

# BMJ Open Can SBAR be implemented with high fidelity and does it improve communication between healthcare workers? A systematic review

Lisha Lo ,<sup>1</sup> Leahora Rotteau,<sup>1</sup> Kaveh Shojania<sup>1,2</sup>

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<sup>1</sup>Centre for Quality Improvement and Patient Safety, University of Toronto, Toronto, Ontario, Canada

<sup>2</sup>Department of Medicine, University of Toronto, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada

## Correspondence to

Lisha Lo; [lisha.lo@sickkids.ca](mailto:lisha.lo@sickkids.ca)

## ABSTRACT

**Objective** To characterise the extent to which health professionals perform SBAR (situation, background, assessment, recommendation) as intended (ie, with high fidelity) and the extent to which its use improves communication clarity or other quality measures.

**Data sources** Medline, Healthstar, PsycINFO, Embase and CINAHL to October 2020 and handsearching selected journals.

**Study selection and outcome measures** Eligible studies consisted of controlled trials and time series, including simple before-after design, assessing SBAR implementation fidelity or the effects of SBAR on communication clarity or other quality measures (eg, safety climate, patient outcomes).

**Data extraction and synthesis** Two reviewers independently abstracted data according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses on study features, intervention details and study outcomes. We characterised the magnitude of improvement in outcomes as small (<20% relative increase), moderate (20%–40%) or large (>40%).

**Results** Twenty-eight studies (3 randomised controlled trials, 6 controlled before-after studies, and 19 uncontrolled before-after studies) met inclusion criteria. Of the nine studies assessing fidelity of SBAR use, four occurred in classroom settings and three of these studies reported large improvements. The five studies assessing fidelity in clinical settings reported small to moderate effects. Among eight studies measuring communication clarity, only three reported large improvements and two of these occurred in classroom settings. Among the 17 studies reporting impacts on quality measures beyond communication, over half reported moderate to large improvements. These improvements tended to involve measures of teamwork and culture. Improvements in patient outcomes occurred only with intensive multifaceted interventions (eg, early warning scores and rapid response systems).

**Conclusions** High fidelity uptake of SBAR and improvements in communication clarity occurred predominantly in classroom studies. Studies in clinical settings achieving impacts beyond communication typically involved broader, multifaceted interventions. Future efforts to improve communication using SBAR should first confirm high fidelity uptake in clinical settings rather than assuming this has occurred.

## Strengths and limitations of this study

- We undertook this systematic review in accordance with the Cochrane Collaboration standards using a validated tool to assess the quality of identified studies.
- We considered SBAR (situation, background, assessment, recommendation) implementation strategies and its potential impact on fidelity to SBAR, clarity of communication and other quality-related measures.
- The included studies were too heterogeneous to test for publication bias or to perform a meta-analysis.

**PROSPERO registration number** CRD42018111377.

## INTRODUCTION

Analyses of adverse events and other critical incidents commonly identify communication failures between healthcare providers as major contributing factors.<sup>1–4</sup> Standardised, structured communication techniques have emerged as a potential solution to these recurring problems.<sup>5,6</sup> The mnemonic SBAR (situation, background, assessment, recommendation) constitutes the most well-known such technique.<sup>7</sup> Borrowed from the US Navy where it was applied as a hierarchy-flattening approach to communicating situation reports, SBAR was initially adopted in healthcare to guide conversations between nurses and physicians about issues that required immediate attention.<sup>5,8</sup> SBAR has since been widely promoted, by organisations such as the Institute for Healthcare Improvement<sup>9</sup> and the National Health Service,<sup>10</sup> to enhance communication.

A recent systematic review drew attention to the mixed impacts of SBAR on patient outcomes and patient safety and the lack of high-quality studies.<sup>11</sup> This review usefully highlighted the discordance between the limited evidence supporting SBAR and the

widespread recommendations to use it. Yet, the review only included studies reporting impacts on patient outcomes. While patient outcomes represent the bottom line for any improvement intervention, we do not want to dismiss potentially effective interventions just because they have not yet improved patient outcomes. We do not know, for instance, if the mixed results of SBAR on patient outcomes reflect problems with implementation (eg, SBAR as implemented may not reflect the intended approach to communication). Alternatively, even when implemented as intended, SBAR may not improve communication to an extent sufficient to improve patient outcomes.

