The impact of a 22-month multi-step implementation programme on speaking-up behaviour in an academic anaesthesia department

Fabio Walther [1,*], Carl Schick [1,*], David Schwappach[2,3], Evgeniya Kornilov [4], Sharon Orbach-Zinger [4], Daniel Katz [5], Michael Heesen [1]

[1]Department of Anaesthesiology, Kantonsspital Baden, Baden, Switzerland

[2]Swiss Patient Safety Foundation, Zürich, Switzerland

[3]Institute of Social and Preventive Medicine, University of Bern, Switzerland

[4]Department of Anaesthesia, Beilinson Hospital, Tel Aviv University, Tel Aviv, Israel

[5]Department of Anaesthesiology, Perioperative and Pain Medicine, Mount Sinai, New York, USA

*These authors contributed equally to this work and share first authorship: F.W. and C.S.

Corresponding Author

Fabio Walther

Im Ergel 1

5405 Baden

fabio.walther@ksb.ch

0041 76 671 01 61

Running title: the effect of a 22-Month speaking-up programme

Abstract

Background

Speaking-up is a method of assertive communication, which increases patient safety, but often encounters barriers. Numerous studies describe programmes introducing speaking-up with varying success; the common denominator seems to be the need for a multimodal and sustained approach in order to achieve the required change in behaviour and culture for safer healthcare.

Methods

Before implementing a 22-month multistep programme for establishing and strengthening speaking-up at our institution, we assessed perceived safety culture using the "Safety Attitudes Questionnaire". After programme completion, participants completed parts of the same "Safety Attitudes Questionnaire" relevant to speaking-up, and pre- and post-results were compared. Additionally, levels of speaking-up and assertive communication were compared with a Swiss benchmark using results from the "Speaking-up About Patient Safety Questionnaire".

Results

"Safety Attitudes Questionnaire" scores were significantly higher after programme completion in two of three answered questions (5.0 (4.0, 5.0) versus 4.0 (4.0, 5.0) $p=0.0002$ and 5.0 (4.0, 5.0) versus 4.0 (4.0, 4.0) $p=0.002$, Median (1st quartile, 3rd quartile)) ($n = 34$). Our composite score on the "Speaking-Up About Patient Safety Questionnaire" was significantly higher (5.9 ± 0.7 versus 5.2 ± 1.0, mean ± standard deviation, $p < 0.001$) than the benchmark ($n = 65$).

Conclusion

A long-term multimodal programme for speaking-up was successfully implemented. Attitude and climate towards safety generally improved and post-programme perceived levels of assertive communication and speaking-up were higher than the benchmark. These results support current opinion that multimodal programmes and continued effort are required, but that speaking-up can indeed be strengthened.

Keywords

Speaking-Up, psychological safety, high-fidelity simulation, online learning

Introduction

Speaking-up is a method of assertive communication by which concerns, such as threats to patient safety or the presence of unsafe conditions, are stated with persistence until there is a clear resolution. [1, 2, 3] According to the Joint Commission's sentinel event data from 2015, the failure to speak up was one of the top three root causes for adverse events in the peri-operative period.[4] Withholding voice despite safety concerns is a common behaviour among health care professionals. A Swiss multicentre study reported that 19%–39% of health-care workers had chosen to withhold voice within the past four weeks.[5] Several barriers for speaking-up have been identified in the perioperative setting, including perceived ineffectiveness, presence of patients and authority gradients.[1], [6]

Research on the implementation of speaking-up has mainly focused on single groups, including nursing students,[7] medical students,[8] and residents.[9], [10] In general, implementation of speaking-up has demonstrated varying success,[11], [12] but common themes include: necessity for an implementation programme involving all members of staff, education to support a transformation in organisational culture,[13] and addressing norms and communication behaviours.[14] In short, strengthening a culture of speaking-up is an ongoing challenge[15] but also crucial to increasing patient safety.

