

Review

Examining the nature of interprofessional interventions designed to promote patient safety: a narrative review

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Abstract

Purpose: This narrative review aimed to scope the patient safety literature to identify interprofessional intervention approaches, sources of evidence and reported outcomes.

Data sources: Two major databases (MEDLINE and CINAHL) were searched from 2005 to 2015.

Study selection: A total of 1552 abstracts were initially identified. After screening these abstracts, 129 full papers were obtained. Further screening resulted in a total of 89 papers included in this review.

Data extraction: The following information was extracted from each included paper: details on the patient safety intervention, study methods employed and outcomes reported.

Results of data synthesis: It was found that the bulk of the included studies was undertaken in a North American acute care context. Most often, studies involved qualified professionals from nursing and medicine collaborating in hospitals and medical centres. Nearly half the studies reported in this review employed educational interventions, such as TeamSTEPPS, aimed at enhancing practitioners' competence of delivering safe patient care. Nearly a third of studies involved practice-based interventions (e.g. checklists) aimed at improving the delivery of safe care. Most of the studies used a quasi-experimental design and typically gathered survey data. The majority reported outcomes related to changes in professionals' attitudes, knowledge and skills. There were, however, fewer studies reporting changes in practitioners' safety behaviours, organizational practices or patient benefit.

Conclusion: The use of different interprofessional interventions are key activities involved in promoting safe patient care practices. However, further work is needed to strengthen these interventions and their evaluations.

Key words: patient safety, interprofessional education, interprofessional practice, intervention, narrative review

Introduction

The management of risk and patient safety are major drivers in the National Health Service (NHS) and other health systems in developed countries. The implementation of these activities is regarded as critical to prevent and ameliorate harm related to the delivery of healthcare [1, 2]. The need to reduce avoidable harm and improve the delivery of safe patient care has been repeatedly highlighted in a number of reports around the world over the past 20 years [3–5]. Employing safe patient care practices requires input by all sections of the system: from managers to practitioners and unifies, like nothing else, health and social care professions.

A common underlying reason for failures in patient safety has been ineffective teamwork and communication, which has spawned an increased emphasis on improvement [6, 7]. Effective interprofessional collaboration and teamwork is understood to rely on continuous and open communication, an understanding of different professional roles and responsibilities as well as respect for colleagues from different professional groups [8, 9].

Various safety initiatives and interventions aimed at improving collaboration and the delivery of patient care have been implemented over the past decade. Examples include the introduction of tools for the safe handover of key clinical information [10], checklists designed to ensure effective communication and agreement within teams [11] and interprofessional team training sessions, such as simulation aimed at developing collaborative competencies which support effective teamwork [12]. However, patient safety remains a difficult problem to solve simply because the notion of safety is not simply a technical issue, but involves input from different people based on practices that are embedded in organizational and professional cultures [13]. In order to achieve a safer environment for care delivery, team members need to feel confident to question, review and reflect on their interdependent work which involves a range of professional groups, and confront difficult issues like power imbalances, limited trust in relationships and interprofessional hierarchies [8].

This paper reports the results from a narrative review which mapped the available literature in relation to the use of interprofessional patient safety interventions.

Methods

The specific aim of this review was to scope the interprofessional patient safety intervention literature to identify what is known about intervention approaches, sources of evidence, reported outcomes and to identify current gaps in the literature. This form of narrative review (also called a scoping review) is being used increasingly by researchers to explore health research evidence [14, 15], enable the clarification of complex concepts and refine subsequent research inquiries [16]. Such reviews are useful because they are wide ranging and are therefore particularly relevant to examine areas in which evidence is emerging [17]. The findings of these types of narrative

reviews can be particularly useful to inform subsequent systematic reviews aimed at generating more in-depth accounts of the nature of evidence.

Inclusion criteria

The following inclusion criteria related to the nature of interventions, participants, study designs and reported outcomes were employed.

Interventions

An interprofessional patient safety intervention was defined as follows: when members of more than one healthcare profession work/learn interactively together, for the explicit purpose of improving patient safety.

Participants

Among the professional groups included were physicians, psychologists, psychotherapists, midwives, nurses, pharmacists, physiotherapists, occupational therapists, radiographers, speech therapists, social workers, care/case coordinators and managers.

Study designs

All research/evaluation designs (e.g. action research, case study, ethnographic, experimental and quasi-experimental studies) were included.

