The effectiveness of assertiveness communication training programs for healthcare professionals and students: A systematic review

ABSTRACT

Background

Communication errors have a negative impact on patient safety. It is therefore essential that healthcare professionals have the skills and confidence to speak up assertively when patient safety is at risk. Although the facilitators to and barriers of assertive communication have been the subject of previous reviews, evidence regarding the effectiveness of interventions designed to enhance assertive communication is lacking. Thus, this paper reports the findings from a systematic review of the effectiveness of assertiveness communication training programs for healthcare professionals and students.

Objective

The objective of this review is to identify, appraise and synthesise the best available quantitative evidence in relation to the effectiveness of assertiveness communication educational interventions for healthcare professionals and students on levels of assertiveness, communication competence and impact on clinicians' behaviours and patient safety.

Data sources

The databases included: CINAHL, Cochrane library, EMBASE, Informit health collection, MEDLINE, ProQuest nursing and allied health, PsycINFO, Scopus and Web of Science. The search for unpublished studies included: MedNar, ProQuest Dissertations & Theses A&I. Studies published in English from 2001 until 2016 inclusive were considered.

Study eligibility criteria

The review included original quantitative research that evaluated (a) any type of independent assertiveness communication training program; and (b) programs with assertiveness training included as a core component of team skills or communication training for healthcare professionals and students, regardless of healthcare setting and level of qualification of participants.

Study appraisal and synthesis methods

Studies selected based on eligibility criteria were assessed for methodological quality and the data were extracted by two independent researchers using the Joanna Briggs Institute critical appraisal and data extraction tools.

Results

Eleven papers were critically appraised using the Joanna Briggs Institute critical appraisal checklists. Eight papers from the USA, Australia, Ireland, and Taiwan were included in the review.

Conclusions

Interventions to improve assertive communication were reported to be effective to some degree with all targeted groups except experienced anaesthesiologists. Face-to-face and multimethod programs, support from leaders, teamwork skills training and communication techniques adapted from the aviation industry were identified as appropriate approaches for optimising the effectiveness of assertiveness communication training programs. Behavioural change as the result of assertiveness interventions was evaluated by observer-based rating scales during simulation, whilst self-perceived knowledge and attitudes were evaluated using validated scales. Future research should consider evaluation of sustained effect on behaviour change and patient safety.

Keywords*:* assertiveness, speaking up, communication, training, healthcare professional, healthcare student

What is already known about the topic?

- Healthcare is increasingly focused on the development of non-technical skills such as assertive communication as a strategy to improve patient safety.
- Assertive communication or ‘speaking-up’ behaviours are viewed as essential components of teamwork and patient safety.

- There are cultural, professional, organisational and personal barriers that can impede healthcare professionals' assertive communication. Such barriers include fear of retribution, professional hierarchies, and lack of training.

What this paper adds

- Assertiveness communication training interventions were reported to be effective to some extent with all targeted groups except experienced anaesthesiologists.
- Face-to-face and multi-method interventions, support from leaders, teamwork skill training and communication techniques adapted from the aviation industry were positively evaluated.
- In addition to the evaluation of reaction and learning, behavioural change was evaluated by observer-based rating scales during simulation, but future studies should explore how assertiveness training could sustain the effect on behaviour change and improve patient safety.

1. Introduction

Communication errors have a negative impact on patient safety (Leonard et al., 2004). Several studies have demonstrated that inadequate information sharing due to healthcare professionals' hesitancy to 'speak up' leads to adverse patient outcomes (Greenberg et al., 2007, Rabøl et al., 2011, Sutcliffe et al., 2004). However, assertive communication has been shown to improve the performance of clinical teams (Kolbe et al., 2012). In recent years, assertiveness communication training programs have been implemented as a part of team training in healthcare but the effectiveness of these interventions is uncertain.

This review focused on studies of assertiveness communication training conducted to improve healthcare professionals' and students' failure to speak up when concerns are raised about patient safety. The aim was to identify, appraise and synthesise the best available quantitative evidence in relation to the effectiveness of assertiveness communication training programs for healthcare professionals and students on levels of assertiveness and communication competence, and the impact

of such programs on clinicians' communication behaviours and patient safety. For the purpose of this review, assertiveness refers to the ability to respectfully express concerns about issues that have the potential to impact patient safety and share opinions with other staff, including those in authority (Omura et al., 2016). 'Speaking up' is one form of assertive communication and refers to communicating specific observations, requesting clarification or challenging the decision of someone with positional power or authority to act (Kolbe et al., 2012, Sayre et al., 2012). Communication competence refers to "one's knowledge of appropriate communication practices as well as effectiveness at adapting to the surroundings in a communication situation" (Steele and Plenty, 2015. p. 297). Patient safety is defined as "freedom, for a patient, from unnecessary harm or potential harm associated with health care" (World Health Organization, 2009. p.79).