In order to establish and strengthen speaking-up in our department, we developed and employed a 22-month multi-step implementation programme. To measure the effect of the programme, we compared perceptions of speaking-up before and after the intervention using elements from the "Safety Attitudes Questionnaire", a validated questionnaire for perceptions of patient safety related attitudes, as our primary outcome. As a further measurement,

and secondary outcome, we compared post-intervention levels of speaking-up and assertive communication with comparable Swiss institutions using the "Speaking-Up About Patient Safety Questionnaire".

Methods:

Study institution and population:

The study was performed in the Cantonal Hospital of Baden, a 382 bed teaching hospital of Zurich University, which annually treats more than 20`000 inpatients and more than 170`000 outpatients. All staff members of the department of anaesthesia, i.e. nurse and physician anaesthetists (both residents and consultants) employed at any time during the 22 months were exposed to the implementation programme. The requirement for approval of our study, as well as for written consent, was waived by the ethical committee "Nordwest-schweiz" as well as by our institutional legal board. Participants gave verbal consent. Material was de-identified before any analysis, and destroyed hereafter in conformance with legal requirements.

A total of 117 staff members participated in the implementation programme at some time during the 22 months, but due to staff fluctuations, availability, and study requirements, the number of available participants varied over time. Details are presented on the timeline of the project in Figure 1.

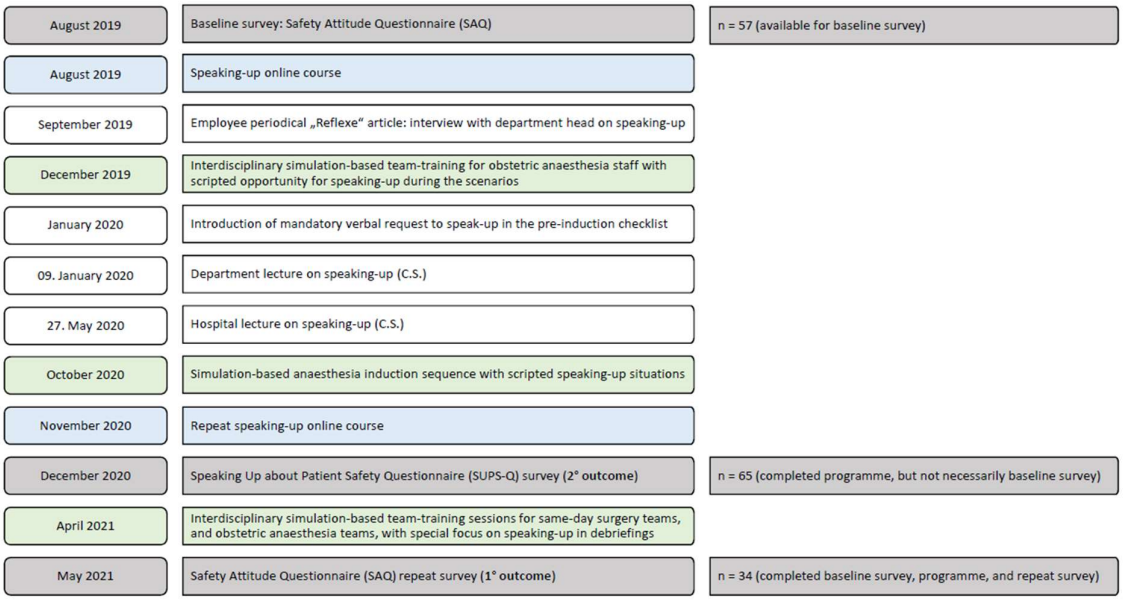

Fig. 1: the implementation programme – of 177 members of staff present at some time during the intervention, 57 participated in the baseline survey, of which 34 completed the repeat survey, providing data for the primary objective. Independent of participation in the baseline survey, 65 members of staff completed the programme and were available for the Speaking-Up About Patient Safety survey, the secondary outcome.

Baseline survey

Prior to implementing the programme, the 57 current members of staff available completed the German language version of the Safety Attitudes Questionnaire. This questionnaire is a validated tool to assess[16], [17] healthcare workers' perceptions of patient safety related attitudes in various clinical areas. Depending on the version, it is comprised of 30 – 60 items measured on a 5-point Likert scale covering six aspects of the safety climate: teamwork climate, job satisfaction, safety climate including perception of speaking-up, stress recognition, working condition and perception of management. The German translation was recently validated[18] and successfully tested in 10 Swiss hospitals[19] and transcribed to the Survey Monkey © online platform for our survey of baseline values.

