professionals' experiences with teamwork in a surgical ward before and during the implementation of a longitudinal interprofessional team training programme.

Design A qualitative descriptive study based on follow-up focus group interviews.

Setting A combined gastrointestinal surgery and urology ward at a hospital division in a Norwegian hospital trust.

Participants A convenience sample of 11 healthcare professionals divided into three professionally based focus groups comprising physicians (n=4), registered nurses (n=4) and certified nursing assistants (n=3).

Interventions The TeamSTEPPS programme was implemented in the surgical ward from May 2016 to June 2017. The team training programme included the three phases: (1) assessment and planning, (2) training and implementation and (3) sustainment.

Results Before implementing the team training programme, healthcare professionals were essentially satisfied with the teamwork skills within the ward. During the implementation of the programme, they experienced that team training led to greater awareness and knowledge of their common teamwork skills. Improved teamwork skills were described in relation to a more systematic interprofessional information exchange, consciousness of leadership-balancing activities and resources, the use of situational monitoring tools and a shared understanding of accountability and transparency.

Conclusions This study suggests that the team training programme provides healthcare professionals with a set of tools and terminology that promotes a common understanding of teamwork, hence affecting behaviour and communication in their daily clinical practice at the surgical ward.

Trial registration number ISRCTN13997367.

Strengths and limitations of this study

- In this study, the sample of both nursing staff and physicians contributes to interprofessional experiences in the implementation of a team training programme in a surgical ward.
- The study intervention was based on an evidence-based team training programme with a standardised curriculum.
- A longitudinal design enables data collection on three occasions.
- The sample size was small, leading to a relatively limited number of participants in the focus group interviews.

INTRODUCTION

Teamwork is fundamental to ensuring the continuity of care and high-quality outcomes for patients in a complex clinical environment, necessitating training across professional silos.^{1,2} Team training has been described as a learning strategy in which a learner or group of learners systematically acquire(s) teamwork knowledge, skills and abilities to impact cognition, affect and behaviours of a team.³ Teamwork is found to positively affect clinical performance.⁴

In hospitals, many adverse events are associated connected to surgery.⁵⁻⁷ A systematic review by Johnston *et al*⁸ documented that a delayed escalation of patient care after surgical complications is associated with higher mortality rates, identifying poor communication, hierarchical barriers and high workloads as causal factors. Previous research has provided evidence for strategies such as team training to improve the surgical culture⁹ and have a positive effect on postoperative patient outcomes.¹⁰⁻¹²

Several team training programmes have been developed in healthcare.¹³ In this paper,

we studied the implementation of the Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) in a surgical ward. TeamSTEPPS is a publicly released, evidence-based programme based on teamwork theory¹⁴ and change theory.¹⁵ The programme was developed by the Agency for Healthcare Research and Quality in collaboration with the US Department of Defense and was released in 2006.^{16 17} TeamSTEPPS, which is transferable to any healthcare setting, intends to facilitate healthcare professionals' teamwork by optimising team structure and the team's communication, leadership, situation monitoring and mutual support skills. The basic assumption of the programme is that these five teamwork principles are critical for safe patient care.¹⁶

Systematic reviews have confirmed that team training affects outcomes related to the team knowledge, attitudes, behaviours of healthcare professionals^{3 18–20} and results in improved quality.³ Furthermore, increased confidence and motivation to apply learned teamwork skills in daily practice have been experienced by healthcare professionals.²¹

Quantitative studies of the TeamSTEPPS programme have confirmed improvements in teamwork and communication,^{22 23} patient safety culture,^{24–27} efficiency inpatient care,^{24 25 28} complications and mortality,²⁹ falls²³ and frequency of wrong-site/side/person surgery.²² Most of the TeamSTEPPS studies are carried out in the USA³⁰ without any longitudinal follow-up, and there are currently only a few qualitative studies¹⁸—for example, in surgical and paediatric intensive care²⁵ and cardiothoracic surgery telemetry.³¹ However, a need persists for qualitative studies in surgical ward settings because the team structure in wards is different from that in intensive care unit (ICU) settings; physicians are not situated in the ward for extended periods, thus restricting the possibilities for interprofessional reflections.³² This study is a part of a larger research project, comprising mainly substudies with a quantitative design, to evaluate an interprofessional team training intervention in a surgical ward.^{33 34} In this context, a qualitative study will provide in-depth knowledge of healthcare professionals' experiences with learned teamwork skills in a longitudinal perspective.