In undertaking this systematic review, we sought to characterise gaps in the existing literature for SBAR as a strategy for improving communication and patient safety more generally. We sought to determine the extent to which users perform SBAR as intended (ie, with high fidelity) and the extent to which SBAR improves clarity of communication. We also looked for examples of interventions using SBAR showing impacts on other quality-related measures.

## METHODS

We registered the study protocol (CRD42018111377 Available from: [http://www.crd.york.ac.uk/PROSPERO/display\\_record.php?ID=CRD42018111377](http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42018111377)) in November 2018 following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses recommendation.<sup>12</sup>

### Search strategy and study selection

Using the search strategy outlined in appendix A, we searched Medline, Healthstar, PsycINFO, Embase and CINAHL databases for studies evaluating SBAR (or variants of the standard mnemonic). The last search date was 23 October 2020.

We applied the following inclusion and exclusion criteria to all original research articles on SBAR.

Inclusion criteria were:

- ▶ SBAR was taught or implemented as the framework to structure verbal communication between healthcare providers or trainees delivering care to any patient population. We allowed studies of SBAR as a standalone intervention as well as those which explicitly identified SBAR as a component of a multifaceted intervention.
- ▶ Study design of a controlled trial (randomised or not) or time series, including simple before–after studies.
- ▶ Study assessed one of the following eligible outcomes: fidelity to SBAR (eg, measures of adherence to the mnemonic during communication), clarity of communication, clinical outcomes, or measures of quality, such as teamwork and patient safety climate assessed by validated instruments.

For measures of fidelity and clarity of communication, we required assessment by two independent observers. We accepted outcomes ascertained by a single reviewer

if the authors confirmed inter-rater agreement of at least moderate reliability (eg, kappa >0.4) on a subset of at least 10% of total observations. We applied this requirement given the subjective judgments underpinning these measures.

Exclusion criteria were:

- ▶ Studies with no control group (eg, studies reporting only postintervention results for a single group and head-to-head trials of different versions of SBAR).
- ▶ Outcomes obtained solely from incident reporting, given that incident reporting reflects reporting behaviour and safety culture far more than the actual frequency of any given adverse event.<sup>13</sup>
- ▶ Studies from the grey literature or published solely as conference abstracts, as they offered too few details about SBAR training and implementation and also omitted key methodological details such as how communication clarity was judged.

Two reviewers (LL, LR) applied the above criteria in two stages: first independently screening abstracts of retrieved articles and then independently reviewing the full text of each potentially eligible article. Independent screenings of title and abstracts for inclusion achieved excellent inter-rater agreement (kappa=0.81, 95% CI 0.77 to 0.86).<sup>14</sup> Agreement about inclusion at the stage of full-text review also achieved substantial inter-rater agreement (kappa=0.76, 95% CI 0.67 to 0.86).

### Quality assessment

Two investigators (LL, LR) independently assessed randomised controlled trials (RCTs) using the six domains from the revised Cochrane risk-of-bias tool for randomised trials<sup>15</sup> and non-RCTs using the seven domains from the Cochrane Risk Of Bias In Non-Randomized Studies of Interventions tool.<sup>16</sup> We resolved disagreements through consensus, involving a third investigator (KS) as needed, and excluded studies judged to have ‘critical risk’ of bias, as recommended by the Cochrane Collaboration.<sup>16</sup> Online supplemental appendix B table 1 lists all studies excluded for critical risk of bias as well as a representative list of other excluded articles along with reasons for their exclusions.

### Data extraction and synthesis

Two reviewers (LL, LR) independently abstracted data from included studies onto a piloted data collection form and resolved disagreements through arbitration by a third reviewer (KS). We extracted the first author, year of publication, country, participant profession, clinical setting, study design, type of communication for which SBAR was used, details around SBAR implementation and training, study outcomes and study limitations. For studies reporting impact beyond clarity of communication, we also documented the stated study purpose and any proposed mechanism by which SBAR would influence the selected quality measures. For missing or unclear data elements, we emailed corresponding authors for clarification, receiving 5 responses from 10 such queries.