The Implementation Programme

Following the baseline survey, the multimodal implementation program was initiated in August 2019, and incorporated into the entire anaesthesia department over a course of 22 Months. It consisted of various elements including an awareness campaign, an on-line course, simulation based team trainings, and explicit invitation to speak-up incorporated into daily practice.

To begin the programme, all current staff members were required to participate in the online course developed using the hospital`s native e-learning software, © easylearn schweiz ag, comprised of three components. Firstly, background knowledge and the rationale for speaking-up were presented together with instructions including the two-challenge rule,[20] and providing coaching in advocacy-inquiry with specific examples. The second element was a video featuring the department head as the recipient of speaking-up. Finally, there was a multiple choice exam testing participant's knowledge on rationale and barriers for speaking-up, the effect of the authority gradient, and identification of the correct wording of speaking-up using crisp advocacy-inquiry in various described situations. This exam was graded, and a pass was required. One year later, members of staff were again exposed to the same mandatory online course module as a refresher.

Complementing the teaching, we performed three high-fidelity in-situ simulations with variations of opportunity for speaking-up throughout the implementation programme, to which we assigned as many staff members as rostering allowed during the pandemic:

- interdisciplinary team-training for obstetric anaesthesia staff with scripted opportunity for speaking-up during the scenarios (40 participants from our department) in December 2019

- anaesthesia induction sequence with scripted speaking-up situations with an acting instructor (75 participants) in October 2020,

- interdisciplinary team-training sessions for same-day surgery teams, and obstetric anaesthesia teams, with special focus on speaking-up in debriefings (29 participants from our department) in April 2021

Scenarios and teaching elements were developed and tested prior to study-use by the Author C.S., a trained instructor for medical simulation with experience developing standardised scenarios for measurement and research,[21] then refined by the authors C.S., F.W. and M.H. using a modified Delphi approach, and finally tested by fellow simulation instructors.

Additionally, the programme was accompanied by a continuous awareness campaign including various lectures and workshops reiterating the topics of the online course (background knowledge and the rationale for speaking-up, instructions and suggestions for providing speaking-up, and coaching in advocacy-inquiry with specific examples), and an interview with the head of the department in the hospital newspaper, in which he discussed hierarchy and status issues, introduced the concept of, and called for, speaking-up.

Finally, as of January 2020, we incorporated speaking-up into our daily clinical practice by augmenting the pre-induction checklist and team-briefing with the request to perform speaking-up made by the highest-ranked team member. This action served a dual purpose –

as an ongoing reminder of leadership commitment to speaking-up, and a tool to reduce the barriers of hierarchy by the mechanism of leader inclusiveness – words and deeds by leaders that invite and appreciate others' contributions which can take nature off its course, helping to overcome status' inhibiting effects on psychological safety.[22]

Primary Outcome – Pre-Post comparison using the "Safety Attitudes Questionnaire"

For our primary outcome, we interviewed all current members of staff who completed the whole implementation programme and had participated in the baseline survey (n = 34) using the following three questions from the "Safety Attitudes Questionnaire" used for the base-line survey, which specifically focus on assertive communication and speaking-up, after the implementation period of 22 months and compared scores:

- *In this clinical area, it is difficult to speak up if I perceive a problem with patient care.*
- *In this clinical area, it is difficult to discuss errors.*
- *I am encouraged by my colleagues to report any patient safety concerns I may have.*

Both cohorts contained the same participants and results were compared unpaired.

Secondary Outcome – comparison of results from our institution with the benchmark of comparable Swiss institutions using the "Speaking-Up About Patient Safety Questionnaire".[23]

65 members of staff participating in the implementation programme from the beginning and available at the time of the survey completed the Speaking-Up about Patient Safety Ques-tionnaire, a validated questionnaire developed by the Swiss Patient Safety Foundation focus-

sing on speaking-up and assertive behaviour among healthcare staff. Specifically, the questionnaire assesses the two theoretical constructs of speaking-up and withholding voice, while covering three speaking-up climate related subscales: psychological safety for speaking-up, encouraging environment, and resignation. The Questionnaire has been used in 22 Swiss hospitals, and in 5 comparable departments, which allows valuable cross-hospital comparisons of speaking-up behaviours and climate.

