https://doi.org/10.15218/ejnm.2025.20 Erbil j. nurs. midwifery, Vol. 8, No. (2), Nov 2025
Original Article

Effectiveness of Essential Care for Every Baby Program on Nurses-Midwives Knowledge and Skills in Soran Independent Administration

Govend Faisel Mehmood; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil. Pediatric and Maternal Teaching Hospital-Soran, General Directorate of Health-Soran, Ministry of Health, Kurdistan Region, Iraq.*
(Correspondence: govendnurse@gmail.com).
Kaify Jamil Qadir; *Department of Nursing, College of Nursing, Hawler Medical University, Erbil, Kurdistan Region, Iraq.*

ABSTRACT

Background and Objectives: Essential Care for Every Baby is an evidence-based education program aimed at improving the intellectual knowledge and skills of providers who provide basic newborn care. The aim of this study is to evaluate the effectiveness of the Essential Care for Every Baby training program in improving the knowledge and skills of nurse-midwives who participate in the training.

Methods: A quasi-experimental one-group pre-post study was carried out in seven health settings in Soran Independent Administration, Erbil City, Iraq. A sample of 40 nurse-midwives was recruited for the study; the training program was conducted at the Nursing and Midwifery Development Centre in Erbil City. A self-reporting form was used for data collection of sociodemographic, knowledge, and observation checklists for skills of the participants on essential newborn care. Data were analyzed by using SPSS version 27 statistical analysis.

Results: Out of 40 nurse-midwives, 32.5% were aged between 22-27 years old and 55% had a diploma. In the pretest, only 2.5% of participants achieved a satisfactory score in the knowledge multiple-choice questions. Following the training, the majority of participants, 85%, achieved a satisfactory score. Based on a paired t-test, there was a significant improvement in knowledge mean from 14.40 (SD = 3.01) in the pretest to 21.85 (SD = 2.17) (mean difference = -7.45, t(39) = -16.61) with a P-value <0.001. None of the participants reached a satisfactory level in Objective Structured Clinical Examinations A (well baby) and Objective Structured Clinical Examinations B (baby with problem) in the pretest; however, 95% reached a satisfactory level in both assessments in the posttest. Skills also showed significant improvement via paired t-test. Objective Structured Clinical Examinations A (well baby) improved from 7.70 (SD = 3.55) to 18.45 (SD = 1.69) (mean difference = -10.75, t(39) = -18.45) and Objective Structured Clinical Examinations B (baby with problem) from 3.63 (SD = 2.15) to 12.10 (SD = 1.11) (mean difference = -8.48, t(39) = -21.26) with a P-value <0.001 for both.

Conclusion: The significant improvement in both knowledge and skills following the training indicates the effectiveness of the Essential Care for Every Baby program in enhancing clinical competencies among nurse-midwives.

Keywords: Effectiveness; Essential Care for Every Baby; Nurses-Midwives; Knowledge; Skills.

