Interprofessional Team Training at the Prelicensure Level: A Review of the Literature

Sioban Nelson, RN, PhD, FCAHS, Catriona F. White, RN, Brian D. Hodges, MEd, PhD, MD, FRCPC, and Maria Tassone, MSc, BScPT

Abstract

Purpose

The authors undertook a descriptive analysis review to gain a better understanding of the various approaches to and outcomes of team training initiatives in prelicensure curricula since 2000.

Method

In July and August 2014, the authors searched the MEDLINE, PsychINFO, Embase, Business Source Premier, and CINAHL databases to identify evaluative studies of team training programs’ effects on the team knowledge, communication, and skills of prelicensure students published from 2000 to August 2014. The authors identified 2,568 articles, with 17 studies meeting the selection criteria for full text review.

Results

The most common study designs were single-group, pre/posttest studies (n = 7), followed by randomized controlled or comparison trials (n = 6). The Situation, Background, Assessment, Recommendation communication tool (n = 5); crisis resource management principles (n = 6); and high-fidelity simulation (n = 4) were the most common curriculum bases used. Over half of the studies (n = 9) performed training with students from more than one health professions program. All but three used team performance assessments, with most (n = 8) using observed behavior checklists created for that specific study. The majority of studies (n = 16) found improvements in team knowledge, communication, and skills.

Conclusions

Team training appears effective in improving team knowledge, communication, and skills in prelicensure learners. Continued exploration of the best method of team training is necessary to determine the most effective way to move forward in prelicensure interprofessional team education.

In 2000, To Err Is Human, a report released by the Institute of Medicine (IOM), shed a spotlight on patient safety with the declaration that 70% of adverse events in health care were actually preventable.\(^1\) The IOM argued that these adverse events were often caused by the fragmented way care was being delivered and, moreover, that this fragmentation of care was in itself preventing improvements to patient safety.\(^1\) Subsequent work has continued to validate this claim, demonstrating that failures in team communication are associated with patient safety incidents.\(^2\) Over a decade on from the IOM report, it is widely accepted that interprofessional care is a critical intervention to promote quality of care; improved health outcomes; and an efficient, cost-effective model of health care.\(^3\) At the same time, many argue that issues of hierarchy and the disconnect between professions are significant barriers to patient safety and that professions need to change how they work with and relate to each other before they can work in effective, collaborative teams.\(^9,10\)

According to the Canadian Patient Safety Institute, an effective team is one whose members have mutual trust and commitment as well as team skills and knowledge, including team leadership skills, an understanding of roles within the team, conflict management skills, the ability to reflect and reassess team performance, communication skills, adaptability, and the ability to coordinate within a team without overt communication.\(^2\) Other industries, most notably aviation, have had success with programs geared specifically toward teaching team knowledge and developing these team skills.\(^11,12\) This focused training on teamwork, or team training, has been found to improve team performance outcomes and health care providers’ effectiveness at the postlicensure level.\(^13-17\)

There is a broad consensus among educators and professional bodies that interprofessional team training needs to be implemented at the prelicensure level,\(^4\) and that the isolation of health professions during their education is a contributing factor to the fragmented culture of the health system.\(^8\) The Canadian Patient Safety Institute calls on health care practitioners to be able to work in teams and communicate effectively;\(^2\) but those competencies are not realistic if relevant interprofessional education is not provided while future health care providers, including doctors, nurses, respiratory therapists, physiotherapists, social workers, and other allied health professions, are still developing their professional identities.\(^9,18\) And while prelicensure interprofessional education is being implemented all across the United States and Canada,\(^6\) interprofessional education curricula do not always include specific team training components.

We undertook this descriptive analysis review to gain a better understanding of the various approaches to and outcomes of team training initiatives in prelicensure curricula since 2000 when To Err Is Human shed light on the patient safety issues that the lack of cohesive interprofessional care caused. We paid particular attention to the nature of the training and the assessment methods employed, guided by the following questions:

Please see the end of this article for information about the authors.