Statistical analysis

Results for the primary and the secondary outcome were examined by inspection of the histograms. Negatively worded items were reversed before statistics were performed. Two-sided p-values < 0.05 were considered statistically significant. All statistical analyses were conducted using R version 4.0.2[24]

To compare the pre- and post-implementation results of the three relevant questions on the Safety Attitudes Questionnaire (1° outcome), a Mann-Whitney U-Test for non-paired samples was performed. Due to the small sample size and lack of normal distribution, we present the median, and 1st and 3rd quartile.

Concerning the secondary outcome, we compared the results of the “Speaking-Up About Patient Safety Questionnaire” to the benchmark values using Welch's t-test for unequal variances; here, we report the mean and SD according to previous analyses.[23]

Results

Primary outcome

Of the 57 members of staff initially completing the pre-implementation Safety Attitudes Questionnaire, 34 (59.6%) completed the whole implementation programme and were also available for the post-implementation survey with the three relevant questions from the questionnaire.

Scores after implementation were significantly higher in 2 of 3 questions surveyed and did not change significantly in the third question (Table 1).

Safety Attitudes Questionnaire (measures on a 6-point scale)	Median (1st quartile, 3rd quartile)		p value [2]
(n=34)	pre-implementation	post-implementation	
In this clinical area, it is difficult to speak up if I perceive a problem with patient care. [1]	4.0 (4.0, 4.75)	5.0 (4.0, 5.0)	0.0002
In this clinical area, it is difficult to discuss errors. [1]	4.0 (4.0, 4.0)	5.0 (4.0, 5.0)	0.0022
I am encouraged by my colleagues to report any patient safety concerns I may have.	4.0 (3.0, 4.0)	4.0 (3.0, 5.0)	0.7220

[1] negatively worded items are reverse coded for the total score.
[2] p-values: Mann-Whitney U-Test for non-paired samples

Table 1: comparison of median (1st Q, 3rd Q) responses to Safety Attitude Questionnaire items pre- and post-implementation.

Secondary outcome

A total of 65 members of staff which had completed the implementation programme also completed the Speaking-Up About Patient Safety Questionnaire. Safety concerns were common among survey participants. The majority reported at least one patient safety concern during the past four weeks (92%). At least one episode of speaking-up during the past four weeks was reported by 94%. At least one episode of "withholding voice" was reported by 58%. The barriers reported by respondents as hindering them to voice their concerns were reaction of the actor not predictable (35%), presence of patients or relatives (34%), ineffectiveness of speaking-up (31%), unclear risk for the patient (29%), difficulty finding the right tone (12%) and fear of negative reactions (8%).

Overall responses to the climate survey items are reported in Table 2. Results obtained in this study were higher when compared to the Swiss perioperative care sample.[6] Respondants in our hospital reported higher levels of psychological safety, a more positive encouraging environment, and described less resignation towards speaking-up.