Reported outcomes

All outcomes reported in the included studies included and classified using a modified Kirkpatrick outcomes typology [18], which has six types of outcomes (see Table 1).

Searching and screening processes

In order to identify all the relevant literature, an initial database search was undertaken using the broad key terms, for example, ‘interprofessional and patient safety’ or ‘multiprofessional and patient safety’, ‘teamwork and patient safety’. Two main electronic databases (MEDLINE and CINAHL) were searched for a decade (January 2005 to December 2015) during which there was a significant growth in patient safety studies. This resulted in 2016 potential abstracts (see Fig. 1).

Once duplicates were removed, a total of 1552 abstracts were assessed by one reviewer (E.C.) to determine if they met the inclusion criteria outlined above. To ensure consistency of decision-making, a second reviewer (S.R.) reviewed all papers selected for inclusion as well as a 10% sample of excluded abstracts and papers.

Following this process, a total of 129 abstracts were identified as meeting the inclusion criteria. The full papers were obtained and screened independently by two of the reviewers (E.C. and S.R.). At

Table 1 Classification of reported outcomes

Outcomes	Description
1. Reactions	These cover participant views on the nature of an intervention
2a. Attitudes/perceptions	Outcome that relate to changes in reciprocal attitudes or perceptions between participant groups
2b. Knowledge/skills	These relate to the acquisition of concepts, procedures and principles and/or problem-solving/clinical skills
3. Behavioural change	These cover the transfer of learning to changes in individuals’ behaviour
4a. Organizational practice	Outcomes that relate to wider changes in the organization and delivery of care
4b. Patient benefit	Any improvements in the health and well-being of patients as a direct result of an intervention

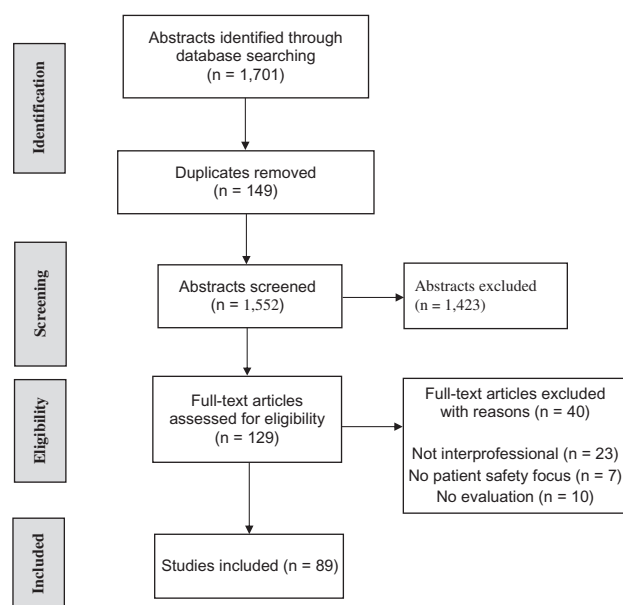


Figure 1 Searching and screening results.

this stage, 40 papers were excluded as they did not meet the inclusion criteria. This process produced a total of 89 papers included in this review.

Analysis

Abstraction of key information was undertaken by three of the reviewers (E.C., S.L. and S.R.). Details related to the patient safety intervention (e.g. location, professional mix and number of participants), study methods (e.g. design, data collection and data analysis) and study outcomes were collated. Based on prior analysis of interprofessional interventions [19], included studies were categorized into one of three different types:

- *Interprofessional education* defined as interventions that included a curriculum with explicitly stated learning objectives/outcomes and learning activities (e.g. seminars and simulation) aimed at improving collaboration;
- *Interprofessional practice* defined as interventions that aimed to improve how professionals interacted in practice through the use of activities such as meetings or checklists;
- *Interprofessional organization* defined as interventions that aimed to promote collaboration by the use of institutional policies, clinical guidelines or the redesign of workspaces.

Table 2 Types of interprofessional interventions used to promote patient safety

Intervention approach	Included studies	
	N	%
Interprofessional education	43	48
Interprofessional practice	24	26
Interprofessional education and practice	14	16
Interprofessional education and organization	4	5
Interprofessional practice and organization	4	5
Total	89	100

A spreadsheet was created to chart relevant data and enable the identification of commonalities, themes and gaps in the literature [14].