2. METHODS

2.1. Protocol and registration

This review was conducted according to the Joanna Briggs Institute's (JBI) systematic review protocol and reported according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement (Moher et al., 2009). The review protocol (Omura et al., 2016) is available from the JBI Database of Systematic Reviews and Implementation Reports. It is registered in PROSPERO, the International prospective register of systematic reviews (No. CRD42016053000).

2.2. Eligibility criteria

The review included quantitative research that evaluated (a) any type of independent assertiveness communication training program; and (b) programs with assertiveness training included as a core component of team skills or communication training for healthcare professionals and students, regardless of healthcare setting and level of qualification of participants.

Quantitative studies eligible for the review included randomised controlled trials (RCT), quasi-experimental, and before and after studies that examined levels of assertiveness and/or the levels of communication competence, and how this affected clinicians' communication behaviours and/or patient safety.

2.3. Search strategy

Keywords were located by a search of CINAHL and MEDLINE. Next, the search was conducted across all databases using identified keywords. Finally, the references of key identified papers were searched. Only studies published in English from 2001 till 2016 were considered.

The databases included: CINAHL, Cochrane library (including CENTRAL), EMBASE, Informit health collection, MEDLINE, ProQuest nursing and allied health, PsycINFO, Scopus and Web of Science. The search for unpublished studies included: MedNar, ProQuest Dissertations & Theses A&I.

Keywords were: 1) asserti*, speak* up, silence, 2) communicat*, train*, teach*, educat*, (staff or professional) development, 3) health (profession* or personnel*), physician*, doctor*, resident*, intern*, nurs*, midwi*, pharmacist*, allied health, student*

2.4. Study selection process

Studies selected based on eligibility criteria were assessed by two independent reviewers (MO, JM) for methodological quality before they were included in the review using the JBI Critical Appraisal Checklist for Randomised Controlled Trials (Table 1) and JBI Critical Appraisal Checklist for Quasi-Experimental Studies (non-randomised experimental studies) (Table 2). Disagreements were resolved through discussion or with a third reviewer (TLJ).

2.5. Data collection and synthesis process

Two reviewers (MO, JM) independently extracted data from included studies using the standardised data extraction tool from the JBI Meta-Analysis of Statistics Assessment and Review Instrument (MAStARI). Discrepancies were resolved through discussion. The extracted data included; population, type of intervention, type of comparator, study design and outcome relevant to the review aims. Due to variation in intervention methods and outcome measures, it was not possible to conduct a meta-analysis.

3. RESULTS

3.1. Study selection

After removing duplicates 5296 studies were screened and 79 assessed for eligibility using the PICOS criteria (Participants, Interventions, Comparisons, Outcomes, and Study design). Eleven papers were critically appraised using the JBI critical appraisal checklists for Randomised Controlled Trials and Quasi-Experimental Studies. Eight papers were included in the review. A flow chart adapted from the PRISMA diagram illustrating the selection process is presented in Figure 1.