Items and scales (measure on a 7-point Likert scale)	Mean (SD)		p value [2]
	This sample (n=65)	Swiss perioperative care sample (n=360)	
Psychological Safety for Speaking up, mean scale score	*6.2 (0.6)*	*5.5 (1.1)*	*<0.001*
I can rely on my colleagues (doctors and/or nurses), whenever I encounter difficulties in my work.	6.4 (0.6)	5.6 (1.4)	<0.001
I can rely on the shift supervisor (person in charge of a shift) whenever I encounter difficulties in my work.	6.4 (0.9)	5.6 (1.6)	<0.001
The culture in my unit/clinical area makes it easy to speak up about patient safety concerns.	6.2 (0.9)	5.4 (1.6)	<0.001
My colleagues (doctors and/or nurses) react appropriately, when I speak up about my concerns about patient safety.	5.9 (0.9)	5.4 (1.2)	<0.001
My shift supervisors (person in charge of a shift) react appropriately, when I speak up about my patient safety concerns.	5.9 (1.0)	5.5 (1.4)	0.009
Encouraging Environment for Speaking up, mean scale score	*5.9 (0.9)*	*4.9 (1.4)*	<0.001
In my unit/ clinical area, I observe others speaking up about their patient safety concerns.	5.6 (1.2)	5.2 (1.5)	0.028
I am encouraged by my colleagues (doctors and/or nurses) to speak up about patient safety concerns.	6.0 (1.1)	4.6 (1.7)	<0.001
I am encouraged by my shift supervisor (person in charge during a shift) to speak up about patient safety concerns.	6.1 (1.1)	4.9 (1.8)	<0.001
Resignation towards Speaking up, mean scale score	*2.5 (1.1)*	*3.2 (1.4)*	*<0.001*
When I have patient safety concerns it is difficult to bring them up. [1]	2.0 (1.1)	2.4 (1.6)	0.002
Having to remind staff of the same safety rules again and again is frustrating. [1]	3.1 (1.7)	3.9 (2.1)	<0.001
Sometimes I become discouraged because nothing changes after expressing my patient safety concerns. [1]	2.5 (1.5)	3.1 (1.9)	0.004
Total speak up climate score (mean across items)	5.9 (0.7)	5.2 (1.0)	*<0.001*

[1] negatively worded items are reverse coded for the total score.
[2] p-values: Welch's t-test for unequal variances

Table 2: comparison of mean (SD) responses to climate survey items for our department and the Swiss comparison.

Discussion

Results

We found that the 22 month implementation programme was associated with higher levels of self-reported speaking-up behaviour, as evidenced by a significant improvement in two of three elements on the post-implementation Safety Attitudes Questionnaire items addressing assertive communication and speaking-up, and higher over-all scores in the climate survey as compared to the benchmark of similar healthcare institutions in Switzerland.

Although or study did not investigate the effects of each separate intervention within the programme, evidence does suggest that leader inclusiveness and leadership support is critical – as such, we feel that our head of department providing interviews, lectures, and a scripted video inviting to speaking-up was essential for the programme's success and patient-safety climate in our department.

Although there was an improvement in 2 out of 3 responses on the Safety Attitudes Questionnaire, the survey question "I am encouraged by my colleagues to report any patient safety concerns I may have" did not show any improvement post implementation. We believe this might be because of the relatively high baseline value (4.0 on a 5-point scale), and the fact that our implementation programme did not explicitly focus on peer support as much as the more prominent issues of hierarchy, leadership and empowerment. Also, the request to perform speaking-up expressed by the highest ranked team member at every induction might have made encouragement by other team members seem less important. However, this evidence seems to show that strengthening of peer support to do the right thing might indeed need more focus in consecutive programmes.

Although the higher over-all scores in the Speaking-up About Patient Safety Questionnaire as compared to the benchmark of similar healthcare institutions in Switzerland suggest a positive effect of our implementation programme, some results are sobering, albeit not unexpected. Although most respondents reported at least one patient safety concern during the past four weeks, over half reported withholding voice within the same period - this is a stark reminder of the fact that even an intervention of our dimension is only one step on the road to patient safety. Reported barriers (unpredictable reaction of recipient of speaking-up,

presence of patients or relatives, assumed or experienced ineffectiveness of speaking-up, an unclear risk for the patient, difficulty finding the right tone and fear of negative reactions) persist, and provide a road map for further interventions. As we only implemented our programme in the department of anaesthesia, we must consider one barrier, the assumed or experienced ineffectiveness, in context of interdisciplinary communication in particular: if the culture of patient safety and leadership support for speaking-up is less well established in a department closely interconnected such as surgery, there is a limit to the benefit for patient safety which can be achieved by improvements in one department only.

Strengths of our study:

To our knowledge, our study is one of the first to detail a longitudinal and multifaceted implementation programme involving all levels of staff and leadership, addressing speaking-up and voice behaviour, and providing objective measures of its success. A further advantage is our comparison of scores to a national benchmark.