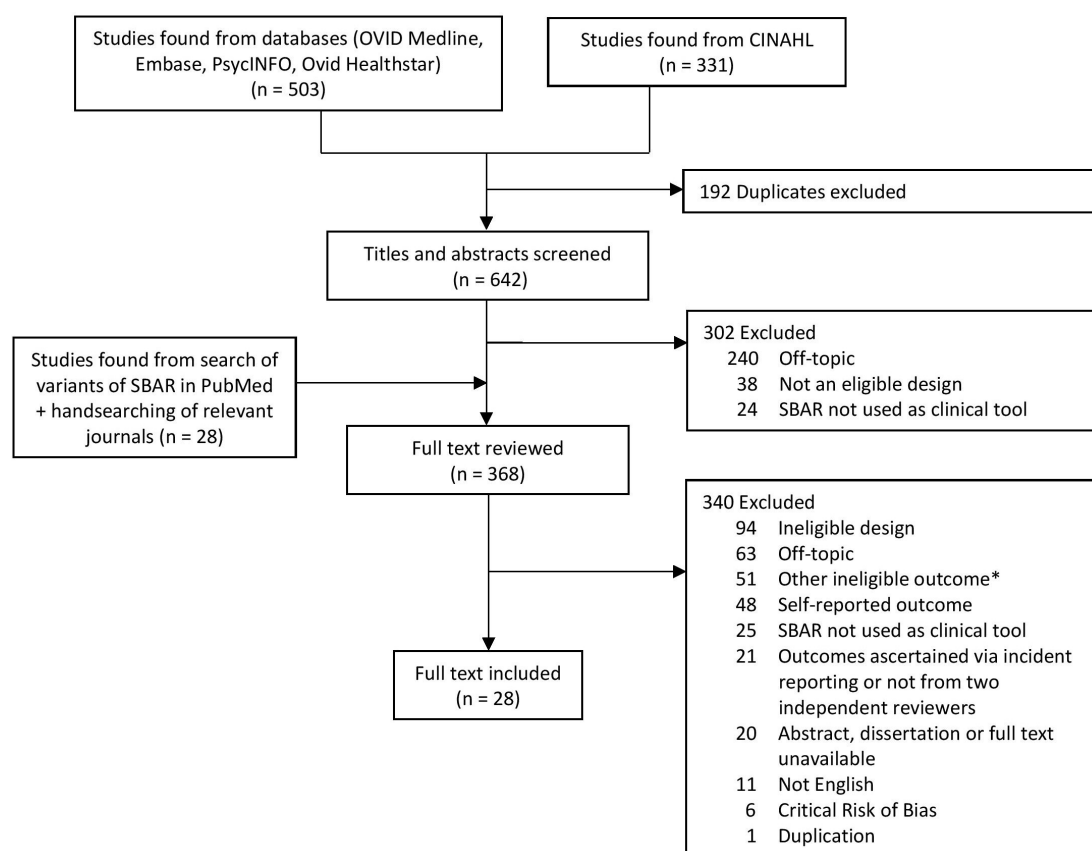
As outlined in the registered protocol for the review, we planned to undertake quantitative synthesis of included studies if they did not exhibit substantial heterogeneity. Once we saw the wide variation in clinical settings, target populations, study designs, complexity of SBAR interventions and measures of impact in the included studies, we realised that the substantial heterogeneity would preclude quantitative synthesis using meta-analysis. We thus undertook a more qualitative approach to data synthesis. Yet, we still sought to characterise the impact of SBAR interventions more concretely, so defined categories conveying the magnitude of effect reported for each included outcome. We defined relative improvements <20% as ‘small’, relative improvements in the range of 20%–40% as ‘moderate’ in size, and improvements >40% as ‘large’. For implementation fidelity, we also noted whether the improvement achieved an absolute fidelity threshold of at least 80%. While no well-established threshold for fidelity exists, the potential effect size from any intervention decreases with lower levels of fidelity.<sup>17</sup>

## RESULTS

The database search retrieved 642 unique citations. After screening titles and abstracts, we reviewed 340 full-text articles, 34 of which met inclusion criteria. We excluded 6

articles judged to have critical risk of bias<sup>18–23</sup> (see online supplemental appendix B table 1), leaving a total of 28 articles reporting 27 studies (figure 1). These included 3 RCTs,<sup>24–26</sup> 6 controlled before–after studies,<sup>27–32</sup> and 19 uncontrolled before-and-after comparisons<sup>33–51</sup> (table 1). Online supplemental appendix B table 2 presents an overview of the 28 articles, including details of the study purpose and intervention, and outcomes included in the review. For these 28 studies, 5 (18%) had low risk of bias; 1 scored as ‘some concerns’; 17 (60%) exhibited moderate risk; and, 5 (18%) had serious risk of bias (online supplemental appendix B figure 1A,B).