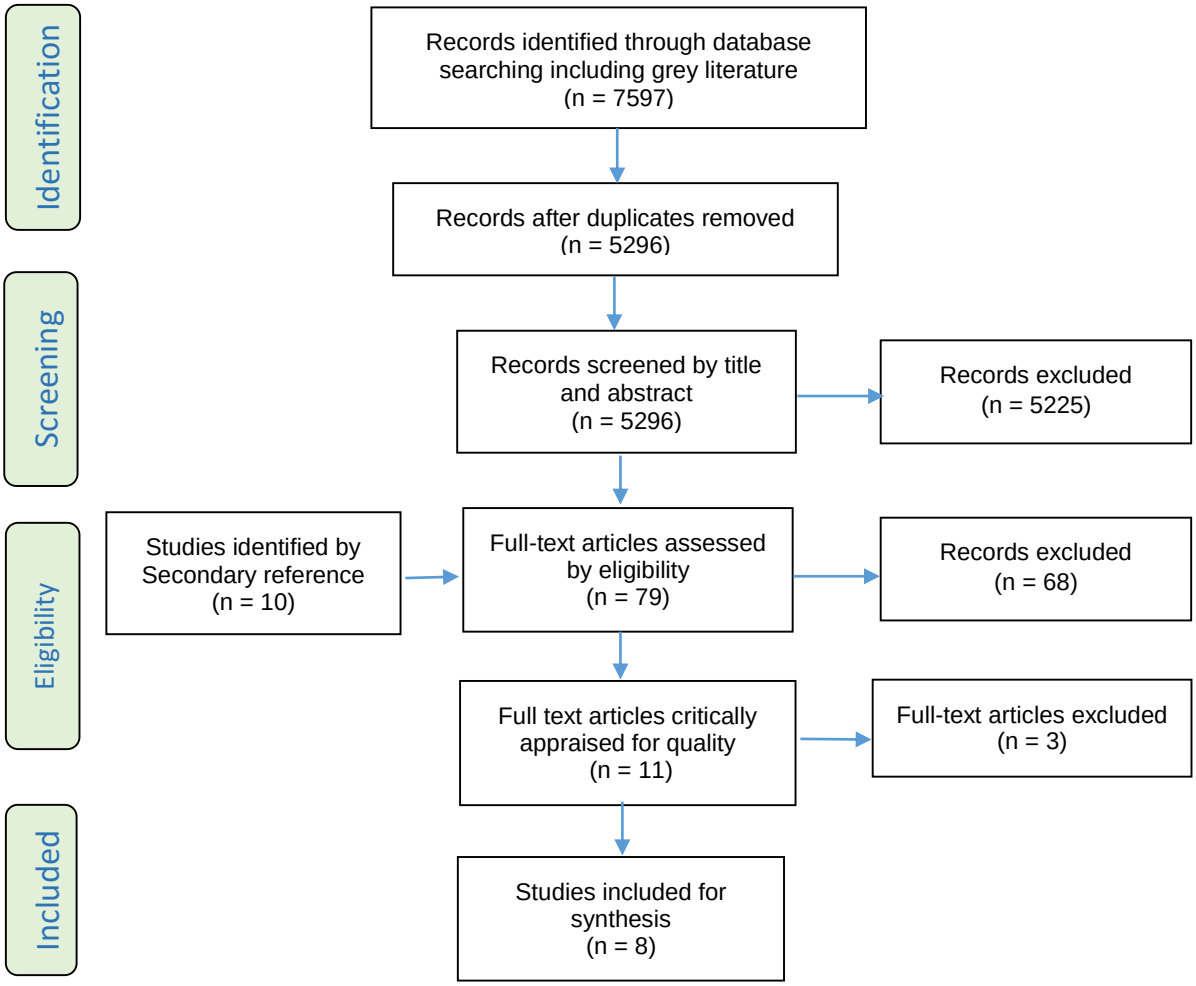

Figure 1 Systematic review flow diagram adapted from Moher et al. (2009)

3.2. Study characteristics

The majority of studies were conducted in the USA (n=5), whilst the remaining three were conducted in Australia (n=1), Ireland (n=1), and Taiwan (n=1). Assertiveness communication training programs were found to be effective to some extent with the all target groups including medical interns (O'Connor et al., 2013, Thomas et al., 2007), residents (Pian-Smith et al., 2009), registered nurses (Sayre et al., 2012) and students from the disciplines of nursing (Lin et al., 2004), midwifery (Warland et al., 2014) and medicine (Barzallo Salazar et al., 2014, Lin et al., 2004), with the exception of experienced anaesthesiologists (Raemer et al., 2016). Only one of the training programs targeted interdisciplinary participants (Lin et al., 2004). Details of the characteristics of selected studies including study design, participants, setting, interventions and outcome measures are presented in Table 1.

Table 1
Characteristics of included studies

Author Year	Study Design	Participants Setting	Interventions			Outcome measures
			Delivery mode	Duration	Content	Impact on clinician's communication behaviours (*IN COULOUR*) Level of assertiveness (*NO COLOUR*)
Thomas et al. (2007)	Post intervention RCT	USA, Interns in paediatrics, combined internal medicine/ paediatrics, family medicine, obstetrics /gynaecology	Face-to-face	2.5 hours	Team training plus human error curriculum, and instruction to practice the team behaviours at skill stations in addition to Neonatal Resuscitation Program	Frequency of team behaviours by observing video recordings of simulated resuscitations using low-fidelity mannequins
Raemer et al. (2016)	Post intervention RCT	USA, Practicing anaesthesiologists participating in a mandatory simulation-based crisis management course	Face-to-face	50 minutes	An interactive didactic presentation that included a patient safety rationale, a rubric for speaking up modified from aviation (the two-challenge rule), conversational skills (advocacy plus inquiry), and role-play exercise	Video analysis of three scenarios for speaking up to a surgeon, a circulating nurse and a colleague in a simulated operating room. Incidence of subject speaking up during each event was counted and compared
Bazallo Salazar et al. (2014)	Prospective RCT	USA, Medical students	Face-to-face	N/S*	Encourage vs Discourage by senior surgeons	In simulated operating room, students were considered to have spoken up if they questioned and did not proceed due to a mistake made by a senior surgeon
Pian-Smith et al. (2009)	Single group pre/post intervention	USA, Anaesthesiology trainee (residents) from hospital residency and fellowship programs affiliated Harvard Medical School	Face-to-face	30-45 minutes	The two-challenge rule with advocacy-inquiry technique (CRM training) taught during debriefing between the simulations	Pre and post intervention video-recorded obstetric operation simulation was coded by two blinded anaesthesiologists and compared