Results

The results are presented in two main sections. First, key details related to the nature of patient safety interventions contained in the 89 studies are described. Second, methodological and outcomes information connected to these studies are outlined (see Appendix 1 for an overview of key details from the 89 included studies and a full reference list of these studies—available online as supplementary material).

Patient safety interventions

We found that 68 of the included studies (76%) were undertaken in a North American context, whereas only 14 studies (16%) were from Europe, with the remaining studies undertaken in Iraq ($n = 2$), Israel ($n = 2$), Malaysia, Australia and Japan. Most of the included studies were published in the past few years—50 studies (56%) published between 2012 and 2015, 34 studies (32%) published between 2008 and 2011 and 5 studies published between 2005 and 2007.

The overwhelming majority of studies reported on the implementation of interprofessional patient safety interventions in acute clinical organizations (73 studies, 82%) with most located in surgery, obstetrics, intensive care or emergency medicine settings. In contrast, only 10 studies (11%) based their interventions in university settings. In addition, four studies were undertaken in community organizations and two studies in mixed (acute/community) locations.

In relation to which professional groups were involved in these interprofessional patient safety interventions, we found that it was predominately medicine (82 studies) and nursing (80 studies) (due to multiple reporting of different professional groups within each of the included studies, actual figures exceed 89). In contrast, other professional groups, such as pharmacy (20 studies), respiratory therapy (12 studies) and physiotherapy (9 studies) were less frequently involved. In regard to the level of the participants, most studies involved qualified practitioners (77 studies, 86%), with only 10 studies (11%) involving undergraduate students, and 2 studies which involved a mixture of practitioners and students.

Table 2 indicates the different types of intervention approaches used in the included studies. As outlined in this table, most studies employed a single interprofessional patient safety intervention activity: interprofessional education ($n = 43$, 48%) or interprofessional practice ($n = 24$, 26%). In contrast, 22 of the included studies employed a mixture of different interprofessional intervention approaches.

These broad interprofessional intervention approaches employed a range of different educational, practice and organizational methods and activities. For example, studies that used interprofessional education activities involved interactive seminars, workshops or team-based simulation [20–23]. Often, these educational interventions employed TeamSTEPPS or crisis resource management approaches [24–27]. Studies reporting the use of interprofessional practice interventions tended to employ team checklists [28, 29], team briefings [30, 31] or patient safety rounds [32, 33]. Those studies that employed multiple intervention methods blended, for example, team-based training with practice-based activities such as the use of a team briefing [34, 35].

The duration of these interventions ranged widely from a few hours of participation in a team training workshop [24] to practice-based interventions which lasted over a number of months [36].

Methods and outcomes

In relation to study designs employed in the included studies, overwhelmingly the most common used was the before-and-after design (48 studies, 54%), followed by the post-intervention design (16 studies, 18%) (see Table 3). In contrast, other study designs such as randomized controlled trials, controlled before-and-after and mixed methods designs were employed much less often.

As Table 4 indicates, most studies ($n = 58$) gathered a single form of data, whereas 28 studies collected two forms of data, 2 studies gathered three forms of data and 1 study collected four forms of data. Surveys were the most popular form of data used in the included studies, with the Safety Attitude Questionnaire [37], Teamwork and Safety Climate Survey [38] and the TeamSTEPPS Teamwork Attitudes Questionnaire [24] being used most frequently.

Table 5 displays the range of different outcomes reported in the included studies. As this table indicates, in total, across the 89 studies 143 outcomes were reported with the bulk ($n = 95$) relating to cognitive outcomes (Levels 1, 2a, 2b—reactions, perceptions/attitudes and knowledge/skills). This contrasts to a significantly lower number of studies ($n = 48$) reporting outcomes linked to changes to behaviour, organizational practice and patient care (Levels 3, 4a and 4b). In relation to the number of outcomes reported by each study, 42 studies reported one outcome, 40 studies reported two outcomes and 7 studies reported three outcomes linked to their evaluations of interprofessional patient safety interventions.

In terms of the nature of the outcomes from studies reporting at Level 1 (see Table 1), these were usually linked to participant satisfaction of an interprofessional patient safety course [39, 40]. For studies reporting Level 2a outcomes, these were typically linked to improved perceptions about safety culture [41] or enhanced attitudes towards teamwork [24]. For studies reporting Level 2b outcomes, these generally focused on self-report changes in knowledge and/or skills related to collaborative and patient safety [42, 43]. Studies reporting Level 3 outcomes usually employed observation tools or checklists to record behaviour change following a patient safety intervention [36, 44]. Studies that reported Level 4a changes normally focused on increases to safety reporting practices and interprofessional team debriefings [30, 45]. Of the studies reporting Level 4b outcomes, these typically focused on changes in the health outcomes and delivery of care, including improvements to rates of morbidity, reduction of adverse event rates and timely delivery of patient medications [29, 46].