Correspondence should be addressed to Catriona F. White, Simcoe Hall—Room 224, 27 King’s College Cir., Toronto, ON M5S 1A1, Canada; telephone: (416) 978-2122; e-mail: catriona.white@uhn.ca.

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1. What team training interventions and/or teaching methods have been used to teach team knowledge, communication, and skills at the prelicensure level?

2. What has the team composition been in these team training interventions and/or teaching methods?

3. How were these team training interventions and/or teaching methods assessed?

4. Have these team training interventions and/or teaching methods shown any indication of being effective at teaching team knowledge, communication, and skills at the prelicensure level?

Method

Data sources and selection criteria

Using the MEDLINE, PsycINFO, Embase, Business Source Premier, and CINAHL databases, we searched using the keywords curriculum, prelicensure, prequalification, and students (including medical, nursing, social work, pharmacy, occupational therapy, physical therapy, business, and emergency services) combined with team training, team building, teamwork, crisis resource management (CRM), TeamSTEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety), team communication training, and related terms in June 2014. Note that interprofessional education proved too broad a search term, so we narrowed our focus to elicit articles that specified team-based training. We included uniprofessional studies that referenced team training and performed a hand search of the references of retrieved articles for other eligible articles.

This review includes English-language, peer-reviewed, evaluative studies of team training programs’ effects on the team knowledge, communication, and skills of prelicensure students published from 2000 to August 2014. We included only articles in which students were enrolled in a program that prepared them for a program that prepared them for a health professions program. Eight studies (n = 20,21,22,25–27,29–31,34,35) included video examples (n = 4)21,32,33,35 and computerized presentations (n = 1).24

Many of the studies also used active learning methods such as role-play (n = 6),20,23,25,30,36 problem-solving activities (n = 2),23,25 nonmedical team-building activities (n = 2),22,23 and case studies (n = 2).20,23 All but 1 study22 used some sort of simulation as both a teaching method and/or an evaluative opportunity. Simulations included mannequin simulations (n = 6)20,23,24,26,27,34 and standardized patient simulation (n = 5).21,25–28 with the remaining studies not providing details on the type of simulation used. Small-group discussions and debriefings after some activities were also used in many of the studies (n = 10).21,22,26,27,29–31,34

The most common curriculum bases were the Situation, Background, Assessment, Recommendation (SBAR) communication tool (n = 5)20,30,32–34,36 and high-fidelity simulation (n = 4).26,27,34,36 Additional information on the curriculum basis, team-based competencies assessed, outcomes, and methodological quality of each study is outlined in Table 1.

Results

Study designs and locations

Among the 17 studies we identified,20–36 the most common study designs were single-group, pre/posttest studies (n = 7),21,25–27,30–32 followed by randomized controlled or comparison trials (n = 6).23,24,28–30,32 There was also 1 single-group, posttest study25; 1 retrospective inquiry21; and 4 two-group, nonrandomized trials.20,21,31,36 One study1 employed both a single-group, pre/posttest study and a two-group, nonrandomized trial as it repeated the intervention with another cohort. Another study30 performed their assessment of skills and knowledge as a single-group, posttest study but used a single-group, pre/posttest study to determine changes in attitudes and self-assessed skills. Just under half of the studies (n = 8)20,21,22,25,28,33,36 also reported results from self-assessments performed by the participants, which covered topics such as attitudes, self-efficacy, training satisfaction, qualitative comments, and self-reported use of the learned skills in clinical situations. Most studies came from the United States (n = 12),20,22,24,31,34,35 with the remainder coming from Canada (n = 2),21,36 Australia (n = 2),32,33 and Germany (n = 1).23

Team training interventions and/or teaching methods

Didactic lectures were used in 12 studies,20,21,22,25–26,28–31,33,36 with Hobgood et al23 also using an interactive lecture format. Other forms of didactic learning included video examples (n = 4)31,32,33,35 and computerized presentations (n = 1).24