O'Connor et al. (2013)	Pre/post intervention study	Ireland, Interns who attended mandatory curriculum	Face-to-face	90 minutes	Small-group teaching consisted of human factors and errors in health care, nontechnical skills, communication techniques adapted from aviation, and filmed challenging situations	**Reaction:** post-training questionnaire **Learning:** pre and post questionnaires for knowledge and attitudes **Behaviour**: 2 patient scenarios from Program for Medical Education Innovations and Research observed by a psychologist
Sayer et al. (2012)	Pre/post intervention study	USA, Registered Nurses from 2, 300-bed acute care hospitals that belonged to the same health care system	Face-to-face	5-6 hours	A video of support from nurse and physician leader, followed by a discussion of organizational and individual obstacles, action plan, and peer support in small groups	Speaking-Up Measure by Premeaux & Bedeian (2003) List of individual nurse behaviours
Lin et al. (2004)	Pre/post intervention study with time1 and time2 post-test	Taiwan, Nursing and medical students with low level of assertiveness (Assertive Scale ≤ 50%)	Face-to-face	2 hours x 8 weeks	Multiple components with proper assertive behaviour, individual's fundamental rights, confronting criticism, refusal and requests, and expressing dissatisfaction	Assertive scale revised by Yang (1977). Score range from 35 to 210 with a higher score indicate a higher degree of assertiveness
Warland et al. (2014)	Single group pre/post intervention	Australia, Undergraduate midwifery students	Face-to-face	1 day	Workshop when they returned to university after a clinical placement 3-4 month later	Validated assertiveness questionnaire by Begley and Glaken (2004)

*N/S: Not specified

3.3. Risk of bias within studies

There are three RCTs reporting Level 1.c evidence for effectiveness of experimental designs according to JBI Levels of Evidence criteria (JBI, 2013). The results of the critical appraisal and risk of bias of each RCT are presented in Table 2.

Table 2
Results of critical appraisal for Randomised Controlled Trials

Questions (potential bias)	Barzallo Salazar et al	Raemer et al	Thomas et al
1. Was true randomisation used for assignment of participants to treatment groups? (selection bias)	Yes	Yes	Yes
2. Was allocation to treatment groups concealed? (selection bias)	No	Unclear	Unclear
3. Were treatment groups similar at the baseline? (selection/design bias)	Yes	Unclear	Unclear
4. Were participants blind to treatment assignment? (performance bias)	Yes	Yes	Unclear
5. Were those delivering treatment blind to treatment assignment? (performance/detection bias)	No	Unclear	No
6. Were outcomes assessors blind to treatment assignment? (ascertainment bias)	No	Yes	Yes
7. Were treatments groups treated identically other than the intervention of interest? (systematic difference/contamination bias)	Yes	Yes	Yes

8. Was follow-up complete, and if not, were strategies to address incomplete follow-up utilized? (attrition bias)	Yes	Yes	Yes
9. Were participants analysed in the groups to which they were randomized? (Intention to analysis)	Yes	No	No
10. Were outcomes measured in the same way for treatment groups? (instrumentation / testing effects threats)	Yes	Yes	Yes
11. Were outcomes measured in a reliable way? (measurement bias)	Yes	Yes	Yes
12. Was appropriate statistical analysis used? (performance/detection bias)	Yes	Yes	Yes
13. Was trial design appropriate, and any deviations from the standard RCT design accounted for in the conduct and analysis of the trial? (design bias)	Yes	Yes	Yes

There are three quasi-experimental controlled studies reporting level 2.c evidence, and two pre-test and post-test studies reporting Level 2.d for effectiveness of experimental designs according to JBI Levels of Evidence criteria (JBI, 2013). The results of the critical appraisals and risks of bias of each quasi-experimental study are presented in Table 3.

Table 3
Results of critical appraisal for quasi-experimental studies

Questions (potential bias and threat)	Lin et al	O'Connor et al	Sayre et al	Pian-Smith et al	Warland et al
1. Is it clear in the study what is the 'cause' and what is the 'effect'? (causation/reverse causation)	Yes	Yes	Yes	Yes	Yes
2. Were the participants included in any comparisons similar? (selection bias)	Yes	Unclear	No	Unclear	No
3. Were the participants included in any comparisons receiving similar treatment/care, other than the intervention of interest? (history threat/ systematic difference/contamination bias)	Yes	Unclear	Unclear	Yes	Yes
4. Was there a control group? (measurement bias)	Yes	Yes	Yes	No	No
5. Was there multiple measurements of the outcome both pre and post the intervention? (maturation threat, regression to the mean)	Yes	Yes	Yes	No	No
6. Was follow-up complete, and if not, was follow-up adequately reported and strategies to deal with loss to follow-up employed? (attrition bias)	Yes	Yes	No	Unclear	Unclear
7. Were the outcomes of participants included in any comparisons measured in the same way? (instrumentation / testing effects threats)	Yes	No	Yes	Yes	Yes
8. Were outcomes measured in a reliable way? (detection / instrument / measurement bias)	Yes	Yes	Yes	Yes	Yes
9. Was appropriate statistical analysis used? (performance / detection bias)	Yes	Yes	Yes	Yes	Yes

3.4. Results of individual studies

Assertiveness communication training programs had a positive impact on clinicians' level of assertiveness and communication behaviours to some degree. The summary data for individual studies are presented in Table 4.

