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Original Research Article

Perceived changes in knowledge and confidence of doctors and midwives after the completion of the Standardized Trainings in Obstetrical Emergencies

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ABSTRACT

Background and objectives: There are only few training programs in obstetric emergencies currently in use and only some of them were evaluated with an adequate sample of participants. Therefore, we present the evaluation of the novel Standardized Trainings in Obstetrical Emergencies (STObE), conducted in Lithuania. The aim of this study was to analyze whether participants' self-reported knowledge and confidence increased after the trainings, and whether the impact of the trainings was long-lasting.

Materials and methods: Data was collected across the majority of hospitals providing secondary and tertiary obstetrical care in Lithuania in 2015. A total of 650 obstetricians-gynecologists and midwives attended the trainings; 388 (response rate 59.7%) of them filled in the initial questionnaire before the trainings, 252 (64.9%) immediately after, 160 (41.2%) 6 weeks after, and 160 (41.2%) 6 months after the trainings, which was the final sample for the analyses. Participants used a Likert-type scale to evaluate their knowledge and confidence about management of urgent obstetrical situations: vacuum-assisted vaginal delivery, shoulder dystocia, postpartum hemorrhage, preeclampsia/eclampsia, early preterm labor, and dystocia. We assessed how participants' self-reported knowledge and confidence changed after the trainings (compared to before the trainings) and how long the effect was retained for.

Results: The mean score of self-reported knowledge in obstetrical emergencies increased immediately after the trainings comparing to the scores before the trainings ($P < 0.001$) and it did not differ further between the three time points after the trainings (i.e. immediately, 6 weeks, and 6 months; $P > 0.05$). The same pattern was observed for self-reported confidence

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scores. The increase in self-reported knowledge and confidence after the trainings was stable. Moreover, the self-reported knowledge and confidence gains were greater for those participants with lower work experience, although benefit was seen across all experience levels.

Conclusions: STroBE improved participants' self-reported knowledge and confidence and lasting positive effects were observed for at least 6 months after the initial trainings. Moreover, the trainings were more beneficial for those with lower work experience, although they benefited all the participants.

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1. Introduction

Obstetrical emergencies, such as early preterm labor (neonates born under 32 weeks of gestation) [1], preeclampsia and eclampsia [2], postpartum hemorrhage [3], shoulder dystocia [4], and vacuum assisted vaginal delivery [5] are sudden and life-threatening medical conditions for both the mother and the neonate. Therefore, obstetricians must be prepared to recognize them immediately and proceed through an orderly sequence of steps in order to achieve good mother and neonate outcomes.

Whether outcomes of these life-threatening situations will be favorable or not depends on their management. Thus, all maternity care providers should regularly update their knowledge, skills, communication, and teamwork competence on the obstetric emergency situations to provide the best quality management of a patient. Strategies to reduce adverse outcomes of emergency situations in obstetrics have focused on infrastructural changes (development of protocols, guidelines and checklists) [6–12], regular team briefings [6,7], and the use of simulations and clinical drills [6–11].

A systematic review of worldwide literature on training in obstetric emergencies found few training programs and fewer that were evaluated with adequate sample size [13]. Most authors used the four levels Kirkpatrick's theoretical model to evaluate whether a training method is effective [14]. The four levels include the following: 1, reaction (to measure participants' satisfaction); 2, learning (to measure improvements of trainees' knowledge and confidence); 3, behavior (to measure implementation of learned skills and behavior into clinical practice); and 4, results (to measure the impact of trainings on the organization and patient outcome). Several studies showed a positive impact on patients or organization after the trainings in obstetric emergencies in the United Kingdom and Denmark [9,10], or improvement of knowledge and confidence after the trainings in obstetrical emergencies [15–19]. However, the studies had several limitations, including being single-center studies with no randomization of the participants allocated to different training groups. There is a need for innovative training methods with more emphasis on team rather than individual training, especially in obstetrics, which is behind in using simulation as a training method [20,21].

To improve maternal and newborn health care in Lithuania, Standardized Trainings in Obstetrical Emergencies (STroBE) was designed. Trainings were conducted across

Lithuania including the majority of the hospitals providing secondary and tertiary obstetrical and neonatal care for the first time. It was expected that STroBE would improve maternal and neonatal health care through equipping obstetricians and midwives with up-to-date knowledge and hands-on experience. Based on previous studies [10,15–19,22–24], we expected to find that participants' self-reported knowledge and confidence would increase after the trainings and that the impact would potentially be long-lasting.

2. Materials and methods

Newly developed STroBE was based on positive experience of ALSO® courses in Lithuania [23] and other countries [18,19,24,25]. STroBE was performed in 27 of the 32 Lithuanian hospitals, which provide 95% of secondary and tertiary obstetric and neonatal care. While in ALSO® course [26] learning occurs via syllabus reading, didactic lectures, and hands-on skills stations, in STroBE we used a learning method including online material and hands-on simulation training with a multidisciplinary team-based approach. The online material consisted of lectures, videos, and algorithms based on national diagnostic and treatment guidelines of perinatal care. These national guidelines were presented in 2015 and their content on the relevant topics to the trainings was based on the international clinical guidelines (i.e. [27–35] and alike). During STroBE the participants acted in the groups of three (in roles of a leader, an assistant, and an assessor). To simulate a real situation that might occur in obstetric emergency, participants had to solve several scenarios according to the standardized algorithms (Fig. 1) on mannequins using medical equipment. The next focus of the trainings was to enhance the teamwork of participants by assuming previously mentioned roles. Participants acted out situations in groups of three by changing roles for each algorithm so that everyone played all the roles, and give in-session feedback to each other. The evaluation and consultation of the supervisor, which was relevant in ALSO® courses, was excluded in order to reduce the number of instructors and trainings duration. Nonetheless, during every course there was one instructor, who was ready to help to teams if needed.

A prospective longitudinal design was undertaken over four time periods: before, immediately after, 6 weeks after, and 6 months after the trainings. We used a multiple-choice

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