Participants

Just over half of the studies (n = 9)20,22,25–29,34,36 performed training with students from more than one type of health professions program. Eight studies20,21,22,25,26,27,29–31,34,36 used uniprofessional teams; of those teams, the majority consisted of medical students (n = 5)21,22,25,30,31 and nursing student teams accounted for the rest (n = 3).20,30,31 In addition, of the uniprofessional studies, only three20,21,33 discussed working in interprofessional teams. Most of the participants in the studies were medical students (n = 13)21,23,25–29,32–34 and/or nursing students (n = 11).20,25,31,34,36 There were also a few studies involving nurse anesthetist (n = 3),26,27,34 respiratory therapy (n = 2),26,36 physical therapy (n = 1),23 and social work students (n = 1).23 Di Prospero and Bhimji-Hewitt22 used a sample of students from medical laboratory science, ultrasound,
medical radiation science (nuclear medicine, radiological technology, and radiation therapy), chiropody, and cardiovascular perfusion programs, and Fernandez et al.\textsuperscript{24} studied emergency medicine residents as well as medical students.

Assessment measures and outcomes

All but three studies\textsuperscript{21,25,35} used team performance assessments. Many of those assessments were measured with observed behavior checklists that were created for that specific study (n = 8).\textsuperscript{20,23,24,30–33,36} Of those measures, three\textsuperscript{23,24,36} were validated, either externally or internally. The main purpose of Sigalet et al.’s\textsuperscript{16} study was to create and validate the KidSIM Team Performance Scale, which was developed from the Mayo High Performance Teamwork Scale (MHPTS) and Clinical Teamwork Scale. Other studies (n = 6)\textsuperscript{22,26–28,34} that used team performance assessments used previously created and validated observed behavior checklists or variations of them. These included the Communication and Teamwork Skills Assessment (n = 2),\textsuperscript{26,27} MHPTS (n = 3),\textsuperscript{26–28} Anesthetists’ Non-Technical Skills (n = 1),\textsuperscript{29} and modifications of the Operating Room Teamwork Assessment Scales (n = 3).\textsuperscript{26,27,34} Di Prospero and Bhimji-Hewitt\textsuperscript{22} did not use a scale for team performance assessment but relied on retrospective feedback and reflection by facilitators and students to provide a qualitative assessment.

Five studies\textsuperscript{21,25,28,30,35} assessed participants’ knowledge of teamwork principles. Cahan et al.\textsuperscript{21} assessed knowledge by having students answer how they would react in a situation of interprofessional conflict. Fulmer et al.\textsuperscript{25} assessed students using a case study test of geriatric interdisciplinary care planning knowledge, and by measuring students’ success in pointing out ineffective team behaviors in video sketches. The remaining three studies\textsuperscript{24,30,35} used written knowledge tests. Both Hobgood et al.\textsuperscript{28} and Kesten\textsuperscript{30} created the knowledge tests for their study, while Robertson et al.\textsuperscript{35} used Hobgood et al.’s\textsuperscript{28} knowledge test.

Attitude questionnaires were used in some of the studies (n = 5),\textsuperscript{20,25,28,29,35} as were team skills self-evaluations (n = 6).\textsuperscript{25–28,34,35} Two studies\textsuperscript{21,22} used informal narrative reflections to gain information on whether students felt their team knowledge, communication, and skills improved, and Robertson et al.\textsuperscript{35} used a student program assessment to determine whether students were satisfied with the way training was implemented.

The majority of studies (n = 16)\textsuperscript{20–24,26–36} found improvements in team knowledge, communication, and skills.

