



Effect of Virtual Collaborative Learning with Mobile Devices on Patient Safety Culture among the Staff of a Maternity Center

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Abstract

Background: Improving patient safety is a common international priority because errors and other forms of unnecessary damage to the process of patient care and treatment are global problems. Training programs such as web-based programs enhance the patient safety culture in staff. This study was carried out to evaluate the impact of virtual collaborative learning with mobile devices on patient safety culture among the staff of a maternity center.

Methods: This study was conducted on staff working in Kowsar Hospital of Qazvin in 2019 with a pretest-posttest design. Sixty-three eligible participants were recruited using convenience sampling. The educational contents were shared on a website. Data were collected online using the hospital Survey on Patient Safety Culture questionnaire. Educational intervention sessions were held once a week, for 8 weeks. The paired t-test and chi-square test were used for statistical analysis. The significance level was set at 0.05.

Results: The mean score of safety culture increased significantly from 141.19±16 to 147.93±14.05 after the intervention (P<0.001). Error reporting at the center also increased significantly after the intervention (P<0.001).

Conclusion: This research showed that the collaborative method using mobile learning can be effective for the promotion of patient safety culture among the maternity center staff.

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Highlights:

What is current knowledge?

Surveys in some regions of Iran and other countries indicate that the patient safety culture is currently low and moderate, and efforts should be made to promote it. Patient safety culture training programs are useful for improving patient safety quality.

What is new here?

Collaborative learning is a non-traditional and innovative method that enhances mental processes by strengthening human characteristics. One of the strategies that has been most reinforced or that has accompanied the approaches to collaborative learning is what is known as mobile

Introduction

Improving patient safety is a common international priority because errors and other forms of unnecessary damage to the process of patient care and treatment are global problems. Patient safety includes all measures that are planned and implemented to prevent damage to patients due to medical care (1).

Nearly 10% of hospital admissions lead to adverse events, and about half of them are preventable. About 1 out of every 3 adverse events causes actual damage to patients (3, 2). In a systematic review study in Iran, nearly 1,455 complaints (36%) of the total number of 3,977 complaints were proved to be medical malpractice, and physicians were acquitted in 2,542 (64%) cases. Most complaints were related to gynecologists, accounting for 43% of all complaints (4).

Obstetrics is the leading cause of admissions, triage, and hospital discharge. Appropriately, safety initiatives and the use of quality measures particularly relevant to obstetrics and gynecology are essential for patient satisfaction as well as safe and efficient evidence-based care (5). Three reasons for patient safety in obstetrics; 1. Obstetric admissions are considered a huge part of all patients' hospitalization. 2. The obstetric setting is unique with high families' and patients' expectations and failure to meet these expectations would be a disappointment for healthcare providers. 3. The high economic and emotional cost of the adverse outcomes that occur in obstetric settings (6).

A maternity center is a specialized hospital that provides healthcare for women during pregnancy, delivery, and postpartum periods (7). The existence of a patient

safety culture among the staff of an organization significantly affects patient safety. Patient safety culture was introduced by the European Foundation for Quality Management in medical care. It is an integrated model of individual and organizational behavior based on shared beliefs and values that consistently seek to minimize damage to patients (8).

Patient safety culture has been considered an important factor in improving the quality of patient health and safety services (9). Surveys in some regions of Iran and other countries indicate that the culture of safety is currently low and moderate, and efforts should be made to promote it (2, 10, 11). The creation of a safety culture takes a long time and does not happen automatically (12). Patient safety culture training programs are useful for improving patient safety quality (13). There are still few safety culture training programs for midwifery training institutions (14). For improving safety, health systems should have easy access to information (15). A kind of classification divides training into two classes, classical and web-based. Web-based training is a new and active training method to improve the training quality, especially if it is applied as a complement to traditional training to establish the continuity of traditional training. Its benefits include easy access at any time and place, learners' limitless, great participation, and flexibility (16). The presence of educational proposals that are more distant from traditional approaches is an increasingly clear trend (17). One of the educational practices that have been gaining the most recognition in recent times is what is known as collaborative learning (18). The approach is based on the work of two or more people (19). The elements that make up this methodology are diverse. The didactic elements acquire a greater dimension, since they do not correspond to an individual mechanical task, but have to be one of the bases of the symbiosis between the members of the group (20). This pedagogical practice, whose presence in higher education has increased significantly, reinforces human characteristics, to benefits in the state of mind during the process (21). One of the strategies that has been most reinforced or that has accompanied the approaches to collaborative learning is what is known as mobile learning. Information and communication technologies are means associated with new pedagogical approaches, which is classified as an educational innovation. In this case, mobile learning and collaborative learning are closely linked. In recent years, the so-called Mobile Computer-Supported Collaborative Learning has emerged (22). Mobile learning is one of the major evidences that expose the union of information and communication technologies and education. Its conception is based on technological devices whose presence in daily life is already natural,