We aimed to describe healthcare professionals' experiences with teamwork in a surgical ward before and during the implementation of a longitudinal interprofessional team training programme. The following research question guided the study: how do healthcare professionals experience teamwork skills communication, leadership, situation monitoring and mutual support before and during the implementation of an interprofessional team training programme?

METHODS

Design

The study used a qualitative descriptive design³⁵ based on semistructured focus group interviews with healthcare professionals at three-time intervals.

Setting

The study was carried out at a 20-bed combined gastrointestinal surgery and urology ward at a hospital division (198 beds) in a Norwegian hospital trust. The surgical ward was selected based on practical issues and the management's interest and motivation for improvement initiatives after experiencing several patient safety incidents. The study occurred from April 2016 to June 2017. At baseline (November 2015 to March 2016), the ward statistics indicated an average bed occupancy rate of 87%, a mean patient length-of-stay value of 3.46 days and an admissions rate of 192.2 patients per month. Moreover, the ward's number of full-time positions was 13 physicians, 17.25 registered nurses (RNs), 4.95 certified nursing assistants (CNAs), 1.0 head nurse and 1.0 clinical nurse specialist.

The patient care was organised into two interprofessional teams, where the primary members were RNs, CNAs and physicians. The composition of the teams and their duties were predetermined by a daily worklist for the nursing staff, while the physicians had their worklist, clarifying weekly duties such as surgery, polyclinic and doctors' rounds.

Sample

A convenience sample³⁶ of 11 healthcare professionals divided into three professionally based focus groups comprising physicians (n=4), RNs (n=4) and CNAs (n=3) were recruited from the surgical ward. The inclusion criterion for participation in the study was that healthcare professionals from the surgical ward had participated at a minimum of 1 day of the interprofessional team training programme (41 participants). The ward management decided which professional groups participated in the TeamSTEPPS training programme. A request for information about the study and researchers was distributed to all healthcare professionals, where 11 confirmed their participation, thus constituting the study sample. The sample comprised eight women and three men with varying work experiences and employment within the ward. To secure the participants' anonymity, no specification of their background is presented.

Team training programme

The longitudinal interprofessional team training programme was planned and implemented according to the TeamSTEPPS-recommended 'model of change' and was organised into three phases¹⁶ (see [table 1](#) and [box 1](#)). A research group initiated the programme as part of a larger research project.³⁴ Two nurses (one leader) and two physicians (leaders) from the surgical ward had the main responsibility for the training and implementation of the programme. Before the training, the four healthcare professionals conducted the TeamSTEPPS V.2.0 Master Training Course and were certified as instructors. A more detailed description of the programme can be found in Aaberg *et al.*³⁷

Table 1 Implementation of tools at phase 2 and phase 3 of the team training programme

Phase 2			Phase 3		
2016	Tools	Implementation arena	2017	Tools	Implementation arena
May	Closed-loop <i>Communication</i>	Exchange of critical information	January	Debriefs <i>Leadership</i>	Once a week— manager with nursing staff
				Task Assistance <i>Mutual support</i>	Distribution of workload
June	ISBAR <i>Communication</i>	Communicating critical information	February	STEP <i>Situation monitoring</i>	Updated in electronic care plan
August	Briefs <i>Leadership</i>	Start of every shift	March	Two-Challenge Rule <i>Mutual support</i>	When an initial assertive statement is ignored
September	Huddles <i>Leadership</i>	At patient safety whiteboard meetings	May	I-PASS <i>Communication</i>	Handoffs with focus on patient safety risks
October	Cross-monitoring <i>Situation monitoring</i>	Double control by intravenous medication administration			

I-PASS, illness severity, patient summary, action list, situation awareness and contingency planning; ISBAR, introduction, situation, background, assessment, recommendation; STEP, status of the patient, team members, environment, progress towards the goal.

Data collection

Ten focus group interviews of healthcare professionals were conducted before the team training implementation

Box 1 Team training programme based on TeamSTEPPS

Phase 1: set the stage and decide what to do—assessment and planning (January 2016–April 2016)

- ▶ Site assessment.
- ▶ A lesson about teamwork in relation to promoting patient safety was conducted with all nurses and physicians to create an awareness of the need for improvement.
- ▶ A training and implementation plan was developed.