Methodological quality

All but 2 studies\textsuperscript{20,36} reported the population from which their subjects were recruited. However, the total number of students from which the study sample was drawn was reported in only 7 studies.\textsuperscript{21,23,26–28,32} Of those 7 studies, 5\textsuperscript{21,23,26–28,32} reported participation rates of more than 75% of the population; the remaining 2 studies\textsuperscript{27,30} reported participation rates of more than 70%. Only 2 studies\textsuperscript{27,30} reported having...
Table 1
Summary of the Curriculum Basis, Team-Based Competencies Evaluated, Outcomes, and Methodological Quality in 17 Studies Evaluating Prelicensure Team Training Interventions and/or Teaching Methods, 2000 to August 2014

<table>
<thead>
<tr>
<th>Study authors, year</th>
<th>Curriculum basis</th>
<th>Team-based competencies evaluated</th>
<th>Participants</th>
<th>Outcomes</th>
<th>Methodological quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aebersold et al, 2013</td>
<td>CRM, SBAR communication tool</td>
<td>Fault tolerance; effective followership and leadership; specific, direct, and concise feedback (this is what they explicitly evaluated); situational awareness; sterile cockpit concept (and recognizing critical tasks)</td>
<td>28 nursing students</td>
<td>CRM-based teaching resulted in about 56% of the groups using the taught standardized tool (n = 5/9).</td>
<td>Small sample size; no statistical analysis and limited data; no control group or pre/post testing.</td>
</tr>
</tbody>
</table>
| Cahan et al, 2010 | Human factors training | Effective team communication and collaboration | 148 third-year medical residents | • Pilot 1: Trained participants had significantly higher scores on evaluation of how they would communicate with team members.  
• Pilot 2: Posttraining team communication scores were significantly higher.  
• Both pilots: Indicated that brief communication training can improve how students work with other team members. | Qualitative data (coded); good sample size; both intervention/control group and pre/post testing; communication scores were based on how clerks said they would act in a situation with other team members rather than assessing how they actually acted. |
| Di Prospero and Bhimji-Hewitt, 2011 | Team-based learning (non–health care related) | Trusting and respecting team members, accountability, group problem solving, interpersonal skills, open communication | 250 students from medical laboratory science, ultrasound, medical radiation science, chiropody, and cardiovascular perfusions programs | Reflections indicated that students could recognize what makes effective teamwork and what caused ineffective teamwork after experiential exercises. | Retrospective inquiry; qualitative reflection by the facilitators; could have significant bias since this was a pilot program that the authors were all involved with implementing; no comparison with students who did not have training or with pretraining students. |
| Fernandez Castelao et al, 2011 | CRM | Team coordination, communication, leadership skills | 176 medical students | • Cardiac no-flow time was significantly decreased compared with control (P = .014), which indicates improved technical performance.  
• Observed team leader verbalizations were significantly higher (P > .01) compared with control, but only one criterion of team member verbalizations (unsolicited information) was significantly higher (P = .012). | Randomized controlled study; accounted for variables; amended previously validated performance measures and checklists. |
| Fernandez et al, 2013 | Social learning theory, cTPT | Mission analysis, goal specification, strategy formulation, systems monitoring and adaptation, team monitoring/back-up behaviors, coordination, leadership, communication | 231 medical students and emergency medicine residents | The cTPT-trained group had a significant increase in teamwork behaviors and patient care performance compared with the control group. | Pilot study; lacked a standardized curriculum; good evaluative tools; very large sample size. |
| Fulmer et al, 2005 | Experiential learning | Interprofessional attitudes | 537 postgraduate students (medicine, nursing, social work) | No statistically significant changes in ability to plan interprofessional geriatric care plan and no significant change in knowledge of team dynamics. | No statistically significant changes in ability to plan interprofessional geriatric care plan and no significant change in knowledge of team dynamics. |

(Table continues)
Table 1 (Continued)