and promotes the emergence of a great literary interest in its didactic applications (23).

Given the importance of maternal health according to the Millennium Development Goals, it is essential to address safety and create or maintain a maternal safety culture among maternity center staff. Educational intervention could be an effective strategy to create a patient safety culture. This study was carried out to evaluate the impact of virtual collaborative learning with mobile devices on patient safety culture among the staff in the maternity center.

Methods

This study was conducted on staff working in Kowsar Hospital of Qazvin in 2019 with a pretest-posttest design. Sixty-three eligible participants were recruited using convenience sampling. Inclusion criteria included willingness to participate in the study, employment in a maternity center, access to the internet, ability to use the internet, having an email address or an account in WhatsApp to share learning, and at least a year of work experience as a nurse or midwife. Exclusion criteria were previous participation in similar training sessions and staff transfer.

According to Pakzad et al. (11), at the level of type I error $\alpha=0.05$, type II error $\beta=0.1$, and error $d=1.1$, the sample size was calculated as 50. Considering 30% dropout, the sample size was calculated 65.

The Hospital Survey on Patient Safety Culture (HSOPSC) was used to estimate the status quo. The HSOPSC was designed by the Agency for Healthcare Research and Quality in 2004 (24) and was translated into Persian by Rahimi et al. (2020) (25). Internal consistency and reliability were evaluated by Cronbach's alpha. The tool consists of 42 items that measure 12 dimensions of patient safety culture. The dimensions of the HSOPSC are as follows: 1) communication openness, 2) feedback and communication about errors, 3) teamwork within units, 4) non-punitive response to error, 5) organizational learning–continuous improvement, 6) supervisor/manager expectations and actions promoting patient safety, 7) staffing, 8) handoffs and transitions, 9) management support for patient safety, 10) frequency of events reported, 11) overall perceptions of patient safety, and 12) teamwork across hospital units (26). The respondents' views using the 5-point Likert scale of agreement from 1 to 5 ("strongly disagree" to "strongly agree") or frequency ranged from 1 to 5 ("never" to "always"). The Cronbach's alpha coefficient was between 0.57 and 0.8. In the present study, the internal reliability ranged from 0.78 to 0.87.

For educational intervention, the contents of the patient safety booklet available in hospitals (written by the Office of Hospital Management and Clinical Services Excellence of the Ministry of Health) and the book entitled Understanding and managing patient safety risk were used (27). This textbook was approved by five experts in midwifery.

A website with the following details was created for teaching. A domain was purchased with the address pcealborz.ir hosted by Mihan Web Host, the provider of Data Gostar Alborz Service, with the following specifications: 300 MB of space and 20 GB of bandwidth; Linux operating system with Iran hosting location; and 4,096 MB of RAM for visiting and content volume. The Persian web-based WordPress Software ver. 4.9.8 was installed on the main domain and then run. Among default themes, the Hueman theme was selected and installed. The next step was to install the necessary plugins on the counter. Participants registered on the website and completed informed consent and the HSOPSC survey. Participants created an account on WhatsApp. Next, training sessions were held online, a session per week for 8 weeks. A week after the final training session, the educational text was no longer available to participants and those participants completed the questionnaire 2 months later.