Limitations of our study:

Our study is limited by its small size and relatively small response rate. Due to the requirement that study participants completed the whole implementation programme and staff fluctuation over the 22 months, overall numbers were smaller than expected. Additionally, the prominence of leadership support in “safe behaviour” makes a Hawthorne effect highly likely.

Furthermore, at the time of the study we did not have a structured reporting instrument for near misses and adverse events in place apart from the critical incident reporting system,

which due to legal restrictions in Switzerland cannot be considered a representative database. Improvements in reporting are a logical next step for the implementation programme.

Another possible limitation is that this study was a single centre study in one department and cultural region; it is unclear in how far results are reproducible in another department, institution, or even country with different norms and cultures. Indeed, a department of anaesthesia with a traditionally shallow hierarchy in Switzerland (being a country with low power distance index but relatively high scores on indices for individualism, masculinity, and uncertainty-avoidance according to Hofstedes cultural dimensions) probably requires emphasis on different elements of a multimodal approach as would a different department or population in another cultural setting. Due to this limitation, we feel that a rigorous investigation into perceived barriers before implementing such a program – as we performed using the Safety Attitudes Questionnaire – can provide valuable guidance to address these differences.

Conclusion

A long term, inclusive and multi-step programme for establishing speaking-up was successfully implemented at our institution. Attitude and climate towards safety in our department improved after implementation according to “SAQ”-scores; the “Speaking-Up About Patient Safety Questionnaire” respondents at our institution reported higher levels of psychological safety, a more positive encouraging environment, and described less resignation towards speaking-up, as in comparable Swiss institutions. These results seem to support current opinion that, although a multimodal programme and continued effort are required to assist

285 the change in culture and behaviour towards safer healthcare, increases in levels of speak-

286 ing-up can indeed be achieved.

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Conflicts of interests

All the authors report no conflicts of interest.

Authors contributions

FW: Designed the study, performed the analyses, interpreted the data, drafted the manuscript.

CS: Designed the study, performed the analyses, interpreted the data, drafted the manuscript.

DS: Designed the study, performed the analyses, interpreted the data, drafted the manuscript.

EK: Performed the analyses, interpreted the data.

SOZ: Designed the study, drafted the manuscript.

DK: Designed the study, interpreted the data, drafted the manuscript.

MH: Designed the study, performed the analyses, interpreted the data, drafted the manuscript.

Bibliography

1. Etchegaray JM, Ottosen MJ, Dancsak T, Thomas EJ. Barriers to Speaking up about Patient Safety Concerns. *J Patient Saf* 2020;

2. Leonard M, Graham S, Bonacum D. The human factor: The critical importance of effective teamwork and communication in providing safe care. *Qual Saf Heal Care* 2004; **13**: 85–90

3. Lyndon A, Sexton JB, Simpson KR, Rosenstein A, Lee KA, Wachter RM. Predictors of likelihood of speaking up about safety concerns in labour and delivery. *BMJ Qual Saf* 2012; **21**: 791–9

4. Joint Commission Online. Sentinel event statistics [Internet]. Sentin. event Stat. 2014. April 29, 2015. 2014 [cited 2018 Jul 25]. p. https://www.jointcommission.org/assets/1//23/jconl Available from: https://www.jointcommission.org/assets/1/23/jconline_April_29_15.pdf

5. Schwappach D, Richard A. Speak up-related climate and its association with healthcare workers' speaking up and withholding voice behaviours: A cross-sectional survey in Switzerland. *BMJ Qual Saf* 2018; **27**: 836–43

6. Schwappach D, Sendlhofer G. Speaking Up about Patient Safety in Perioperative Care: Differences between Academic and Nonacademic Hospitals in Austria and Switzerland. *J Investig Surg* [Internet] Taylor & Francis; 2020; **33**: 730–8 Available from: https://doi.org/10.1080/08941939.2018.1554016

7. Hanson J, Walsh S, Mason M, Wadsworth D, Framp A, Watson K. 'Speaking up for safety': A graded assertiveness intervention for first year nursing students in preparation for clinical placement: Thematic analysis. *Nurse Educ Today* 2020;