Phase 2: making it happen—training and implementation (May 2016–December 2016)

- ▶ One day of interprofessional team training in a simulation centre was completed for all healthcare professionals (n=41) in the surgical ward, comprising 6 hours of classroom training (lectures, videos, role plays and discussions) and 2 hours of high-fidelity simulation.
- ▶ A change team with members from all ward professions and a former patient was assigned.
- ▶ An action plan was established, based on identified patient safety issues in the ward.
- ▶ The TeamSTEPPS tool was systematically implemented every month (see [table 1](#)).

Phase 3: making it stick—sustainment (January 2017–June 2017)

- ▶ The initiatives from the action plan were coached, monitored and integrated.
- ▶ Implementation of a monthly TeamSTEPPS tools continued.
- ▶ Small victories were celebrated.
- ▶ TeamSTEPPS refresher courses were held after four (nurses and physicians) and 11 months (nurses).

TeamSTEPPS, Team Strategies and Tools to Enhance Performance and Patient Safety.

(baseline=T0), with follow-up interviews after 6 months (T1) and 12 months (T2) (see [figure 1](#)).

All the interviews occurred in a meeting room at the hospital during the daytime. A pilot interview was conducted to validate the thematic interview guides developed from a literature review on teamwork (online supplementary files 1 and 2). The interviews were conducted as a dialogue and started with a clarification of the study aim. The thematic interview guides, including the four teamwork skills at T1 and T2, were used to ensure that all themes were explored during each focus group interview. The participants were encouraged to complete an open collective activity with a reflection on common experiences.³⁸ The same questions were posed to all focus groups, and follow-up questions were used to encourage the participants to elaborate and/or clarify their responses.³⁹ One moderator and one observer (who made field notes) were responsible for conducting the interviews, with the third author (AV) as a moderator at T0 and the first author (RB) as a moderator at T1 and T2. At T0, the interview referred to generic questions about teamwork at the ward (see online supplementary file 1); at T1 and T2, the interview questions referred to learned teamwork skills based on the TeamSTEPPS framework (see online supplementary file 2). The field notes were approved by the participants after the interview. The interviews lasted from 25 to 60 min (mean=33 min). All the interviews were digitally recorded, transcribed verbatim and anonymised before the analysis.

Data analysis

Based on the aim and research question of our study focusing on healthcare professionals' experiences with teamwork skills during a team training programme, a

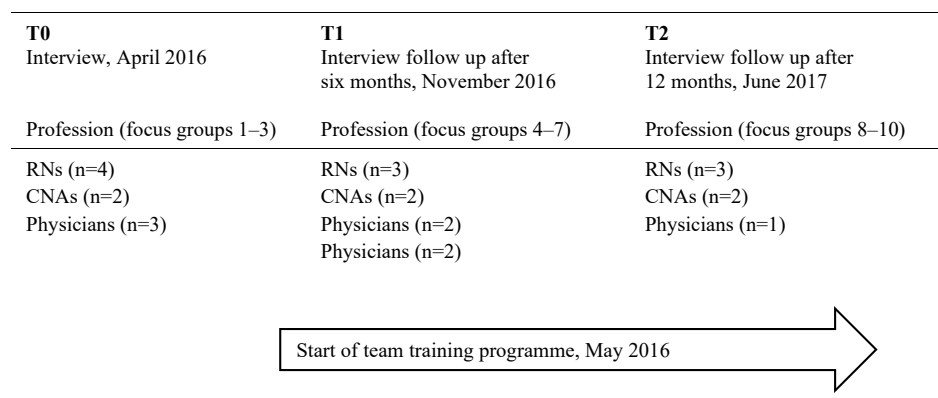


Figure 1 An overview of participants, and times of the interviews in relation to the implementation of a team-training programme; n=11 healthcare professionals (four physicians, four RNs and three CNAs). CNA, certified nursing assistant; RN, registered nurse.

deductive manifest content analysis approach grounded on Elo and Kyngäs⁴⁰ was used. The data were analysed according to the TeamSTEPPS framework,^{41 42} focusing on the four teamwork skills of communication, leadership, situation monitoring and mutual support. The description of the four teamwork skills is shown in table 2.