At the same time, new content was uploaded to the website, a WhatsApp message was sent to the members. This message contained only the session number and the session link. No content was uploaded on the WhatsApp channel. By clicking on the link, the members could directly link to the relevant training session and read it. The second reminder message was also sent at the end of the week for those who have not yet read the present week's training material. Those members who had read the sessions had to log in on the website at the end of each session, enter their email addresses, and click on the button "I've read" at the bottom of the page. A message confirming the attendance of the participants was then sent to the site management. One month later, participants entered the WhatsApp channel and shared/discussed what they had learned on the website (Table 1).

Data were analyzed using SPSS software (version 16) and R (version 4.0.4). Descriptive statistics including mean, standard deviation, median, interquartile range (IQR), frequency, and percentage were used to describe the collected data. According to the type and distribution of variables, paired t-test or Wilcoxon signed-rank test was applied to compare the pre and posttest data. The significance level of the tests was set to less than 0.05.

Results

The mean age of maternity ward staff was 31.9 ± 6.4 years. The mean employment history was 6.8 ± 5.2 years. The mean employment duration in the current ward was 2.5 ± 1.56 years.

At first, the normality of the scores obtained from the studied units was confirmed using the Kolmogorov-Smirnov and Shapiro tests ($P>0.05$). Of 65 participants,

63 (88%) completed the study. Of all participants, 21 (33.3%) were working in the emergency ward, 18 (28.7%) in the delivery ward, 12 (19%) in the prenatal ward, and 12 (19%) in the postpartum ward.

The results showed that the mean scores of safety culture increased significantly after the intervention ($t= -4.46$, $df=62$, $P<0.001$). Moreover, there were significant differences between mean scores of reporting frequency, organizational learning, intra-organizational teamwork, non-punitive response to errors, teamwork between organizational units, and information exchange and transfer ($P<0.05$). However, the differences in mean scores of general understanding of patient safety, inferential channel openness, communication, feedback on errors, staff issues, and patient safety management support were not statistically significant ($P>0.05$) (Table 2).

The intervention significantly increased the error reporting at the center (median of error reporting at pretest = 1, IQR: [1, 2] and at posttest = 2, IQR: [2, 3], $P<0.001$) (Figure 1).

Discussion

Results of the present study indicated that collaborative learning with mobile devices could improve patient safety culture in maternity center staff. In particular, mean scores of reporting frequency, organizational learning, intra-organizational teamwork, non-punitive response to errors, teamwork between organizational units, and information exchange and transfer changed significantly following the intervention. Costa et al. (2020) concluded that the collaborative learning method associated with mobile learning is more effective for learning didactic programming than the traditional method (28). Some good practices that educational institutions have started to promote are based on the creation of useful methodological principles that converge in a quality, current, and innovative education (29, 30). Pakzad et al. (2016) reported that virtual education could significantly improve the patient safety culture of nurses in educational and medical centers (11). Although the mentioned study and the present study differed in the methods used, both virtual methods could improve the patient safety culture.

In a multicenter interventional study, the improvement of patient safety scores was closely associated with the personnel's behavior. The study concluded that a healthy immune culture could improve patient safety (31).

Mostafaei et al. (2018) stated that improving patient safety should be a major priority for hospital managers and the staff should be encouraged to report errors without fear of punishment and blame. The institutionalization of this issue requires the strong support of senior managers in organizations. The results indicated that teamwork within hospital units (62%) and frequency of adverse event reporting (62%) had the highest scores among safety culture dimensions, while the overall understanding of patient safety (56%) and non-punitive response to errors (58%) received the lowest scores among different aspects of patient safety culture (32). These results are consistent with the present study in terms of error reporting and teamwork but inconsistent in other dimensions.

In a study by Akbari et al. (2017), it was also concluded that labor block personnel were the strongest in teamwork and weakest in error reporting. It was also stated that despite implementing the safety culture protocol in the labor block, there is still a great distance to reach a high level of patient safety. They also recommended that non-midwives working in the labor block should be more involved in this issue, but non-midwives were reluctant to participate in the study in the present research (33).

In our study, only one maternity center was investigated, which is a limitation of the present study. Also, due to the participatory nature of the intervention, we did not have a suitable control group. It is suggested to compare this method with another learning method and a control group in future studies.