Table 4
Results of individual studies

	n Exp: Cntrl*	Model or test used	Result of test or measure of effect	P value	95% CI
Thomas et al.2008 RCT	n=32 17:15	Mann–Whitney rank sum, Binomial method, Cohen's k	Exp 1.80 Cntrl 0.64 Assertion k = 0.87	P<0.001	Exp(1.21, 2.25) Cntrl(0.26, 0.91) †
Raemer et al.2016 RCT	n=62-65 ‡ 31-32 : 31-33	Mann–Whitney U tests, chi-square §	NS for all scenarios tested	p=0.45 p=0.51 p=0.38	NR
Barzallo Salazar. et al.2014 RCT	n=55 28:27	Mann-Whitney U test, Fisher exact test, un-paired t test QC: adjusted personality bias	Encouraged group more likely to speak up 82% vs 30%	P<0.001	NR
Pian-Smith et al.2009 Quasi	n=36 single group	Wilcoxon signed rank test Pre vs post mean (SD)	Faculty anaesthesiologist 2.3(1.3) vs 3.6(1.2) Faculty surgeon 3.1(1.0) vs 3.9(1.0) Circulating nurse 2.7(1.2) vs 2.8(1.4)	P=0.0004 P=0.002 P=0.84	NR
O'Connor et al.2013 Quasi	<u>Repeated measures</u> **Knowledge** n=45 **Attitude ¶** Speaking up to seniors n=46	<u>Repeated measures</u> Pre vs post mean (SD) Paired-subjects t-tests. Cohen's d	<u>Repeated measures</u> 43.83(16.37) vs 63.84(14.44) t=6.97(df=44) 2.97(0.74) vs 3.20(0.68) t=1.40(df=45) Effect size between pre and post group: Cohen's d=0.33	 p<0 .05 NS	NR
	<u>Between subjects</u> **Knowledge** (pre: post: control 47:66:17) **Attitude ¶** Speaking up to seniors (46:67:17) **Behaviour** Admitting error (11:23:14) Breaking bad news (19:20:8)	<u>Between subjects</u> Pre vs post vs control Mean (SD),F statistic ANOVA QC: Reliability tested with Cronbach Cohen's d	<u>Between subjects</u> 44.68(16.61) vs 59.22(14.81) vs 43.85(9.22), $F_{(2, 127)}$=15.91 2.79 (0.68) vs 3.27 (0.64) vs 2.98 (0.69), $F_{(2 ,127)}$=7.2 Effect size between control and post: Cohen's d=0.47 23.45(1.51) vs 21.04(2.85) vs 21.07(3.69), $F_{(2, 45)}$=2.9 27.63(2.79) vs 27.65(3.33) vs 25.37(3.07), $F_{(2, 44)}$=1.8	 p< 0.05 p< 0.05 NS NS NS	
Sayre et al. 2012 Quasi	n=104 53:51	 Exp pre vs post mean (SD) Cntrl pre vs post mean (SD) QC: Cronbach alpha 0.81 #p controlled for group mean differences at baseline	<u>Speaking-up measure</u> 9.40(2.97) vs 21.00(2.28) 20.53(2.51) vs 20.39(2.43) <u>Individual nurse behaviours</u> 15.33(3.74) vs 17.24(4.38) 14.94(4.21) vs 15.19(4.44)	 P<0.0001 P=0.68 #p<0.001 P<0.0001 P=0.27 #p=0.0015	NR
Lin et al. 2004 Quasi	n=69 33:36	Exp/Cntrl Mean (SD) Pre vs post vs follow-up	119.58(12.56) vs 137.61(17.66) vs 147.70(15.33) 124.28(7.51) vs 133.33 (12.76) vs 34.64(11.84)		NR

		Generalized estimated equation (GEE) QC: Adjusted internal or external locus of control, sex role, time, group–time interaction	Z=2.53–4.71	p<0.05	
Warland et al.2014 Quasi	Overall n=39-29 under 25 n=23-17 over 25 n=14-12	Manne-Whitney U pre : post mean	68.8: 75.5 68.15: 75.49 68.8: 73.5	p=0.002 p=0.005 p=0.171	NR

* Exp: experimental, Cntrl: control; † graphical display; ‡ n varied depending on scenario; § two-tailed Fisher exact test; ¶ only data relevant to assertiveness is reported here; # p controlled; QC: quality control; NS: not significant; NR: not reported; SD: standard deviation

3.5. Risk of bias across studies

Methods taken to address risk of measurement, detection, attrition or selective bias are reported in Tables 2, 3 and 4.