Twenty-four studies evaluated the impact of SBAR and/or the fidelity of its implementation in the clinical setting<sup>24,28–43,45–51</sup> and four in classroom settings.<sup>25–27,44</sup> Most studies in the clinical setting (20/24; 83%) took place in hospitals, including medical and surgical wards<sup>27,35,40–42,49,52</sup> and post-anaesthesia care units.<sup>28,29,33</sup> As shown in table 1, 13 studies used SBAR to improve communications related to changes in patient status or obtaining immediate help with patients.<sup>24–27,32,38–40,42,44,46,50,51</sup> Other applications included communication during multidisciplinary rounds, handovers between wards, shift change and patient transfers.<sup>28–30,33–37,41–43,45,47–49</sup> Four targeted more than one type of communication.<sup>32,41,42,46</sup>



**Figure 1** Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram of included studies depicting steps of identification, screening, eligibility and inclusion. \*Outcomes not of interest, in unreportable format, cannot be disentangle, or no reported outcomes at all. SBAR, situation, background, assessment, recommendation.

**Table 1** Characteristics of 28 included articles

Characteristics	N (%)
<b>Country</b>	
USA	9 (32)
Europe	6 (21)
Australia	5 (18)
Canada	4 (14)
Other	4 (14)
<b>Study design</b>	
Randomised controlled trial	3 (11)
Controlled before-and-after	6 (21)
Uncontrolled before-and-after	19 (68)
<b>Type of communication SBAR was applied to improve</b>	
Handover between wards, handover at shift change and patient transfers	16 (57)
Changes in patient status or obtaining immediate help with patients	13 (46)
Other (general communication, multidisciplinary rounds)	3 (11)
<b>Disciplines involved in the communication</b>	
Interdisciplinary	15 (54)
Nurse to physician	12 (80)
Other	3 (20)
Intradisciplinary	15 (54)
Nurse to nurse	9 (60)
Physician to physician	6 (40)
<b>Type of outcomes reported</b>	
Fidelity of SBAR use	9 (32)
In classroom setting	4 (44)
Clarity of communication	8 (28)
In class room setting	3 (38)
Impact beyond communication	17 (61)

Most studies in clinical settings (17/24; 71%) focused on communication involving nurses, including nurse-to-physician,<sup>24 38–40 42 47 50 51</sup> nurse-to-nurse<sup>27 33 34 41 42 46 48 49</sup> and nurse-to-allied health communications.<sup>41</sup> Two studies targeted physician-to-physician communication,<sup>35 45</sup> though four studies in classroom settings aimed to improve communication between trainees and more senior physicians.<sup>25 26 30 44</sup>

### Fidelity to SBAR technique

Nine studies<sup>25–27 35–37 44 45 47</sup> assessed the degree to which participants used SBAR as intended, including four studies in classrooms and five in clinical settings (table 2). Investigators typically operationalised fidelity as a composite score based on adherence to predetermined elements of the SBAR mnemonic as assessed by two observers. Studies assessing fidelity varied in the time allotted for SBAR training, from as little as 10 min<sup>25</sup> to a

full-day session,<sup>37</sup> but typically reported training sessions of 30–60 min. Most studies<sup>25 26 35–37 45</sup> employed reminder aids, such as pocket cards or posters, to facilitate SBAR uptake. All studies in classroom settings<sup>25–27 44</sup> and three of five in clinical settings<sup>35 45 47</sup> assessed fidelity to SBAR immediately after training. For the remaining two in clinical settings, one<sup>36</sup> assessed fidelity 2 months and another<sup>37</sup> 2 years after training. In the clinical setting, the data collection period ranged from 4 weeks to a year.