The analysis process was organised according to three phases: preparation, organising and reporting. The first (RB) and third (AV) authors conducted the first two phases with input from the second author (KA), while all three authors conducted the third phase. In the *preparation phase*, each interview was defined as one unit of analysis, and data from T0, T1 and T2 were analysed separately. All the interviews were read several times by all three authors to become familiar with the data, and, guided by the aim and research questions, the researchers obtained intimate knowledge of the participants' experiences with teamwork skills. In the *organisation phase*, the authors established a structured analysis matrix, with columns representing the categories of communication, leadership, situation monitoring and mutual support. Based on the conceptual description of each TeamSTEPPS teamwork skill in the TeamSTEPPS programme (see table 2),¹⁶ all the data were reviewed for content and coded according to the four teamwork categories (without using any software

tool), first individually by RB and AV, and then together by all three authors until agreement was reached. Examples from the codebook at T1 are shown in table 3. The matrix revealed 514 codes representing the four teamwork categories. In the *reporting phase*, the results were described using the contents of each of the four teamwork categories. Quotations were used to enhance and illuminate the categories.⁴³ To help secure a presentation of results representing the information provided by the participants, continuous discussion among the authors was prominent throughout the reporting phase. Finally, the results were reported according to the Consolidated Criteria for Reporting Qualitative Research (online supplementary file 3).⁴⁴

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Teamwork at T0

The healthcare professionals' experiences of the four teamwork skills in the surgical ward before the team training programme (T0) are described in table 4.

Table 2 Description of the four TeamSTEPPS teamwork skills

Communication	Structured process by which information is clearly and accurately exchanged among team members
Leadership	Ability to maximise the activities of team members by ensuring that team actions are understood, changes in information are shared and team members have the necessary recourses
Situation monitoring	Process of actively scanning and assessing situational elements to gain information or understanding, or to maintain awareness to support team functioning
Mutual support	Ability to anticipate and support team members' needs through accurate knowledge about their responsibilities and workload

Agency for Healthcare Research and Quality. TeamSTEPPS V.2.0: Core Curriculum.¹⁶
TeamSTEPPS, Team Strategies and Tools to Enhance Performance and Patient Safety.

Table 3 Codebook examples from the qualitative deductive content analysis at T1

Communication	Leadership	Situation monitoring	Mutual support
T1:RN,24. Everyone participates using a closed loop.	T1:RN,94. We allocate the tasks now so that they are distributed more evenly.	T1:RN,80. We have become more vigilant about medication administration.	T1:RN,35. When you know the purpose, you have a greater understanding for reporting a second time concern.
T1:CNA,5. On the classroom training day, we learnt to repeat messages—for example, when we take the phone—which is already done.	T1:CNA,36. The ward management is aware that the whiteboard meetings will take place.	T1:CNA,30. The most important thing about the whiteboard meetings is that there is a proper review of patients after the doctor's rounds.	T1:CNA,56. It is not so easy to say so if there is something that we disagree about, compared with when there is something positive.
T1:Ph1,26. Seemed like the nurses were confident about how to present patient information to us.	T1:Ph2,84. If one is to think we are a team, it is natural that the physician who does the round is the leader.	T1:Ph1,69. Whiteboard meetings generate awareness about—for example, safety routines, nutrition, medication administration, etc—that is, such things that are good to check.	T1:Ph,43. It is now easier to ask each other since we know each other better after being in classroom training together.

CNA, certified nursing assistant; Ph, physician; RN, registered nurse.

Teamwork during the 12-month (T1–T2) interprofessional team training programme

A summary of healthcare professionals' experiences with the four teamwork skills during the 12-month team training programme is described in [table 5](#).

Communication, T1–T2

The RNs experienced a common set of tools that promote patient safety. Everyone emphasised the 'closed loop' tool as important to ensure a common understanding within the team. Using the tool, the RNs detected misunderstandings that could have caused consequences for the patient. Both the CNAs and RNs emphasised that, after the 12-month implementation of the team programme, they used the 'closed loop'. They perceived the tool as important, simple to use and promoting patient safety, as exemplified by a CNA:

If there is a phone call and you receive a message then you repeat the message ... to make sure you have got it right—don't you? (T2:CNA,2)

The RNs found it valuable to have a common understanding of communication skills with physicians at the surgical ward. However, they experienced that physicians from other wards, who were not included in the TeamSTEPPS programme, expressed the feeling that the RNs were criticising them when using the 'closed loop'.