Table 3 Study designs employed in the included studies

Study design	N	%
Before-and-after	48	54
Post-intervention	16	18
Longitudinal	8	9
Controlled before-and-after	5	6
Qualitative case study	4	5
Mixed methods	3	3
Randomized control trial	2	2
Not stated	2	2
Cohort study	1	1
Total	89	100

Discussion

This review was undertaken to scope the interprofessional patient safety literature in order to map the use of interventions, sources of evidence and reported outcomes. In doing so, the review aimed to understand the nature of this literature and identify gaps which need addressing in future research. As reported above, we found nearly a hundred studies that met our inclusion criteria. Of these studies, the bulk was undertaken in a North American acute care context. Most often, these studies involved qualified nurses and physicians collaborating in clinics based in hospitals and medical centres. Nearly half the studies employed educational interventions aimed at enhancing individual practitioners' patient safety competence and nearly a third of studies involved practice-based interventions aimed at improving the delivery of safe patient care. Most of the included studies used a quasi-experimental (pre/post- or post-intervention) design and typically gathered survey data to evaluate the effects of their interprofessional interventions. In relation to reported outcomes, the bulk of studies focused on reporting changes to individuals' cognition, skills and behaviours (Levels 1, 2a, 2b and 3), with far less reporting of changes to organizational practice or to patient benefit (Levels 3, 4a and 4b).

As previously noted, interprofessional patient safety interventions were typically implemented in acute clinical settings (e.g. surgery, obstetrics departments or intensive care units). Upon closer inspection of these interventions (see Appendix 1), one can detect some possible trends across clinical settings. For example, studies undertaken in a surgical context tended to employ interprofessional practice interventions most often, whereas studies undertaken in obstetrics or emergency medical settings employed more interprofessional education interventions. Studies reporting hospital-wide patient safety interventions (i.e. those involving multiple departments within a single institution) and studies based in intensive care units employed equal numbers of interprofessional education or practice interventions (delivered as a single activity). In relation to the use of mixed interventions, studies based in surgical departments most regularly combined interprofessional education and practice interventions, followed by studies in general medicine departments and intensive care units. In contrast, other acute care settings used mixed interventions less often. Of the remaining (community care or mixed setting) studies, these employed interprofessional education alone or interprofessional education/practice interventions combined with either an interprofessional practice or organizational intervention. While it is difficult to provide a rationale for the differing use of interprofessional interventions across clinical contexts, one key element appears to be central to why choices were made about what type(s) of interprofessional intervention were implemented. For the included studies, the design of their interventions appeared to be highly influenced by local contextual factors. Repeatedly, study authors noted that a range of department or institutional pressures and problems compromised patient safety which required the input from a collaborative effort of staff. As a result, 'bespoke' interprofessional (education, practice and/or organizational) activities were developed and delivered. This focus on contextual factors reinforces arguments about the importance of paying close attention to local cultures to ensure that improvement activities can be designed to be more effective in addressing their intended problems [8, 47].

In relation to interprofessional interventions which focused on patient benefit, as presented in Table 5, 30 studies reported that the use of an intervention led to changes in safe patient care (Levels 4a and 4b). These studies reported changes to organizational practice (e.g. improved patient safety reporting) and health outcomes (e.g. timely delivery of patient medications). It was found that practice-based

Table 4 Data collection methods

Data collected	N	%
Surveys	47	53
Surveys/audit	16	18
Surveys/observations	6	7
Audit	4	5
Observations	4	5
Interviews	3	3
Surveys/interviews	3	3
Audit/observations	2	2
Surveys/interviews/observations	2	2
Surveys/interviews/audit/observations	1	1
Observations/interviews	1	1
Total	89	100

Table 5 Reported outcomes

Reported outcomes	N
Level 1—Reaction	16
Level 2a—Perceptions and attitudes	48
Level 2b—Knowledge and skills	31
Level 3—Behavioural change	18
Level 4a—Organizational practice	19
Level 4b—Patient benefit	11
Total ^a	143

^aThis number exceeds 89 as the included studies reported more than one outcome.