Three of the four studies of SBAR implementation in classroom settings demonstrated large improvements in fidelity to SBAR,<sup>26 27 44</sup> whereas all five studies in clinical settings reported small to moderate improvements in fidelity (table 2). Only three studies<sup>26 37 47</sup> achieved fidelity of at least 80%. One of these studies reported a baseline of 78% fidelity<sup>37</sup> so the post-intervention fidelity of 83% constituted a marginal improvement. Only two studies reported large relative improvements in fidelity and also achieved an absolute fidelity of at least 80%.<sup>26 37</sup> These studies both used role-playing in addition to didactic methods for their SBAR training. Two other studies using role-playing fell short of 80% fidelity but both did report large effect sizes.<sup>27 44</sup>

### Clarity of communication

Eight studies<sup>25–27 29 35 37 47 51</sup> evaluated the clarity of communication using SBAR (table 3). Half of these studies used implicit assessments<sup>25 35 37 47</sup> or global ratings of communication. The others judged clarity of communication using explicit criteria, such as conveying specific elements of information<sup>26 27 37</sup> or recall of information by receivers of communication.<sup>29 51</sup>

Studies assessing clarity of communication varied in the time allotted for SBAR training, from as little as 10 min<sup>25</sup> to a full-day session,<sup>37</sup> with most reporting role-playing as part of the training.<sup>26 27 29 37 51</sup> Most studies employed reminder aids, such as pocket cards or posters, to facilitate SBAR uptake<sup>25 26 29 35 37 47 51</sup>—one also had the SBAR template clinically embedded in the workflow.<sup>35</sup>

Six studies assessed both clarity of communication and fidelity to SBAR.<sup>25–27 35 37 47</sup> The studies in the classroom setting<sup>25–27</sup> demonstrated moderate to large improvements in clarity of communication, with the level of fidelity reached ranging from 71% to 87%. In contrast, studies in clinical settings<sup>35 37 47</sup> demonstrated no improvement to moderate improvements in clarity, with fidelity ranging from 53% to 83%.

### Impacts beyond communication

Seventeen studies<sup>24 28 30–34 38–43 46 48–50</sup> reported the impact of SBAR on quality measures beyond clarity of communication (see online supplemental appendix B table 3). Unfortunately, none of these studies also assessed communication clarity or fidelity.

Ten studies reported on patient outcomes,<sup>24 30 38–43 48 50</sup> including mortality,<sup>39 40 42</sup> unplanned ICU admissions,<sup>40 42</sup> cardiac arrests,<sup>40 43</sup> adverse events,<sup>24 30</sup> hospital readmission,<sup>41</sup> urinary catheter

**Table 2** Studies evaluating fidelity of SBAR uptake

Author, year	Main intervention	Fidelity measure	Time of fidelity assessment post training	Reported results	Magnitude of improvement (qualitative size)	Fidelity reached 80%?
<b>Classroom-based studies</b>						
Cunningham <i>et al</i> 2012 <sup>25</sup>	10-min 1-on-1 didactic SBAR training for 69 junior physicians on medical/surgical wards and emergency departments for physician-physician telephone referral	Total item score of SBAR elements from 66 audio recordings	Immediately after training	SBAR exposure: 8.5 versus control: 8.0 on 12-point scale, p=0.051	6% (Small)	No (71%)
Marshall <i>et al</i> 2009 <sup>26</sup>	40-min ISBAR training (including role playing) for 17 teams of medical students for physician-physician telephone referral	Total item score of ISBAR elements from 17 video and audio recordings	Immediately after training	SBAR exposure: 17.4 versus control: 10.2 on 20-point scale, p=0.001	71% (Large)	Yes (87%)
McCrorry <i>et al</i> 2012 <sup>44</sup>	45-min didactic ABC-SBAR training for 26 paediatric interns for physician-physician communication for immediate help for patient	Total item score of ABC-SBAR elements and format from 52 video recordings	Immediately after training	3.1 to 7.8 on 10-point scale, p<0.001	152% (Large)	No (78%)
Uhm <i>et al</i> 2019 <sup>27</sup>	4-hour SBAR training (including role-playing) embedded in 1-week practicum for 81 nursing students for nurse-physician communication for help for patient	Total item score of SBAR elements from 81 audio recordings	Immediately after training	SBAR exposure: 17.6 versus control: 9.0 on 24-point scale, p<0.001	96% (Large)	No (74%)
<b>Studies in clinical setting</b>						
Shahid <i>et al</i> 2020 <sup>47</sup>	Implementation of a modified SBAR tool and didactic training with videos for 10 nurses over 1 month for nurse-physician communication during interfacility neonatal transports	Total item score of SBAR elements from 165 audio recordings	Assessment began immediately after training but was ongoing over 1 year period	21.7 to 30.2 on 38-point scale, p≤0.001	39% (Moderate)	Yes (80%)
Smith <i>et al</i> 2018 <sup>35</sup>	SBAR-DR implementation, electronic handover template, and 30min didactic training with videos and demonstrations for 68 physicians in emergency department for physician-physician telephone communication at admission handover	Total item score of SBAR-DR elements and format from 220 audio recordings	Assessment began immediately after training but was ongoing over 60-day period	7.6 to 8.4 on 16-point scale, p=0.009	12% (Small)	No (53%)
Thompson <i>et al</i> 2011 <sup>45</sup>	ISBAR implementation and 1-hour training held at 4 separate times for 44 junior med officers over 4 weeks for physician-physician at after-hour handover on in-patient ward	Total item score of ISBAR elements from 63 audio recordings	Assessment began immediately after training but was ongoing over 4 week period	9.2 to 10.4 on a 19-point scale, p=0.004	13% (Small)	No (55%)
Uhm <i>et al</i> 2018 <sup>36</sup>	SBAR implementation and didactic training (duration not reported) for 102 nurses for nurse-nurse handover from paediatric cardiac ICU to cardiac ward	Total item score of SBAR elements from 59 audio recordings	Assessment began 2 months after training but was ongoing over 40-day period	2.3 to 2.9 on 4-point scale, p<0.001	25% (Moderate)	No (73%)
Wilson <i>et al</i> 2017 <sup>37</sup>	SBAR implementation and full day training (including role playing) over 1 month for nurses-physician-respiratory therapist communication during interfacility neonatal and paediatric transports	Total item score of SBAR elements from 187 audio recordings	Assessment began 2 years after training but was ongoing over 7 month period	7.0 to 8.3 on 10-point scale, p<0.001	19% (Small)	Yes (83%)