The risk of selection bias was addressed through randomisation of participants to intervention or other in three RCTs. Randomisation procedures included random numbers generation (Barzallo Salazar et al., 2014, Thomas et al., 2007), the use of a random number table (Raemer et al., 2016) or sequential oblique envelopes (Barzallo Salazar et al., 2014), and/or the roll of a die (Raemer et al., 2016). Instructors delivering interventions were not blinded due to the nature of educational intervention studies. Two studies used a single-blinded design, one with participants (Barzallo Salazar et al., 2014), and another with outcome assessors (Thomas et al., 2007). One study randomly designated courses as experimental and control groups and outcome assessors were trained and blinded (Raemer et al., 2016).

Although randomisation reduces risks of selection bias, differences in demographic variables such as gender and age can still be confounding factors if participants are not evenly distributed across allocation. Two studies only reported some part of participants' demographics (Raemer et al., 2016, Thomas et al., 2007) so the degree of confounding could not be ascertained on those variables. In addition, in one study (Barzallo Salazar et al., 2014), the potential for personality bias was adjusted at baseline to counteract confounding as a result of personality characteristics observed in their pilot study. There was no statistically significant difference between groups in personality bias, training level or gender.

Two studies (Raemer et al., 2016, Thomas et al., 2007) reported loss to follow-up but the intention-to-treat analysis based on initially assigned groups was not reported. All RCTs used a simulation based outcome evaluation. In a study with an observer-based rating scale (Thomas et al., 2007), two trained observers were blinded to allocation and inter-rater reliability was tested. Thus, the quality of the RCTs was not high and did not satisfy all the JBI critical appraisal criteria.

Of the five quasi-experimental studies without random allocation, three studies were pre and post intervention studies with a control group (Lin et al., 2004, O'Connor et al., 2013, Sayre et al., 2012), and two used a single group (Pian-Smith et al., 2009, Warland et al., 2014). In one study, groups were matched by gender and grade; and other possible confounding factors such as internal/external locus of control were controlled for using a generalised estimated equation. Sustained impact was evaluated by a follow up measurement (Lin et al., 2004). Another study controlled for group mean differences at baseline using a regression analysis (Sayre et al., 2012). Although not randomised, these design and statistical approaches addressed possible bias.

4. DISCUSSION

4.1. Strength of evidence

JBI level of evidence for effectiveness for this review is Level 1.b – systematic review of RCTs and other study designs (JBI, 2013). Two main outcomes were evaluated – impact on clinician's communication behaviours and level of assertiveness. In regard to the former, there was a positive evaluation for the majority of the included studies, but these results were inconsistent depending on the participants or scenarios. The level of assertiveness was positively impacted but the results came only from quasi-experimental studies. Due to variation in intervention methods and outcome measures, it was not possible to conduct a meta-analysis. The strength of the evidence is suggestive but hampered by the complexity of the topic and the design heterogeneity of all included studies. Therefore, the findings are presented as a narrative review.

Assertiveness communication training programs targeting groups regarded as being low in hierarchical status were found to be effective. Conversely, a training program for experienced anaesthesiologists, a high status group, was ineffective (Raemer et al., 2016), possibly because assertiveness is deeply rooted in this discipline and therefore unlikely to change as a result of a relatively short, stand-alone 50-minute session. It should be noted that hierarchical status may not be the only reason for the ineffectiveness of this training program; program content and design are also likely to have contributed to the outcomes. Therefore, it cannot be concluded that assertiveness communication training programs were ineffective for high status groups.

Multi-method interventions were commonly used and effective in all but one of the included studies (Barzallo Salazar et al., 2014). Most programs used interactive rather than didactic approaches and lectures/presentations were reinforced by small group discussions and/or role plays. Video sessions were utilised by both RCTs and non-RCTs. In the RCT they were used to illustrate key concepts and skills (Thomas et al., 2007), whilst the two non-RCTs used videos of challenging situations in healthcare (O'Connor et al., 2013), and to share support messages from leaders (Sayre et al., 2012). Opportunities to exercise learnt skills were provided using role plays (Raemer et al., 2016, Warland et al., 2014) and when practicing clinical skills on manikins (Thomas et al., 2007). Other methods described in the studies included development of action plans and peer support (Sayre et al., 2012). However, it is not possible to determine whether all or some components of multiple-method interventions led to these positive outcomes, because all components were analysed inclusively. Nevertheless, using multiple educational formats was recommended as a strategy to maintain learners' interest and focus (Wilson and Korn, 2007).