Received: 29/03/2025 *Accepted: 05/07/2025* *Published: 30/11/2025*

INTRODUCTION

The first day of life is the most critical for newborn survival. Within the first week of life, newborns are highly susceptible to illness. An alarming number of newborns also die within a few days of delivery. A newborn is approximately 500-fold more likely to die on the first day of life compared to at one month of age [1]. By 2022, 2.3 million newborns had died within the first 28 days after birth worldwide, which represented 47% of under-five deaths. Sub-Saharan Africa and South and Central Asia are the most affected areas, with the largest numbers of newborn fatalities, with 27 deaths for every 1,000 live births in 2022. The chance of death during the first month of life is 11 times greater in Sub-Saharan Africa compared to the countries with the least mortality rates, like Australia and New Zealand. The Newborn Mortality Rates (NMRs) ranged from 0.7 to 39.4 per 1000 live births, and a baby born in the most lethal country would have a 60-fold increased chance of death [2]. In Iraq, the 2023 infant mortality rate is 21.137 deaths per 1000 live births, a 2.73% reduction from 2022. In 2022, the rate was 21.731 deaths per 1000 live births, down 2.66% from 2021 [3]. As documented by the Ministry of Health records in KRG, newborn mortality has been in continuous decline from 2011 to 2022. Mortality rates for 2011 for less than five years: 32 out of 1,000 children, for less than a year: 28 out of 1,000, and for less than a month: 21 out of 1,000. In 2022, these rates continued their decline due to the excellent development of healthcare and infrastructure of hospitals within the Kurdistan Region. Under five years of age, mortality rates fell to 10.2 in every 1,000 children; under one year of age, it fell to 8.7 per 1,000; while below one month, it reached 5.8 out of 1,000. While the global rate stands at 18 deaths per 1,000 children, the Kurdistan Region has reported 5.8 deaths per 1,000 children, a rate lower than Bahrain, Iran, and Iraq, and very close to that of Qatar and the United Arab Emirates [4]. Prematurity (11.1%), infection during the neonatal period (34.3%), and asphyxiation during delivery (47.5%) are responsible for 93% of NMR, and most neonatal deaths happen within the first week of life [5]. Eighty-one percent of deaths were attributed to delays in seeking care outside the home. Transportation delays and health facility delays were responsible for 3% and 16% of deaths, respectively [6]. A healthier country in the future comes from today's healthy children. A baby requires constant attention and supervision. As it affects the child's overall health and, subsequently, adult life, the neonatal period is significant. As far as adapting well from intrauterine to extrauterine life is concerned, birth is very stressful for the baby. The baby must adapt well and deeply to make changes in its physiology so that it can tolerate the transition from intrauterine to extrauterine life. Even if they are born with normal birth weights, neonates are at risk for a number of health problems. Newborns require the greatest possible care in order to have a better chance of survival, as they have exceptionally high rates of sickness and mortality [7]. A study of newborn health indicators revealed that the absence of trained attendants who provide the necessary care for babies is the leading cause of newborn death in low- and middle-income countries. Newborns have low-cost basic needs in this regard, which can easily be met through applying effective interventions [8]. Essential Newborn Care (ENC) is a package of evidence-based preventive, monitoring, and management interventions suggested by international health partners with the World Health Organization [9].

Essential Care for Every Baby (ECEB) is a care package which includes keeping babies warm, feeding them breast milk early and exclusively, assisting families to practice good hygiene and recognizing danger signs that save lives. Essential newborn care beyond resuscitation, or ECEB, is a training package that covers the basic essential newborn care elements that were not adequately addressed in Helping Babies Breathe (HBB), such as skin-to-skin care, early initiation of breastfeeding (EIBF), eye care, and vitamin K [10]. Essential Care for Every Baby (ECEB) is an evidence-based teaching curriculum that was developed by the American Academy of Pediatrics in collaboration with international experts to improve the cognitive knowledge and skills of healthcare providers in low-resource settings regarding care for newborns. The course covers the immediate newborn care from birth through the first day or until discharge from the facility [11,12]. Studies indicate that newborn care trainings significantly reduce neonatal mortality and stillbirth rates. More specifically, evaluation of the ECEB training program showed that it has improved the health providers' knowledge significantly from pre-test to post-test [10]. According to a study, 25 % of health care providers lack adequate knowledge in essential newborn care, 28% do not practice effective essential newborn care, and only 9.8% have knowledge of infant resuscitation [13]. Skilled delivery care by the competent nurse-midwife practitioner is highly necessary in offering quality health services for saving the lives of women and babies. However, although nurse-midwives play a vital role in improving newborn health, their knowledge and capacity in delivering maternity health services remain uneven in developing countries. The cause of neonatal death was the inadequate knowledge of neonatal care among Newborns health personnel [14].