ABC-SBAR, airway, breathing, circulation followed by SBAR; ICU, Intensive Care Unit; ISBAR, Identification of self followed by standard SBAR; SBAR, situation, background, assessment, recommendation; SBAR-DR, Situation, Background, Assessment, Responsibilities & Risk, Discussion & Disposition, Read-back & Record.

Table 3 Effect of SBAR on clarity of communication

Author, year	Study design	SBAR training	Objective of communication	Measure of quality of communication	Reported results	Relative improvement (qualitative size)
<b>Classroom-based studies</b>						
Cunningham <i>et al</i> 2012 <sup>25</sup>	RCT	10-min didactic session explaining the SBAR method of clinical handover and its application in telephone referrals immediately prior to test scenario	Contacting senior member of staff via telephone (medical or surgical registrar) to refer a medical patient with chest pain or surgical patient with abdominal pain	Implicit assessment: ability 'to get the message across' as measured by 4-point scale for poor, fair, good or excellent as judged by a senior clinician reviewing 66 audio recordings, with a second clinician independently reviewing 30%	SBAR exposure: 3.0 versus control: 2.0 on 4-point scale, p=0.003	50% (Large)
Marshall <i>et al</i> 2009 <sup>26</sup>	RCT	40-min ISBAR training (including role-playing) for 17 teams of medical students learning how to communicate in telephone referrals to more senior physicians	Contacting senior colleague via telephone for assistance with management of an unstable trauma patient in high fidelity simulation centre	Explicit assessment: clarity and delivery of communication as measured by rating referral according to the presence of elements of quality (eg, coherence, conciseness, etc) as judged by senior clinician reviewing 17 video and audio recordings (a second clinician reviewed first half to ensure adequate agreement)	SBAR exposure group had higher score on 5-point scale for clarity as measured by Spearman rank correlation ( $r=0.903$ ), p=0.001	N/A (large based on r statistic >0.5)
<b>Studies in clinical setting</b>						
Uhm <i>et al</i> 2019 <sup>27</sup>	Controlled before–after	4-hour SBAR training (including role-playing) embedded in 1-week practicum for nursing students for various nurse–physician communications	Notifying physician about patient's status of bronchiolitis with desaturation or acute gastroenteritis with severe dehydration	Explicit assessment: clarity of communication according to presence of elements of quality (eg, coherence, conciseness, etc) as judged by two investigators independently reviewing 81 audio recordings	SBAR exposure: 29.9 versus control: 22.4 on 40-point scale, p<0.001	33% (Moderate)
Randmaa <i>et al</i> 2016 <sup>28</sup>	Controlled before–after	SBAR implementation and 2.5-hour training (including role-playing) for nurses and physicians for nurse–nurse communication at rounds or shift change and nurse–physician communication at rounds or handover	Nurse–nurse communication at rounds or shift change and nurse–physician communication at rounds or handover	Explicit assessment: percentage of recalled information sequences by receivers as measured by counting identified sequences from 164 audio recordings and observations	SBAR exposure: 43.4% to 52.6% - ( $\uparrow$ 9.2%) Control: 51.3% to 52.6% - ( $\uparrow$ 1.3%) Not significant (p value not reported)	18% (Small)
Shahid <i>et al</i> 2020 <sup>17</sup>	Uncontrolled before–after	Implementation of a modified SBAR tool and didactic training with videos for 10 nurses for nurse–physician communication during interfacility neonatal transports	Neonatal transport cases	Implicit assessment: global rating score as measured by rating the quality of the handover using 165 audio recordings	3.0 to 3.9 on 5-point scale, p<0.001	30% (Moderate)
Smith <i>et al</i> 2018 <sup>35</sup>	Uncontrolled before–after	SBAR-DR implementation and 30-min didactic training with videos and demonstrations for 68 physicians in emergency department for physician–physician telephone communication at admission handover	Physician–physician telephone communication at admission handover	Implicit assessment: global rating score as measured by rating on an anchored scale using 220 audio recordings	2.9 to 3.1 on 5-point scale, p=0.236	5% (Small)