Healthcare professionals and educators have recognised similarities between high-risk industries such as healthcare and aviation in terms of human errors such as communication being the root cause of the majority of incidents and accidents. However, the aviation industry has well advanced strategies for addressing this problem (Brindley and Reynolds, 2011, Kapur et al., 2016). Four studies conducted in the USA, two RCTs and two non-RCTs, were informed by aviation industry approaches such as Crew (cockpit/crisis) Resource Management (CRM) techniques,

teamwork skills training and communication techniques such as the ‘two-challenge rule’ and ‘advocacy-inquiry technique’ (O'Connor et al., 2013, Pian-Smith et al., 2009, Raemer et al., 2016, Thomas et al., 2007). Pian-Smith et al. (2009) combined the ‘two-challenge rule’ and ‘advocacy-inquiry technique’ to emphasise the shared responsibility for safety and the obligation to speak up when concerned. To reduce defensiveness residents were encouraged to challenge others by making an advocacy statement to describe their own opinions, followed by inquiry about the other person’s thinking and opinions. The residents’ performance improved significantly when communicating with anaesthesiologists and obstetricians, but not when communicating with nurses (Pian-Smith et al., 2009). This is a noteworthy finding and is in accord with Maxfield et al.’s (2005) finding that physicians were unlikely to confront nurses and other healthcare professionals even they have clinical authority. This may possibly reflect the hierarchical status mentioned previously and may be one of the reasons that assertiveness communication training in interprofessional settings is optimal. Nevertheless, integrating the approaches adapted from aviation industries to healthcare communication training is becoming common and reported to be effective, especially in the medical discipline. Additionally, Thomas et al. (2007) incorporated team training into an existing neonatal resuscitation program and attributed the positive result to the intervention being embedded in a speciality area. This result is in accord with previous studies (Healey et al., 2006, Yule et al., 2006), but it may not be relevant to training for students who have yet to specialise.

In three of the non-RCTs conducted with participants in nursing, midwifery and interprofessional settings (Lin et al., 2004, Sayre et al., 2012, Warland et al., 2014), assertiveness communication training programs were not embedded into a speciality area but were more general in nature. Researchers implemented conventional assertiveness training informed by cognitive behaviour therapy and included understanding of assertive rights, how to provide criticism, refusal and requests (Lin et al., 2004, Warland et al., 2014) and discussion about obstacles (Sayre et al., 2012). Thus, the duration of these workshops were lengthy and they were integrated into curricula, in comparison to shorter sessions provided for medical interns and residents (O'Connor et al., 2013, Pian-Smith et al., 2009, Thomas et al., 2007),

possibly due to the time constraints involved in training delivery to practicing clinicians (Gerard, 2011).

This review reports educational outcomes according to the first three levels of Kirkpatrick's model of evaluation of educational outcomes (Frye and Hemmer, 2012, Kirkpatrick, 2009), namely Level 1 - reactions, Level 2 - knowledge and attitude, and Level 3 - behaviour change. All of the RCTs (Barzallo Salazar et al., 2014, Raemer et al., 2016, Thomas et al., 2007) and two of the quasi-experimental studies (O'Connor et al., 2013, Pian-Smith et al., 2009), which were conducted with medical participants, attempted to go beyond the second level of Kirkpatrick's model, and behaviour change was assessed by observer-based rating scales using simulation in operating rooms or resuscitation settings.

The use of simulation-based outcome assessment has become prominent in healthcare research (Ryall et al., 2016). Although simulation approximates the reality of clinical practice, the actions taken or behaviours demonstrated in a simulated environment may differ from those in a real clinical context due to the lack of perceived responsibility and sense of urgency in simulation setting. Additionally, the unfamiliarity of the scenario setting and the time compression evident in a simulated scenario might influence participants' behaviours (Pian-Smith et al., 2009, Raemer et al., 2016). Reliability of the results of simulation also depends upon observer's training and inter-rater reliability. Despite evidence of behavioural change during simulation (Pian-Smith et al., 2009, Thomas et al., 2007), transfer of skills to clinical practice was not evaluated. Thus, sustained effects on assertive behaviour, the third level of the Kirkpatrick Model (2009) were not completely achieved. Nevertheless, it is evident that observer-based outcome measures with simulation can evaluate not only, reaction, knowledge and attitudes, but also behaviour change.

In three quasi-experimental studies with participants in nursing, midwifery and interprofessional settings (Lin et al., 2004, Sayre et al., 2012, Warland et al., 2014), researchers used validated assertive scales including the assertiveness questionnaire by Begley and Glacken (2004), the speaking-up measure by Premeaux and Bedeian (2003) and the assertive scale by Yang (1997) adapted from the Rathus Assertive Schedule (Rathus, 1973), which has been used in similar

studies (Ibrahim, 2011, Nishina and Tanigaki, 2013). These self-report questionnaires are designed to evaluate assertive attitudes but do not indicate actual changes in assertive communicative behaviours. The level of communication competence was not measured in any of the included studies.