8. Schwappach D, Sendlhofer G, Kamolz LP, Köle W, Brunner G. Speaking up culture of medical students within an academic teaching hospital: Need of faculty working in patient safety. *PLoS One* 2019; **14**: 1–13

9. Voogt JJ, Taris TW, van Rensen ELJ, Schneider MME, Noordegraaf M, van der Schaaf MF. Speaking up, support, control and work engagement of medical residents. A structural equation modelling analysis. *Med Educ* 2019; **53**: 1111–20

10. Daly Guris RJ, Duarte SS, Miller CR, Schiavi A, Toy S. Training novice anaesthesiology trainees to speak up for patient safety. *Br J Anaesth* [Internet] Elsevier Ltd; 2019; **122**: 767–75 Available from: https://doi.org/10.1016/j.bja.2019.01.017

11. White MC, Peterschmidt J, Callahan J, Fitzgerald JE, Close KL. Interval follow up of a 4-day pilot program to implement the WHO surgical safety checklist at a Congolese hospital. *Global Health* Globalization and Health; 2017; **13**: 1–9

12. Hemingway MW, O'Malley C, Silvestri S. Safety Culture and Care: A Program to Prevent Surgical Errors. *AORN J* 2015; **101**: 404–15

13. Pattni N, Arzola C, Malavade A, Varmani S, Krimus L, Friedman Z. Challenging authority and speaking up in the operating room environment: a narrative synthesis. *Br J Anaesth* [Internet] Elsevier Ltd; 2019; **122**: 233–44 Available from:

https://doi.org/10.1016/j.bja.2018.10.056

14. Jones A, Blake J, Adams M, Kelly D, Mannion R, Maben J. Interventions promoting employee “speaking-up” within healthcare workplaces: A systematic narrative review of the international literature. *Health Policy (New York)* [Internet] Elsevier Ireland Ltd; 2021; Available from: https://doi.org/10.1016/j.healthpol.2020.12.016

15. Brennan PA, Davidson M. Improving patient safety: We need to reduce hierarchy and empower junior doctors to speak up. BMJ. 2019.

16. Flin R, Burns C, Mearns K, Yule S, Robertson EM. Measuring safety climate in health care. Qual. Saf. Heal. Care. 2006.

17. Sexton JB, Helmreich RL, Neilands TB, et al. The Safety Attitudes Questionnaire: Psychometric properties, benchmarking data, and emerging research. *BMC Health Serv Res* 2006;

18. Zimmermann N, Küng K, Sereika SM, Engberg S, Sexton B, Schwendimann R. Assessing the safety attitudes questionnaire (SAQ), German language version in Swiss university hospitals - A validation study. *BMC Health Serv Res* 2013;

19. Gehring K, Mascherek AC, Bezzola P, Schwappach DLB. Safety climate in Swiss hospital units: Swiss version of the Safety Climate Survey. J. Eval. Clin. Pract. 2015.

20. Pian-Smith MCM, Simon R, Minehart RD, et al. Teaching residents the two-challenge rule: A simulation-based approach to improve education and patient safety. *Simul Healthc* 2009; **4**: 84–91

21. Schick CJ, Weiss M, Kolbe M, et al. Simulation with PARTS (Phase-augmented research and training scenarios): A structure facilitating research and assessment in simulation. *Simul Healthc* 2015; **10**: 178–87

22. Nembhard IM, Edmondson AC. Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *J Organ Behav* 2006;

23. Richard A, Pfeiffer Y, Schwappach DDL. Development and Psychometric Evaluation of the Speaking Up About Patient Safety Questionnaire. *J Patient Saf* 2017; **Publish Ah**: 1–8

24. R Development Core Team (2008). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna Austria.

Legend

Fig. 1: the implementation programme – of 177 members of staff present at some time during the intervention, 57 participated in the baseline survey, of which 34 completed the repeat survey, providing data for the primary objective. Independent of participation in the baseline survey, 65 members of staff completed the programme and were available for the Speaking Up About Patient Safety survey, the secondary outcome.

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