During the implementation period, both the physicians and CNAs experienced the RNs as being more confident in their information exchange and found 'introduction, situation, background, assessment, recommendation (ISBAR)' useful when communicating important or critical information over the phone. The RNs experienced the use of 'ISBAR' as somewhat challenging but easier to use when they had enough time. The physicians highlighted that their medical education taught them how to

provide information systematically. However, they became more aware of systematic communication and repeating messages:

Well, I think everyone ... everyone involved has reflected ... and raised one's consciousness regarding it [communication] to a greater extent than if they didn't attend the course. (T2:Ph,11)

With 'ISBAR', it had become more natural for the RNs to take an active part in patient treatment. They referred to common, established expectations toward more active participation, with 'ISBAR' focusing on their perception of the problem and how to handle it. One RN said:

When we call about a deteriorating patient ... I previously thought I shouldn't mention anything regarding my ideas on the causes of deterioration. I always thought that was the physician's task. (T2:RN,13)

The 'handoff' tools for information exchange during shifts had been introduced late and were not properly integrated at the ward. One RN said:

Well, then at least you will need sufficient time to reflect before starting to use them [tools]... and that is not always the case, right. (T2:RN,45)

Even though it is an easy ... an easy tool, I actually think it is one of the hardest as well. (T2:RN,46)

Leadership, T1–T2

The RNs experienced that TeamSTEPPS had led to an increased awareness in using 'huddling' and 'briefing' at the patient safety whiteboard meetings. One RN explained:

We use huddling at the patient safety whiteboard meetings regarding the redistribution of tasks if

Table 4 Teamwork skills at T0**Teamwork skills categories**

Communication	All healthcare professionals were mostly satisfied with the information exchange within the ward, with the nurse team leader possessing a central position. A busy schedule allowed the RNs, who often had patient responsibility within both teams, to acquire patient information in different ways, from participation in regular team meetings to ad-hoc meetings with the team leaders. The CNAs appreciated the 'quiet handover' used between shifts. When calling up the physicians on duty, the RNs often checked the phone list ahead of the phone call to be prepared, indicating that some physicians needed to have more background information than others. The physicians also emphasised the importance of proper and relevant information from the RNs who can be trusted.
Leadership	The two core teams each had a team leader throughout the week, allowing the team leader to become better acquainted with a patient's medical history and thereby increasing continuity and simplifying the hospital discharge. Not all of the RNs enjoyed being team leaders due to a heavy workload; however, the physicians were satisfied with the arrangement.
Situation monitoring	The physicians became familiar with the patients during rounds and through the patient's medical record, mostly discussing patient-related issues in physicians' meetings. Similarly, the RNs discussed issues related to patients' care in nurse meetings, although this may also have resulted in contact with the physicians. Both RNs and CNAs had an active role in the observation of the patients and updating each patient's care plan, and they were encouraged to stay bedside during the rounds. The Modified Early Warning Score (MEWS)* was recently applied, and the physicians were pleased with the new routines, which was highlighted as an excellent tool to quickly determine the degree of illness of a patient. Moreover, the ward was in the initial phase of using a patient safety whiteboard; thus, these meetings did not work optimally with a frequent absence of physicians.
Mutual support	The RNs and CNAs stated that they were flexible in helping each other in the event of an uneven distribution of work, both within the team and between the teams. However, the teamwork was dependent on openness and that team members spoke out when they needed help. They felt listened to and respected by the physicians. All three healthcare professionals groups stated that knowing each other and having fun together strengthened a good working environment and good teamwork. The physicians highlighted that, for the best interest of the patient, good teamwork requires nurses with medical knowledge, clinical experience and continuity with the patient. Nonetheless, the RNs experienced that they did not always have the expected response from the physicians, and the physicians stressed that a large workload requires prioritisation of multiple issues at one time, which may affect the teamwork. According to the RNs, this rarely causes conflicts among healthcare professionals in the ward. Nevertheless, there have been real conflicts, and some have been perceived as a personal attack.

*MEWS is a tool for bedside evaluation of the systolic blood pressure, pulse rate, respiratory rate, temperature and Alert, Reacting to Voice, Reacting to Pain, Unresponsive score.⁵⁷
 CNA, certified nursing assistant; RN, registered nurse.

anyone feels they have too much work, while others have available capacity. (T2:RN,58)

The redistribution of work tasks resulted in a more even workload between the two core teams at the ward.

At T1, the mid-day nurse meeting was led by the RN team leaders, whereas the physicians initially led the interprofessional patient safety whiteboard meetings. The RNs experienced it as natural that the physicians led the meetings whenever they were present. However, at T2, the mid-day nurse meeting was replaced with the interprofessional patient safety whiteboard meeting, led by the RN team leader. The physicians could not always attend the patient safety whiteboard meeting due to activities in the operating theatre, being called for and so on. While whiteboard meetings occurred daily, the weekly 'debriefing' occurred on Fridays. The ward head nurse usually led the 'debriefing', which was experienced as useful, as exemplified by a CNA:

It is good to talk things through, expressing issues that are on your mind when it has been a busy week ... also experiencing that debriefing can be fundamental for change. (T3:CNA,30)

The physicians were more uncertain whether the team training programme had led to an increased awareness of team leadership.