Although some studies noted that their training approach had potential to enhance patient safety, none of the included studies measured the impact of interventions on patient safety using validated patient safety tools or in the form of tangible evidence such as the reduction of clinical errors or complications. Healthcare researchers have raised concerns about lack of patient-related outcomes (Abraham et al., 2014). Thus, future studies should endeavour to measure sustained impact on patient safety as well as healthcare professionals' behaviour change.

4.2. Implications for nursing researchers and educators

In all included studies training was delivered face-to-face. Although easy to access and cost effective, no e-learning programs were used as either the primary or supplementary intervention in any of the included studies. The underlying assumption for face-to-face approaches may be that communication training, including assertive communication, is more effective when participants are given opportunities for deliberate practice with the provision of immediate feedback (Sinclair et al., 2017). However, the potential for e-learning approaches has not been adequately explored and therefore, there are opportunities for this approach to be trialled and evaluated.

Although scenarios used for observer-based outcome measures were situated in an interdisciplinary team-setting in two studies (Pian-Smith et al., 2009, Raemer et al., 2016), only one quasi-experimental study targeted medical and nursing students in the experimental group and demonstrated a significant improvement in assertiveness skills with a sustained effect compared to the control group (Lin et al., 2004). Given the interdisciplinary nature of contemporary healthcare, there is a need for more studies that include participants from different disciplines and that evaluate the outcomes of interprofessional assertiveness communication training programs.

Culture may also influence the effectiveness of assertiveness communication training. The studies in this review were all conducted in Western countries including the USA, Ireland and Australia, with the exception of one non-RCT study conducted in Taiwan (Lin et al., 2004). The effectiveness of assertiveness training in Asian healthcare settings may not be transferable to Western healthcare settings and vice versa for several reasons including cultural differences and participants' baseline assertiveness levels.

Although it was noted in some studies that training approaches had the potential to enhance patient safety, none of the included studies measured the impact of interventions on patient safety using validated patient safety tools or in the form of tangible evidence such as the reduction of clinical errors or complications. Healthcare researchers have raised concerns about lack of patient-related outcomes (Abraham et al., 2014) thus future studies should endeavour to measure sustained impact on patient safety as well as healthcare professionals' behaviour change.

4.3. Implications for healthcare leaders and policy makers

Healthcare leaders play an important role in supporting less experienced staff to speak up when patient safety is threatened. In one RCT in a laparoscopic simulation setting, trainees who were encouraged to speak up by senior surgeons were more likely to express their concerns compared to those who were discouraged from doing so (Barzallo Salazar et al., 2014). Another study included medical and nursing leaders providing support for assertive communication and demonstrated a significant impact on participants' assertiveness scores (Sayre et al., 2012). Previous research has also emphasised the importance of support from hospital leadership on healthcare professionals' assertiveness (Churchman and Doherty, 2010, Okuyama et al., 2014, Rainer, 2015, Simpson and Lyndon, 2009). Expressions of support for open and assertive communication from key leaders in the organisation may further enhance the effectiveness of assertiveness communication training programs.

4.4. Limitations of the review

Due to heterogeneity in intervention methods and outcome measures between studies, it was not possible to synthesise the results using meta-analysis. Only papers written in English were included in this review but it is acknowledged that there may be relevant studies in other languages. Additionally, although this review was conducted using a rigorous protocol, the risk of overlooking a relevant recent paper was not completely eliminated. Only three RCTs were included, and the remainder were quasi-experimental studies. Quasi-experimental studies without random allocation are subject to selection bias and tend to overestimate intervention effects, however, they still provide a rigorous methodology and relevant data.

5. Conclusions

This review has identified that interventions to improve assertive communication demonstrated some effectiveness with all target groups except experienced anaesthesiologists. Face-to-face and multi-methods programs in which didactic instructions reinforced by discussions and role-play, team training, and support from leaders optimised the effectiveness of assertiveness communication training programs. What is less well understood is which component/s of multi-method interventions had the most impact on outcomes. Safety communication strategy adapted from aviation industries to healthcare are reported to have an impact on novice medical clinicians' behaviours. Conventional assertiveness training in non-RCTs for nurses and students also resulted in significant improvements in the level of assertiveness using self-perceived validated scales, however, impact on behaviours was not examined. There is also evidence of effectiveness of discipline specific assertiveness training programs, but there is a need for more research focusing on evaluating the effectiveness of interprofessional assertiveness communication training programs. The evidence presented by this review, although limited, was suggestive of positive outcomes and identified the need for well-designed RCTs to continue expanding this valuable and emerging field of research. Future research should therefore focus on more rigorous designs, endeavour to identify the component/s of multi-method interventions that have maximal and sustained effect particularly on behaviour change and ultimately on patient safety.

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