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<tbody>
<tr>
<td>Garbee et al, 2013</td>
<td>CRM, high-fidelity simulation</td>
<td>Team-based behavior, shared mental model, coordination, cooperation, communication, situational awareness, adaptive communication and response</td>
<td>52 nursing, nurse anesthesia, medical, and respiratory therapy students (decreased to 40 participants in second round of testing)</td>
<td>Significant improvements in team skills between scenarios (P &lt; .05); significant decrease in skills between fall and spring scenarios; significant increase from first scenario in fall to last scenario in summer; indicated that CRM team training with simulation is effective and that repeat training is beneficial.</td>
<td>Quasi-experimental study; drop in subjects’ retention between fall and winter; does not account for whether debrief or simulations caused increase in performance.</td>
</tr>
<tr>
<td>Garbee et al, 2013</td>
<td>High-fidelity simulation</td>
<td>Team-based behavior, shared mental model, coordination, cooperation, communication, situational awareness, adaptive communication and response</td>
<td>35 medical, nursing, nurse anesthesia, and physical therapy students (decreased to 15 participants in second round of testing)</td>
<td>Significant improvements in team skills between scenarios (P &lt; .05); significant decrease in skills between fall and spring scenarios; significant increase from first scenario in fall and last scenario in summer; indicated that high-fidelity simulation is an effective method of teamwork training.</td>
<td>Quasi-experimental study; drop in subjects’ retention between fall and winter; does not account for whether debrief or simulations caused increase in performance; small sample size.</td>
</tr>
<tr>
<td>Hobgood et al, 2010</td>
<td>TeamSTEPPS</td>
<td>Situational awareness, shared mental model, leadership</td>
<td>235 medical students and 203 nursing students</td>
<td>All cohorts improved significantly but showed no significant difference in improvement between cohorts, which suggests that any method of team training is useful in teaching the TeamSTEPPS curriculum.</td>
<td>Randomized controlled trial; large sample size for educational intervention; wide array of evaluation methods including the use of a validated scale (Mayo High Performance Teamwork Scale); only assesses short-term learning.</td>
</tr>
<tr>
<td>Ankouskas et al, 2011</td>
<td>CRM</td>
<td>Team effectiveness, teamwork, task management, situational awareness, interprofessional attitudes</td>
<td>50 nursing students and 46 medical students</td>
<td>Significant difference in the change between pre- and posttest scores between the control and experimental groups, with the experimental group showing significantly higher improvements. CRM training thus provided an effective method of teaching team process skills.</td>
<td>Experimental study; large sample size; used validated behavioral checklist, although it was designed for use in hospital settings.</td>
</tr>
<tr>
<td>Kesten, 2011</td>
<td>SBAR communication tool</td>
<td>Clear and effective communication</td>
<td>115 nursing students</td>
<td>Both groups demonstrated a significant increase in communication knowledge. Students who received SBAR role-play instructions communicated significantly better in the simulation than the group that received didactic training alone (P = .005).</td>
<td>Randomized control trial; only tested for retention of SBAR skills and not strictly communication skills—this may have created a bias.</td>
</tr>
<tr>
<td>Krautscheid, 2008</td>
<td>SBAR communication tool</td>
<td>Clear and effective communication</td>
<td>285 nursing students</td>
<td>Improvement was seen in cohorts that had received communication training compared with the control group.</td>
<td>Pilot study.</td>
</tr>
<tr>
<td>Marshall et al, 2009</td>
<td>SBAR communication tool</td>
<td>Clear and effective communication</td>
<td>177 medical students</td>
<td>SBAR training had a positive effect on the communication performance of medical students.</td>
<td>Randomized controlled trial; large sample size; observed behavior score sheet was not validated and was created specifically with SBAR in mind, meaning that it could have created a bias in the results as it then does not necessarily reflect actual effective communication but, rather, the ability to perform SBAR correctly.</td>
</tr>
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(Table continues)
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less than 50 participants, and only 326,29,34 reported having less than 100 participants. The remaining studies all reported more than 100 participants. All but 3 studies20,22,31 reported the statistical tests used (Di Prospero and Bhimji-Hewitt22 used qualitative methods of assessment). Interrater reliability was reported to have been controlled for in 11 studies,21,23,26–30,32–34,36 which includes reported rater training (n = 6),23,26,27,29,34,36 blinding of the evaluators or patients (n = 4),28,30,32,36 and establishment of rater agreement rates (n = 5).21,29,30,32,33 Ten studies20–22,25,28,30–33,35 described assessment methods that had not previously been shown to produce valid results. Instead, all of these studies20,22,25,28,30–33,35 reported creating their own methods specifically for the study, with one also using qualitative reflection.22 Three studies24,25,35 that created their own assessment methods discussed their development with teams of experts, using an evidence base. Krautscheid31 reported modifying the assessment between cohorts. All but 6 studies21,25,26,31,34,36 provided detailed information on the content of their team training curriculum.