Situation monitoring, T1–T2

The use of the term 'situation monitoring' was new for healthcare professionals. The RNs realised that they had always monitored the work system without being aware of the term. By using the tools, they detected patient safety incidents that could have resulted in unnecessary harm to the patients. Cross-monitoring of the intravenous medication administration had been implemented. The RNs experienced the use of situation monitoring skills depended on their role in the team. As team leaders, they

Table 5 Experiences with teamwork skills at T1 and T2 of the team training programme

Categories	T1 (6 months)	T2 (12 months)
Communication	Increased awareness in using the closed loop and ISBAR tools.	* -----→
	Challenges with using ISBAR when communicating critical information (RNs).	RNs are more confident in information exchange using ISBAR. ISBAR forms a basis for a more active role for RNs in decision-making. Challenges still exist when using ISBAR during busy shifts.
	The included tools are seen as a common initiative to promote patient safety.	-----→ Misunderstandings in work practice are discovered when using the tools. The tools provide information in a more systematic manner. Handoff not properly incorporated.
Leadership	Distribution of work tasks using huddling.	-----→
	RN team leader runs the mid-day nurse meeting.	Mid-day nurse meeting replaced with patient safety whiteboard meeting.
	Physician runs the interprofessional patient safety whiteboard meeting when present, otherwise an RN.	RN runs the interprofessional patient safety whiteboard meetings. Head nurse runs the Friday debriefing, evaluating the weekly activities.
Situation monitoring	Double control in intravenous medication administration using cross-monitoring.	-----→
	Risk assessment at whiteboard meetings provides awareness of new and/or important patient issues.	Risk assessment at interprofessional patient safety whiteboard meetings established on weekdays, challenges on weekends.
	Nursing plans less prioritised due to patient safety whiteboard meetings. MEWS prioritised.	-----→ MEWS a well-established routine.
Mutual support	Transparency and openness across the healthcare team.	-----→
	Legitimate to express safety concerns.	-----→
	Use of the Two-Challenge Rule to resolve disagreements.	-----→ Increased awareness of speaking up for the patients. Increased awareness of giving and receiving feedback.

*The arrow expresses continuity in healthcare professionals' experiences throughout T1 and T2.

CNA, certified nursing assistant; ISBAR, introduction, situation, background, assessment, recommendation; MEWS, Modified Early Warning Score; RN, registered nurse.

had to scan what was going on at the ward; however, if they were situated inside the patient room, they lost sight of other ongoing issues.

Six months into the team training programme, healthcare professionals experienced a better functioning of the patient safety whiteboard meetings, though still not optimal because physicians did not always attend. After 12 months, everyone experienced the meeting as a useful and well-established arena to monitor patient risks. They

also experienced that the meeting created an awareness of tasks that needed attention, as described by a physician:

Yes, fall prevention, nutrition, medication reconciliation. Well, that's the type of issue that ... it's convenient to check, reminding us of issues that need attention. (T1:Ph,69)

Despite the benefit of the whiteboard meetings, they were not prioritised on busy shifts during the weekends.

Both the RNs and CNAs were responsible for updating the patient safety whiteboard according to their patients' needs and realised that the increased whiteboard focus negatively affected the updating of the nursing plans.

During the team training programme, the 'Modified Early Warning Score (MEWS)' became a well-established and systematic routine appreciated by all healthcare professionals. Nevertheless, the physicians experienced that some nurses did not relate the 'MEWS' measurements to the patient's condition, only using 'MEWS' as a recipe. Some experienced that the RNs called them without getting into the patient's anamnesis from the medical record seen as their common information exchange system. It was expected that both RNs and CNAs scored their patients with 'MEWS' and exchanged the results with the team leader. They now measured the patient's pulse and blood pressure more frequently, although it was described that the parameters might be overlooked, as pointed out by one CNA:

Well, it is worth mentioning regarding MEWS that people tend to forget to measure the pulse themselves. They see the number and then refer to this ... without acknowledging that the pulse can be as irregular and deviating as ever. (T2:CNA,47)