Conclusion

Comprehensive programs for patient safety culture improvement can affect the maternity center staff behavior and lead to the promotion of patient safety levels to the highest standard. Given the availability of mobile phones and the Internet, it is suggested to utilize this method in comprehensive programs for patient safety culture improvement. This teaching method could be applied in confinement, allowing the staff to adequately follow the teaching-learning process by utilizing available resources.

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Ethical statement

The present study was conducted after receiving approval from the Ethics Committee of Qazvin University of Medical Sciences (code: IR.QUMS.REC.1396.496). Informed consent was also from participants after ensuring the confidentiality of their information.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Author contributions

Conceptualization: Forouzan olfati, Soheila Nooriani, Sonia Oveisi. Methodology, analysis, research a review: Forouzan olfati, Ahad Alizadeh, Sonia Oveisi.

Writing- review and editing: Forouzan olfati, Soheila Nooriani, Sonia Oveisi. Supervision: Forouzan olfati.

References

- López-Liria R, Rocamora-Pérez P, Aguilar-Parra JM, Vargas-Muñoz ME, del Pilar Díaz-López M, Padilla-Góngora D. Evaluation in Primary Care Professionals: The Patient's Safety Culture. *Procedia-Social and Behavioral Sciences*. 2017; 237:1272-6. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Phaghizadeh S, Asoori M. Assessment of Nurses Viewpoints on Patient Safety Culture in Amol Hospitals in Iran, 2012. *Preventive Care in Nursing & Midwifery Journal*. 2015; 4(2):45-55. [[View at paplisher](#)] [[Google Scholar](#)]
- Schwendimann R, Blatter C, Dhaini S, Simon M, Ausserhofer D. The occurrence, types, consequences and preventability of in-hospital adverse events- a scoping review. *BMC health services research*. 2018;18(1):1-13. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Raeissi P. Medical malpractice in Iran: A systematic review. *Medical journal of the Islamic Republic of Iran*. 2019; 33:110. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Brown HL. Quality and safety in obstetrics and gynecology. *Clinical obstetrics and gynecology*. 2017; 60(4):818-28. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Pettker CM, Grobman WA. Obstetric safety and quality. *Obstetrics & Gynecology*. 2015; 126(1):196-206. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Lindsay P, Sandall J, Humphrey C. The social dimensions of safety incident reporting in maternity care: the influence of working relationships and group processes. *Social Science & Medicine*. 2012; 75(10):1793-9. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Stoyanova R, Dimova R, Tornyova B, Mavrov M, Elkova H. Perception of Patient Safety Culture among Hospital Staff. *Slovenian Journal of Public Health*. 2021; 60(2):97. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Alqattan H, Cleland J, Morrison Z. An evaluation of patient safety culture in a secondary care setting in Kuwait. *Journal of Taibah University Medical Sciences*. 2018;13(3):272-80. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Wang X, Liu K, You L-m, Xiang J-g, Hu H-g, Zhang L-f, et al. The relationship between patient safety culture and adverse events: a questionnaire survey. *International journal of nursing studies*. 2014; 51(8):1114-22. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Pakzad N, Norouzi TK, Fallahi KM, Norouzi M. A comparison of the effect of virtual and lecture- based patient safety education on safety culture among Nurse. *Qom University of medical science journal*. 2016; 10(9):27-34. [[View at paplisher](#)] [[Google Scholar](#)]
- Hanif F, Read JC, Goodacre JA, Chaudhry A, Gibbs P. The role of quality tools in assessing reliability of the internet for health information. *Informatics for Health and Social Care*. 2009; 34(4):231-43. 13. Xie J-f, Ding S-q, Zhong Z-q, Zeng S-n, Qin C-x, Yi Q-f, et al. A safety culture training program enhanced the perceptions of patient safety culture of nurse managers. *Nurse education in practice*. 2017; 27:128-33. <https://doi.org/10.1016/j.nepr.2017.08.003> [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Marsch LA, Guarino H, Grabinski MJ, Syckes C, Dillingham ET, Xie H, et al. Comparative effectiveness of web-based vs. educator-delivered HIV prevention for adolescent substance users: a randomized, controlled trial. *Journal of substance abuse treatment*. 2015; 59:30-7. 15. Morey SA, Stuck RE, Chong AW, Barg-Walkow LH, Mitzner TL, Rogers WA. Mobile health apps: Improving usability for older adult users. *Ergonomics in Design*. 2019; 27(4):4-13. <https://doi.org/10.1177/1064804619840731> [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Quinn GP, Bowman Curci M, Reich RR, Gwede CK, Meade CD, and Group EEW, et al. Impact of a web-based reproductive health training program: ENRICH (Educating Nurses about Reproductive Issues in Cancer Healthcare). *Psycho-oncology*. 2019; 28(5):1096-101. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Kars-Unluoglu S. How do we educate future innovation managers? Insights on innovation education in MBA syllabi. *Innovation*. 