See column six of Table 1 for the categories used to determine the methodological quality of each study.

Discussion

Quality and validity of assessment measures

There was little consistency between studies in the content and quality of assessment measures. The variety of assessment measures, many of which were not shown to be evidence based or to produce valid data in previous studies, is partially due to the fact that there are no obvious choices for team training assessment measures at the prelicensure level.5 Most of the studies26–29,34 that did use preexisting assessment measures had to adjust for the fact that those assessments were for postlicensure training and geared toward specific situations and skills. The only assessment measure of team training developed specifically for the prelicensure level is the KidSIM Team Performance Scale.36 There was also a lot of discrepancy when it came to what competencies the measures were assessing. Additionally, the inconsistent use of labels and abbreviations made it difficult to compare the results of different studies. For example, some studies used the term “team leadership” to refer to different skills, while others used the term “communication” to refer to different aspects of communication. This makes it difficult to draw conclusions about the effectiveness of different training programs.

Marshall et al, 201239

SBAR communication tool

Clear and effective communication

168 medical students

Significant retention of SBAR performance skills 6 months after small SBAR training session compared with the control group.

Paige et al, 201434

High-fidelity simulation

Shared mental model, role clarity, situational awareness, cross-monitoring, open communication, resource management, flattened hierarchy, anticipatory response, mental rehearsal

28 medical students, 18 nursing students, and 20 nurse anesthesia students

Significant increases from pre- to postsession team performance scores in all areas, which indicated that a single session of high-fidelity simulation can be an effective model of team teaching.

Krautscheid31

Modifying the assessment between cohorts.

Robertson et al, 201036

TeamSTEPPS

Team leadership, mutual performance monitoring, backup behaviors, adaptability team/collective orientation, shared mental models, mutual trust, closed-loop communication

104 medical students and 88 nursing students

TeamSTEPPS training. After training, students were able to recognize effective team skills in a good team skills example video but were less able to recognize ineffective team skills in a poor team skills example video. The order of training had no impact on knowledge scores.

Sigalet et al, 201336

High-fidelity simulation

Leadership, roles and responsibilities, communication, situational awareness

196 medical, nursing, and respiratory therapy students

Teams who had received didactic training had significantly higher team performance scores, but there was an increase in scores for all teams (including those in the control group) during the second scenario, indicating that a didactic and simulation approach may be an effective method of team training.

Robinson et al, 201434

High-fidelity simulation

Shared mental model, role clarity, situational awareness, cross-monitoring, open communication, resource management, flattened hierarchy, anticipatory response, mental rehearsal

28 medical students, 18 nursing students, and 20 nurse anesthesia students

Significant increases from pre- to postsession team performance scores in all areas, which indicated that a single session of high-fidelity simulation can be an effective model of team teaching.

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Abbreviations: CRM indicates crisis resource management; SBAR, Situation, Background, Assessment, Recommendation; cTPT, computer-based teamwork process training; TeamSTEPPS, Team Strategies and Tools to Enhance Performance and Patient Safety.

A crisis resource management–based training program developed for health care workers.

Table 1 (Continued)
definitions surrounding teamwork, which is common within the wider teamwork literature, is also evident throughout the studies surveyed. This variety of terms and meanings makes it difficult to draw conclusions from the comparison of these studies.

Types of team training used
Many of the studies used CRM principles or variations of them derived from aviation as the basis for their curriculum content. Variations include TeamSTEPPS and the SBAR communication tool. Given that CRM principles are being used effectively at the postlicensure level, it is not surprising to find them readily used at the prelicensure level. Even though CRM was developed originally for aviation, there are indications that its principles are appropriate to use in other team environments as well as a lot of evidence indicating its effectiveness in improving team performance, both in health care settings and other professions. It is argued, though, that because of the large amount of resources required to implement many CRM-related programs, this type of training can be difficult to both start and sustain. Like CRM, high-fidelity simulation, which was commonly used as a teaching method and even as the main way of teaching in some of the studies reviewed, has evidence indicating its effectiveness but is also resource intensive. Fernandez et al argued that their computerized, didactic team training was a more easily disseminated option, but they did not specify the content taught. Only one study used non-health-care-related team training content as the basis of their training, an approach which may warrant further exploration.