Mutual support, T1–T2

The RNs perceived mutual support to the teamwork skill creating the most influential changes at the ward, also considered the most effective to implement. At T1, RNs experienced increased transparency and openness across the healthcare team. Colleagues raised problems more directly. It became more legitimate to express concerns and speak up because the contents could be addressed in relation to the tools and strategies of the training programme. With a common understanding in place, it was easier to use a tool such as the 'Two-Challenge Rule'. A physician referred to an episode, where the RN disagreed with him and used the tool:

There was a patient with ... urine retention with 300 mL of residual urine and you are not supposed to send them home without a catheter ... but on that occasion I meant that we could do so. And she [RN] was absolutely right in her judgment ... there are routines for not having that much [residual urine], and since I thought it was right I tried to explain it. (T1:Ph,61)

Moreover:

It was, of course, ok, she did what she was supposed to do and it is commendable that they raise it, that they are not afraid of voicing it. (T1:Ph,62)

The physicians emphasised that it became easier to collaborate on patient treatment with mutual and open communication, and they felt that the team programme had impacted this. At T2, the 'Two-Challenge Rule' was

used frequently, a strategy they probably used prior to the programme, but as an RN expressed it:

Yes we did it [open communication, Two-Challenge Rule] ... it was just that we did not have a notion for it. (T2:RN,40)

Hence, increased awareness of using different mutual support tools had been created:

You don't accept the response you are given; you rather rephrase the question once or twice if necessary. (T2:RN,102)

Both the RNs and CNAs had become more aware of the importance of feedback. They evaluated the tools as useful when adverse events occurred and, in that context, experienced a high degree of support across the inter-professional team. They experienced colleagues being less concerned with raising issues through feedback, and, according to RNs, the 'go to the leader' mentality when dissatisfied was less prominent. The RNs had also seen inexperienced RNs who now dared to speak up for the patient. However, they still felt that healthcare professionals held back on different occasions, implying a continued room for improvement within giving and receiving feedback.

DISCUSSION

We aimed to describe healthcare professionals' experiences with teamwork in a surgical ward before and during the implementation of a longitudinal inter-professional team training programme. The results described that RNs, CNAs and physicians were highly satisfied with the teamwork at the ward before the team training programme. Nevertheless, they experienced that the implementation of the programme, where they were trained together, led to greater awareness and knowledge of their common teamwork skills. Changes were described related to more systematic information exchange, increased consciousness of team leadership balancing activities and resources, increased use of situation monitoring tools and a common understanding of accountability and transparency.

Communication: towards a systematic information exchange

When RNs used the communication tool 'ISBAR', the physicians experienced a more systematic exchange of patient information, which was highly appreciated. The RNs experiencing challenges using the tool in the first phase and eventually became more confident. This finding is in accordance with results from a study in surgical wards, where both nurses and physicians perceived 'ISBAR' as effective in obtaining a structure of the contents of patient reports.⁴⁵ Nurses and physicians traditionally communicate using different styles appropriate to the needs and processes of their respective professions.^{46 47} This gap may be bridged using 'ISBAR', establishing a common communication style. Hierarchical culture has been experienced by nurses as having

a negative effect on interactions with some physicians.³¹ According to De Meester *et al*,⁴⁸ the use of 'ISBAR' may flatten the hierarchical structure by nurses experiencing being empowered, thereby resulting in more effective communication channels. The RNs in our study referred to a positive change with expectations towards more active participation in patient decision-making. Open communication with a common language of how to present key patient information can prevent misunderstandings and communication failures.⁴⁹ Interprofessional teamwork is generally found to motivate and empower staff when team members feel their roles are acknowledged.⁵⁰

Leadership: balancing activities and resources

Leadership was seen as an essential teamwork skill to increase the continuity of patient care, with an even distribution of work tasks and debriefing as essential activities. According to Salas *et al*,¹⁴ team leadership coordinates and organises team members' activities. Considering that the team leader possesses knowledge of team resources,⁵¹ they have the opportunity to 'balance the workload within the team'.¹⁶ In this study, the redistribution of work tasks was completed at the daily patient safety whiteboard meeting led by the RN team leader. At these meetings, the use of the tool 'huddling' was implemented and found useful when balancing work tasks within and between the two ward teams—the intention using huddles.¹⁶ The leader's overview of team activities is essential, with the weekly debriefing meeting described as 'fundamental for change' due to the opportunity for healthcare professionals to share their experiences related to patient care as a basis for improvement in procedures or work routines.