interventions, such as the use of interprofessional team meetings or checklists generated improvements to patients’ safety [29, 45]. In general, these interventions were implemented as a single activity, however, they were also occasionally combined with an interprofessional organization intervention [48] or an interprofessional education intervention [49]. In contrast, interprofessional education interventions implemented alone tended to only report changes in participants’ abilities (attitudes, knowledge, skills and behaviours) in regard to thinking about or engaging in collaboration for patient safety [39, 50]. This distinction between the use of different intervention approaches and their possible outcomes is helpful to consider when designing a future interprofessional intervention in relation to its desired aim(s)—improving participant abilities and/or improving the safe delivery of care to patients.

Collectively, the included 89 studies provide an encouraging indication that the use of interprofessional education, practice and/or organizational interventions can promote improvements to patient safety. This finding provides support for repeated policy calls focused on the need to strengthen interprofessional collaboration to minimize unsafe patient practice [3, 5]. Moreover, as the review found, the use of interprofessional interventions to promote patient safety is expanding—with over 50% of included studies published between 2012 and 2015. While interprofessional interventions are increasingly being used for improving collaboration between professions to reduce patient harm, there are a number of issues related to the definition and application of interventions as well as methodological limitations which need to be acknowledged.

The review found a widespread use of single interventions, usually in the form of a short team training session or introduction of a one-page checklist. While such activities may provide initial support

and direction in identifying patient safety issues, their influence is limited due to the complex nature of delivering safe interprofessional care. Given these complexities, it has been argued that a more effective approach is to employ multifaceted interventions [8]. Such approaches aim to address shortfalls by providing a package of different complementary educational, practice-based and organizational interventions.

In addition, as noted above, the included studies tended to use self-report data in the form of a range of surveys reporting individuals’ perspectives on possible changes associated with the use of an intervention. Given that individuals’ ‘perceptions’ of change can differ from ‘actual’ change, data gathered from these surveys need to be questioned. The use of these surveys also overlooks the possible influence of complex contextual factors (e.g. professional dominance, hierarchical working arrangements and power imbalances), which have been reported to affect the implementation of interprofessional activities [13, 51].

Furthermore, given that most studies employed pre/post- or post-intervention designs, there was a limited attention on reporting the longer term outcomes related to the use of a patient safety intervention. As a result, it is difficult to tell whether the reported effects from an intervention were sustained over time. In addition, there is a need for interprofessional patient safety studies to gather short-term individual outcomes (changes to perceptions, knowledge and skills) as well as wider long-term outcomes (changes to organizational practice and patient benefit) to provide more comprehensive insights into the effects of their interventions.

Based on the results presented in this paper, a number of recommendations for the future use of interprofessional patient safety interventions can be offered. First, the use of multiple interprofessional (education, practice and organizational) interventions can be effective in addressing multifaceted issues relating to patient safety. Second, while the use of interprofessional education as a single intervention can affect changes in participants’ abilities to engage more in interprofessional collaboration, the use of interprofessional practice interventions (implemented on their own or with another interprofessional activity) can help improve the delivery of safe care to patients. Third, it is important to pay close attention to contextual factors in the design of education, practice and/or organizational interventions to ensure that they can be effectively tailored to address local patient safety problems. Fourth, there is a need to improve the quality of interprofessional patient safety evaluations by combining self-report data with other more robust forms of data (e.g. observations, health outcomes) gathered over longer time periods to examine how interventions have sustained any initial improvements to patient safety.

In relation to the limitations of the review, the search was constrained by only searching two databases, excluding the grey literature, not searching the reference lists of included papers and only including studies published in English. As a result, it is possible that the review may have missed a small number of potential studies.

Conclusion

This review searched the patient safety literature to map the use of interventions, sources of evidence and reported outcomes in order to identify gaps in the literature. We found that the use of interprofessional interventions are key activities involved in promoting safe patient care practices. However, further work is needed to strengthen these interventions and their evaluation. Interprofessional interventions should aim to combine education, practice and organizational

activities that overcome the limitations inherent in the use of single interventions in making positive change to the delivery of care. In addition, future studies should aim to employ more rigorous approaches in their evaluation of interventions, using mixed methods and longitudinal designs with outcomes focused on reporting wider organizational changes resulting from an interprofessional patient safety activity.

Supplementary material

Supplementary material is available at *International Journal for Quality in Health Care* online.

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