Continued

Table 3 Continued

Author, year	Study design	SBAR training	Objective of communication	Measure of quality of communication	Reported results	Relative improvement (qualitative size)
Vltos and Kamara 2016 <sup>51</sup>	Uncontrolled before-after	Implementation of a modified SBAR tool and training (including role-play) for nurses for nurse-physician communication between ward staff and physicians on duty	Contacting physician on duty via telephone for triaging cases	Explicit assessment: percentage of physicians given adequate information to safely triage cases measured using 103 audited calls	58% to 84%, p value not reported	45% (Large)
Wilson et al 2017 <sup>37</sup>	Uncontrolled before-after	SBAR implementation with reminder tools and full-day training (including role-playing) for nurses-physician-respiratory therapist communication during interfacility neonatal and paediatric transports	Paediatric transport cases	Explicit assessment: integration of content as measured by scoring on tool for related items using 187 audio recordings Implicit assessment: global rating score as measured by rating the handover using 187 audio recordings	7.3 to 8.4 on 10-point scale, p<0.001 3.4 to 3.9 on 5-point scale, p<0.001	16% (Small) 15% (Small)

ISBAR, identification of self followed by SBAR; RCT, randomised controlled trial; SBAR, situation, background, assessment, recommendation; SBAR-DR, Situation, Background, Assessment, Responsibilities & Risk, Discussion & Disposition, Read-back & Record.

removal<sup>41</sup> and patient satisfaction,<sup>41 48</sup> among others. Of these 10 studies, 7 reported moderate or large improvements for at least one outcome.<sup>39–43 48 50</sup> In five of these studies, SBAR constituted just one facet of broader, intensive initiatives that included a structured process to assess patient status, such as an early warning system protocol<sup>39 40 42 43</sup> or readmission risk assessment and daily interdisciplinary rounds<sup>41</sup> that may in itself have greater power to influence such patient outcomes.

Two studies reported on changes in provider behaviours, including small relative improvements in duplicated, cancelled and wrong patient order entries,<sup>30</sup> and a large relative improvement (8.3% to 16.7%, p<0.001) in the recognition of adverse events by nurses in postanesthesia care units.<sup>33</sup> Two studies measured organisational efficiency, reporting large relative improvements (though without testing for significance) in some measures of bed assignment and patient turnover.<sup>34 49</sup>

Five studies reported on teamwork,<sup>38 46</sup> safety climate<sup>28 38 46</sup> and patient safety culture.<sup>31 32</sup> Two studies<sup>28 38</sup> reported a small significant improvement in safety climate and moderate significant improvement in teamwork. Two studies found small to moderate significant improvements in patient safety culture dimensions of organisational learning, feedback and communication about error, and teamwork across hospital units.<sup>31 32</sup>