2016; 18(1):74-98. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Hofmann R, Mercer N. Teacher interventions in small group work in secondary mathematics and science lessons. *Language and education*. 2016; 30(5):400-16. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Keshani P, Hossein Kaveh M, Faghieh S, Salehi M. Improving diet quality among adolescents, using health belief model in a collaborative learning context: A randomized field trial study. *Health education research*. 2019; 34(3):279-88. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Hautala J, Schmidt S. Learning across distances: An international collaborative learning project between Berlin and Turku. *Journal of Geography in Higher Education*. 2019; 43(2):181-200. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Isohäätä J, Näykki P, Järvelä S. Cognitive and socio-emotional interaction in collaborative learning: Exploring fluctuations in students' participation. *Scandinavian Journal of Educational Research*. 2020;64(6):831-51. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Sung Y-T, Yang J-M, and Lee H-Y. The effects of mobile-computer-supported collaborative learning: Meta-analysis and critical synthesis. *Review of educational research*. 2017; 87(4):768-805. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Bond M, Buntins K, Bedenlier S, Zawacki-Richter O, Kerres M. Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of Educational Technology in Higher Education*. 2020; 17(1):2. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Smits M, Christiaans-Dingelhoff I, Wagner C, van der Wal G, Groenewegen PP. The psychometric properties of the Hospital Survey on Patient Safety Culture in Dutch hospitals. *BMC health services research*. 2008; 8(1):230. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Rahimi E, Alizadeh SS, Safaeian AR, Abbasgholizadeh N. Dimensions analysis of the Hospital Survey on Patient Safety Culture questionnaire in Iran: Psychometric properties. *The International Journal of Health Planning and Management*. 2020;35(6):1532-45. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Reis CT, Paiva SG, Sousa P. The patient safety culture: a systematic review by characteristics of hospital survey on patient safety culture dimensions. *International Journal for Quality in Health Care*. 2018;30(9):660-77. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Mohammad fam Iraj DA, Zareei Esmaeil at al. Understanding and Risk management of patient safety. 1, editor. Tehran: Fadakstatis; 2016. [[View at paplisher](#)] [[Google Scholar](#)]
- Costa RS, Medrano MM, Ostariz PL, Moreno-Guerrero A-J. How to teach pre-service teachers to make a didactic program? The collaborative learning associated with mobile devices. *Sustainability*. 2020; 12(9):3755. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Beekman M, Emani VK, Wolford R, Hanson K, Wickham G, Aiyer M. Patient safety morning report: Innovation in teaching core patient safety principles to third-year medical students. *Journal of medical education and curricular development*. 2019; 6:2382120519842539. [[DOI](#)] [[Google Scholar](#)]
- Farnan JM, Gaffney S, Poston JT, Slawinski K, Cappaert M, Kamin B, et al. Patient safety room of horrors: a novel method to assess medical students and entering residents' ability to identify hazards of hospitalisation. *BMJ quality & safety*. 2016; 25(3):153-8. 31. Pettker CM, Thung SF, Raab CA, Donohue KP, Copel JA, Lockwood CJ, et al. A comprehensive obstetrics patient safety program improves safety climate and culture. *American journal of obstetrics and gynecology*. 2011; 204(3):216. e1-. e6. <https://doi.org/10.1016/j.ajog.2010.11.004> [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Mostafaei D, Aryankhesal A, Dastoorpoor M, Rahimkhalifeh Z, Estebarsari F. Patient Safety Culture Assessment of Clinical and Paraclinical Staff Perspective in Selected University of Medical Sciences Hospitals in Tehran. *Iranian Journal of Health Education and Health Promotion*. 2018; 6(3):293-301. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Akbari N, Malek M, Ebrahimi P, Haghani H, Aazami S. Safety culture in the maternity unit of hospitals in Ilam province, Iran: a census survey using HSOPSC tool. *The Pan African medical journal*. 2017; 27. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Pettker CM, Thung SF, Raab CA, Donohue KP, Copel JA, Lockwood CJ, et al. A comprehensive obstetrics patient safety program improves safety climate and culture. *American journal of obstetrics and gynecology*. 2011;204(3):216. e1-e6. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Mostafaei D, Aryankhesal A, Dastoorpoor M, Rahimkhalifeh Z, Estebarsari F. Patient Safety Culture Assessment of Clinical and Paraclinical Staff Perspective in Selected University of Medical Sciences Hospitals in Tehran. *Iranian Journal of Health Education and Health Promotion*. 2018;6(3):293-301. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]
- Akbari N, Malek M, Ebrahimi P, Haghani H, Aazami S. Safety culture in the maternity unit of hospitals in Ilam province, Iran: a census survey using HSOPSC tool. *The Pan African medical journal*. 2017;27. [[View at paplisher](#)] [[DOI](#)] [[Google Scholar](#)]