admitted to official healthcare institutions are frequently managed by general nurses, midwives, and nursing assistants. Therefore, strengthening the expertise of healthcare personnel is a critical function of these health institutions. Increasing women's access to instructional messages and therapies decreases infant morbidity and mortality. Consequently, appropriate neonatal care is vital for survival, development, and growth [15]. Seventy-five percent of newborn mortality is prevented at birth and after birth, respectively, if ENC is provided by a trained nurse and/or midwife. However, in a study conducted in Nigeria, three-quarters of the nurses and midwives lack the necessary skills to provide ENC. This finding also goes against the recommendation by the World Health Organization on the provision of ENC for all newborn babies by a trained provider [16]. Most nurses and midwives did not provide appropriate initial nursing care to newborns immediately after birth. The study recommended improving the qualification and skills of the nurses and midwives through training programs and implementation of guidelines for improving the quality of immediate newborn care in the delivery room [17]. While local training activities are conducted, no published studies from specialized hospitals in the Kurdistan Region were identified that evaluate structured training in this context. This identified gap highlights the necessity of the present study. Therefore, the aim of this study is to evaluate the effectiveness of the Essential Care for Every Baby training program in improving the knowledge and skills of nurse-midwives working in the Soran Independent Administration.

METHODS

A quasi-experimental design with one-group pre-post intervention was carried out involving nurses-midwives employed in

seven health settings in Soran Independent Administration, Erbil, Iraq. These settings include Pediatric and Maternal Teaching Hospital-Soran, Choman General Hospital, Ble General Hospital, Mergasor General Hospital, Rawanduz General Hospital, Sidekan Health Center, Qasre Health Center, and Helav Private Hospital. The training intervention and data collection were conducted in the Nursing and Midwifery Development Centre (NMDC) in Erbil City. In collaboration with the General Directorate of Health-Soran, NMDC held a training course for nurses and midwives about Essential Care for Every Baby in September and October 2024. The Nursing and Midwifery Development Centre is a nonprofit organization that promotes midwifery and nursing in the Middle East by means of initiatives, lobbying, research, ongoing professional development, and consulting services. Currently, their base is in Erbil, the capital of Iraq's Kurdistan Region [18]. Prior to data collection, official permission was obtained from Hawler Medical University/ College of Nursing directed to NMDC, Ministry of Health in the Kurdistan region/Iraq: General Directorate of Health-Soran sent to the health settings in Soran Independent Administrative. This study started on 5th August 2024 and lasted until early February 2025. The total sample in Soran health settings was about 80 nurses and midwives who were working in the delivery room, pediatric and neonatal care unit (NCU), and emergency unit within Soran health settings. Out of 80 samples, 40 of them attended ECEB training. A non-probability purposive convenience sampling method was used to select the participants based on working directly in the relevant clinical units and their availability for training. Nurses and midwives working in the delivery room, pediatric and neonatal care unit, and emergency unit in health settings in Soran Independent Administration, desire to participate in the study. Nurses and midwives with different levels of education were included. The data collected through the use of self-reporting and observation consists of three parts: Part I: Sociodemographic characteristics, which include age, marital status, level of education, job title, unit of work, years of experience in nursing, years of experience in a recent unit, and training regarding essential newborn care. Part II: Knowledge assessment, which consists of 25 standardized MCQs [19]. The participant gets 1 score for the correct answer and zero for the wrong answer or missed. Getting ≥ 80% (20 in 25) was needed to achieve a satisfactory score [20]. The assessment was the ECEB knowledge check validated by the American Academy of Pediatrics [10]. Part III: Participant's skills assessed by observation by using 2 scenarios based on the Objective Structured Clinical Examination (OSCE) in pre- and post-training, OSCE A for a well-baby, which consists of 20 items; successful completion requires a total score of 16 correct of 20 (Done); and OSCE B for a baby with a problem, successful completion requires a total score of 10 correct of 13 (Done). Getting ≥ 80% was needed to reach a satisfactory level in the examinations [21]. The ECEB program is adapted from WHO ENC guidelines. Following the resuscitation of the newborn baby, it focuses on the skin-to-skin contact with early initiation of breastfeeding, disease prevention through proper eye and cord care, and vitamin K administration, and assessment and classification of the newborn baby [22]. This program educates healthcare providers on fundamental neonatal care practices to ensure the health and well-being of all neonates from birth until discharge from the facility. The care is divided into three phases according to the time elapsed post-birth: phase 1 (0 to 60 minutes), phase 2 (60 to 90 minutes), and phase 3