Team composition
Most of the teams in the studies were composed primarily of medical and nursing students, with only a small proportion of other health care professions represented, and many studies only focused on uniprofessional training. The composition of teams in the studies reviewed was not representative of the actual composition of interprofessional teams in the workforce or of the health care professional student population at large. In reality, medical and nursing students only constitute a small portion of health care professions students; for example, at one large Canadian university, medical and nursing students only represent 31.7% of the students in health sciences programs. Although the team skills developed through the training interventions and/or teaching methods used in the studies reviewed may be generalizable to interprofessional teamwork, it is difficult to know for certain whether improved team skills developed uniprofessionally or with minimal professional diversity can be used as effectively in interprofessional teams.

Efficacy of team training interventions and/or teaching methods
The vast majority of studies did find that team training could have positive effects on team knowledge, communication, and skills at the prelicensure level, but there were a variety of assessment measures, varying levels of evidence, and inconsistent terminology with regard to the competencies evaluated. Therefore, we could not determine whether any of the team training interventions and/or teaching methods is more or less effective at improving team skills or knowledge at the prelicensure level. The one exception was that the geriatric interdisciplinary team training content and methodologies did not appear effective at improving team knowledge, communication, and skills. The apparent equality of teaching methods is consistent with Hobgood et al finding that various teaching methodologies were equally effective in teaching the CRM curriculum, and with arguments that the method of teaching is less important than the actual design of the team training.

Limitations
This review has several limitations. The search was limited to studies published in English. Studies that did not identify as team training or use terms such as interprofessional relations or team training would not have been identified. The evaluation of the quality of the studies and curriculum content could be the result of ineffective reporting in the studies. The sample size of papers was limited; furthermore, 8 of the 17 studies reviewed only focused on uniprofessional team training programs. The review was performed as a descriptive analysis and, as such, lacks the rigors of a systematic review.

Conclusion
This review highlights the state of team training at the prelicensure level as well as the gaps in assessment measures and the knowledge of their efficacy. From this review, it appears that team training is an effective way to improve team knowledge, communication, and skills in prelicensure learners. Yet, while providing interprofessional education at the prelicensure level has increasingly become a priority in the past 15 years, this review also seems to indicate a real gap in team-training-focused prelicensure interprofessional education. Although there do seem to be positive correlations between team training at the prelicensure level and team knowledge, communication, and skills, there is little evidence to indicate the best way to implement team training and the long-term effects training has on practice. There are also very few evidence-based ways to objectively assess prelicensure team training, and even fewer that do not focus on acute care situations.

Given that the majority of studies did find that team training initiatives, regardless of teaching methodology, had a positive effect on team knowledge, communication, and skills at the prelicensure level, it may be helpful for team training curricula to be incorporated into preexisting prelicensure interprofessional education programs. A continued commitment to incorporating a variety of health care professions is also essential. Continued exploration of the best method of team training is necessary, and as such we conclude there is a strong case for the development of a two-part study of prelicensure team training. The first part should consist of the evidence-based development of an objective assessment measure for team training at the prelicensure level. The second part should be a large-scale, interprofessional study that uses the developed assessment measure to evaluate and compare various team training curriculum bases (such as CRM, TeamSTEPPS, the SBAR communication tool, and high-fidelity simulation) and methodologies (such as simulated situations, didactic learning, and small-group learning) to determine the most effective way to move forward in prelicensure interprofessional team education.

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5. Nelson is vice provost, academic, and professor, Faculty of Nursing, University of Toronto, Toronto, Ontario, Canada.
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