Table 1. The outline of the material presented in the patient safety culture training sessions

Sessions	contents
1	An introduction to patient safety, medical errors, and fundamental principles of patient safety
2	Standards of patient safety friendly hospitals program
3	20 essential standards for patient safety program
4	Patient safety indicators
5	7 steps to patient safety
6	9 solutions for patient safety
7	Patient safety and risk management
8	5 key issues of patient safety and the WHO tools for patient safety

Table 2. Comparison of patient safety culture and its dimensions from the viewpoint of maternity center staff, before and after the intervention

Items	Score		Change score (95% CI)	P-value
	Before intervention	After intervention		
Total number of patient safety culture	141.19±16	147.93±14.05	-6.75 (-9.77, -3.72)	<0.001
Frequency of event reporting	9.63±2.18	10.84±1.55	-1.21 (-1.74, -0.67)	<0.001
Overall perceptions of patient safety	13.76±2.12	13.82±1.7	-0.06 (-0.56, 0.43)	0.799
Supervisor/manager expectations and actions promoting patient safety	13.96±2.38	14.46±2.26	-0.49 (-0.92, -0.06)	0.025
Organizational learning	10.76±1.99	11.38±1.37	-0.62 (-1.04, -0.2)	0.005
Teamwork within organizational units	15.22±2.4	15.7±2.06	-0.52 (-0.93, -0.12)	0.012
Communication openness	9.46±2.02	9.73±1.7	-0.27 (-0.8, 0.26)	0.314
Feedback and communication about error	11.58±1.72	11.88±1.09	-0.3 (-0.71, 0.1)	0.140
Non-punitive response to error	6.38±2.14	6.95±1.77	-0.57 (-0.99, -0.15)	0.009
Staffing	11.65±3.2	11.8±2.9	-0.16 (-0.85, 0.53)	0.649
Hospital management support for patient safety	10.82±2.05	11.2±1.64	-0.38 (-0.78, 0.02)	0.060
Teamwork across the organizational units	13.39±2.53	14.6±2.29	-1.22 (-1.73, -0.72)	<0.001
Hospital handoffs and transitions	14.53±2.28	15.47±1.65	-0.94 (-1.39, -0.48)	<0.001

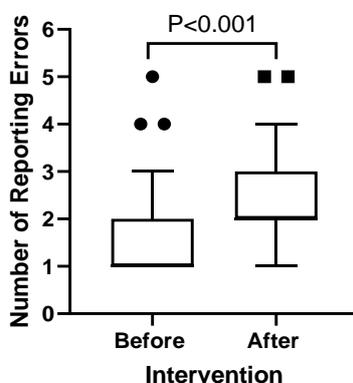


Figure 1. Comparison of research units in terms of the number of reporting errors by maternity center staff, before and after the intervention

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