Situation monitoring: towards a conscious use of tools and interprofessional meetings

Our study confirmed that using the term 'situation monitoring' was new for healthcare professionals at the surgical ward, although they realised they had previously used the skill unconsciously. According to Benner,⁵² knowledge development in healthcare consists of spreading practical knowledge and the mapping of existing practical knowledge developed through clinical experience, to which the team training programme may have contributed. RNs, CNAs and physicians all experienced increased attention towards situation monitoring skills throughout the use of MEWS, as well as at the daily interprofessional patient safety whiteboard meetings established during the team training programme period. These meetings were experienced as useful opportunities to monitor patients and create an awareness of necessary tasks. This finding is in accordance with Sehgal *et al*,⁵³ where nurses were seen as responsible for accurate and updated information on whiteboards, whereas the goals for the day should be created jointly by nurses and physicians. The physicians in the current study appreciated that the nursing staff referred to MEWS when calling them. Early warning scores are known to have a good prognostic value for patient deterioration and have been shown to improve

patient outcomes, partly because they facilitate communication among healthcare professionals.⁵⁴ Like the physicians, the nurses also saw the importance of gathering the MEWS but also emphasising the importance of using their clinical eye and mind. In their integrative review, Massey *et al*⁵⁵ found that assessing and knowing the patient, nurse education and the use of specialised equipment were all factors with an impact on ward nurses' ability to recognise patient deterioration.

Mutual support: towards accountability and transparency

In our study, mutual support was considered the most effective teamwork skill to implement and, according to the RNs, contributed to the most comprehensive positive change at the ward during the team training programme. This was despite healthcare professionals referring to a ward culture with open communication, including before the training programme. Mayer *et al*²⁵ found that, by using pre-implementation and post implementation interviews of staff in surgical ICUs, the informants described an overall improved mutual support with a more positive team morale across physicians and nurses post implementation. In a qualitative study conducted by Baik and Zierler,³¹ the nurses reported improved changes in interprofessional relationships and being more satisfied with their work because they felt included as a member of an interprofessional team training intervention. In our study, both physicians and nurses experienced that when having a common understanding, it was easier to use tools such as the 'Two-Challenge Rule'. Both RNs and CNAs described that they had become more aware of giving each other feedback. When adverse events occurred, they experienced a high degree of support across the interprofessional team, a situation that is in accordance with Weller *et al*,⁵⁶ who interviewed a surgical team in an operating room and described a positive change in information sharing and improved confidence, as well as a greater awareness of the other team members and working environment, after conducting a simulation-based team training programme.

Limitations

There are several limitations in our study that need to be recognised. The results may be influenced by the relatively limited number of participants in each of the focus group interviews and a possible bias in the sample of participants based on possible positive perceptions of teamwork at the surgical ward. The study is not suitable for generalisation; however, the results based on our qualitative design provide a deeper understanding of the health professionals' experiences with learned teamwork skills that may be relevant at other hospital wards. Due to time pressure and workload in their daily practice at the surgical ward, the healthcare professionals had to repeatedly change their interview times, which may have affected the results. Two groups of two physicians participated in the interviews after 6 months, whereas only one physician had the opportunity to participate after 12 months.

A larger group of physicians might have provided other experiences with the teamwork skills that may also impact the results because mostly the nursing staff attended the refresher courses. The results may also be influenced by the patient safety initiatives recently initiated at the ward ahead of the team training programme, such as the MEWS and patient safety whiteboard meetings.

CONCLUSION

Our study suggests that, during a team training programme, healthcare professionals were provided with a set of tools and terminology that promoted a common understanding of teamwork, hence affecting behaviour and communication in their daily clinical practice at a surgical ward. The findings contribute to the qualitative evidence base of the implementation of team training programmes. More specifically, the study documented the role of a systematic information exchange, a consciousness of leadership and situation monitoring skills and the importance of creating a culture of accountability and transparency in a surgical ward. Further research should study the effect of the implementation of the TeamSTEPPS programme in hospitals, including various departments. Moreover, a study on the long-term sustainability of team training programmes on healthcare professionals' behaviour is necessary.

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Ethics approval The study was approved by the Norwegian Center for Research Data (Ref. 46872) and permission was given by the head administration in the participating hospitals. The Committee for Medical and Health Research Ethics of South-East Norway reviewed the study (Ref. 2016/78) and responded that approval was not necessary according to Norwegian law, since the study did not involve patients. Information and an invitation to participate in the study were given to healthcare professionals in written and verbal forms, referring to the principle of autonomy addressed by confidentiality and voluntariness. Written consent was obtained from the healthcare professionals who agreed to participate. The study was conducted in accordance with the principles of the Declaration of Helsinki.

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