## DISCUSSION

Overall, we found that teaching SBAR technique to healthcare providers can promote high fidelity uptake. Importantly, however, studies of SBAR implementation reporting large improvements in fidelity<sup>26 27 44</sup> all occurred in classroom settings. Conversely, the five studies assessing SBAR fidelity in clinical settings reported small to moderate improvements. Only two studies,<sup>26 37</sup> both in the classroom setting, reported large relative improvements in fidelity and also achieved an absolute fidelity of at least 80%, a minimum fidelity suggested for intervention impact.<sup>53</sup>

Additionally, we found that teaching the SBAR technique to healthcare providers can improve clarity of communication, in both classroom and clinical settings. Most of the studies in the classroom setting demonstrated large improvements in clarity, whereas four of the five studies in the clinical setting reported only small to moderate improvements.<sup>29 35 37 47</sup> These findings suggest greater challenges of improving clarity of communication in the clinical setting compared with the classroom, potentially related to increased distractions and competing priorities inherent in clinical practice. The better results from classroom-based studies may also indicate a recency effect. Classroom studies assessed outcomes immediately after training. Studies in clinical settings necessarily measured outcomes, including fidelity of uptake and clarity of communication, over weeks to months. It is also possible that a greater Hawthorne effect occurred in classroom-based evaluations compared with studies in clinical settings.

Six of the included studies measured both fidelity to SBAR and clarity of communication, and their results again highlighted the difference between studies in classrooms versus clinical settings. Classroom-based studies achieved levels of fidelity ranging from 71% to 87% and reported moderate to large improvements in clarity of communication. Again, this difference may reflect the immediacy of the fidelity assessments following training in the classroom-based studies and/or a greater Hawthorne effect. The studies in clinical settings<sup>35 37 47</sup> demonstrated no improvement to moderate improvements in clarity, with fidelity ranging from 53% to 83%.

The lesser improvements in communication clarity seen in studies from clinical settings suggest the need for establishing higher levels of fidelity to SBAR as intended. Proceeding directly to implementation without confirming fidelity, or exposing clinicians to SBAR solely in classroom settings, seems unlikely to produce the intended improvements in communication. None of the SBAR interventions included in this review incorporated audits or other monitoring of SBAR use, potentially limiting impact of SBAR on both communication and quality of care.<sup>54</sup>

The challenges of achieving clinically impactful improvements in clarity of communication may, in part, explain our findings and others'<sup>11</sup> that there are mixed impacts of SBAR on outcomes beyond communication. SBAR education and implementation positively enhanced safety culture and teamwork,<sup>28 31 32 38</sup> while the relationship with other clinical outcomes was less straightforward. Studies that embedded SBAR as a component of a larger initiative, such as an early warning system protocol<sup>39 40 42 43</sup> or readmission risk assessment and daily interdisciplinary rounds,<sup>41</sup> demonstrated larger impacts on patient outcomes, compared with those that implemented SBAR on its own. Unfortunately, none of the studies aimed at outcomes beyond communication<sup>24 28 30–34 38–43 46 48 49</sup> assessed SBAR fidelity or clarity of communication. Thus, we cannot know if the multifaceted interventions achieved their impacts because they implemented SBAR successfully or because of the other components of these interventions, such as early warning scores and rapid response systems.

### Limitations

A limitation of this study is the variable quality of research in this domain. One frequently cited study<sup>18</sup> lacked basic information about the basis for choosing the outcomes reported and how relevant data were obtained. Even after excluding that study and five others with critical risk of bias, 60% of included studies exhibited moderate risk of bias and 18% had high risk. Another limitation of the study is the heterogeneity in the types of communication activities targeted, compounded by variation in the interventions—from SBAR on its own to SBAR as just one part of an intensive multifaceted initiative. A final limitation is the likelihood of publication bias, such that additional studies reporting poor fidelity or no improvements in communication clarity may have gone unpublished.

### CONCLUSION

Our study adds to the growing consensus that the impact of SBAR is variable. We provide a more nuanced analysis of reasons for these findings by showing that uptake of SBAR with high fidelity cannot be taken for granted. Fidelity appears reasonably easy to achieve in classroom settings. But, studies in clinical contexts either did not achieve sufficient improvements in fidelity or they simply skipped assessing it. Organisations have promoted the use of SBAR for a range of communication and nurses are often told to use it in all clinical communications. If organisations want to achieve the intended impact of SBAR, they need to attend to its implementation and ongoing monitoring. As with any improvement intervention, one cannot assume that uptake will occur smoothly or as intended.

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### ORCID iD

Lisha Lo <http://orcid.org/0000-0002-3875-4372>

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