(90 minutes–24 hours) [23]. The Essential Care for Every Baby provider course was implemented by 3 trainers of the NMDC in collaboration with a researcher. The training lasted one day for each group, with fewer than 15 participants per group, conducted from 16 September to 1 October 2024. It began with a pretest to assess participants' knowledge using multiple-choice questions (MCQs) and their skills through two scenario-based Objective Structured Clinical Examinations (OSCEs). Materials used for demonstration and simulation like smartboard, action plan, flipchart, providers guide in Kurdish, parents' guide, Neo-Natalie and MamaBreast. Discussions have been done by asking the participant questions. There were breaks to refresh the participants. After completion of the training, posttests have been done immediately by using the same assessment tools. Ethical approval was obtained before the study. The participants were confidential and assumed a volunteer nature. The researcher obtained this permission from the ethical committee of Hawler Medical University/ College of Nursing with Number 2448 on 29/8/2024. Verbal and written approval was obtained from nurse-midwives to participate in the study. Data were analyzed by using SPSS version 27 statistical analysis. Statistical methods included descriptive data analysis, which is conducted through frequency, percentage, mean, and standard deviation. Additionally, a paired-sample t-test was employed to compare pretest and posttest results with statistical significance set at a P-value < 0.05.

RESULTS

In this study, 40 nurse-midwives participated, Table 1 shows that the highest percentage of participants' ages, 32.5%, were between 22-27 years old, while the least, 7.5%, were 46-52 years old (mean and SD : 34.00 ± 8.901). Exactly 50% of participants were single, and 47.5 % were married. More than half of participants, 55%, had a diploma-level education, while participants who had a master's degree were the least at 2.5%. Less than half of participants, 47.5%, were midwives, while 15% of them were nurse assistants. Half of the participants, 50%, were permanent, while only 5% were contract. In this study, most of the participants, 67.5%, worked in the delivery room, while 15% of them worked in the emergency unit. The highest percentage of participants, 42.5%, had less than 6 years of experience in nursing, while 5% had 6-10 years of experience in nursing (mean and SD: 11.20 ± 9.174). Nearly half of the participants, 47.5%, had less than 6 years' experience in recent units, while 7.5% of them had more than 20 years of experience in recent units (mean and SD: 7.68 ± 6.806). The majority of the participants, 85%, had not received any training in essential newborn care, while only 15% had received such training. Table 2 illustrates that in the pretest, only one participant, 2.5%, achieved a satisfactory score in knowledge while following the training, the majority of participants, 85%, achieved satisfactory score. As shown in Table 3, using a paired t-test, there was a significant improvement in knowledge mean from 14.40 (SD = 3.01) in the pretest to 21.85 (SD = 2.17) in the posttest with a mean difference of -7.45, t (39) = -16.61, and a P-value <0.001. As demonstrated in Table 4 in the pretest, none of the participants, 0%, reached a satisfactory level in OSCE A and B; however, after the training, the vast majority, 95%, reached a satisfactory level in both OSCEs. Table 5 clarifies that, using a paired t -test, there was a significant improvement in the OSCE A mean from 7.70 (SD = 3.55) to 18.45 (SD = 1.69) (mean difference = -10.75, t(39) = -18.45) and the

OSCE B mean improved from 3.63 (SD = 2.15) to 12.10 (SD = 1.11) (mean difference = -8.48, t(39) = -21.26), both with a P-value <0.001.

Table 1: Socio demographic characteristics of nurses-midwives

Items	Categories	F. (%)
Age group	22-27 years old	13(32.5)
	28-33 years old	7(17.5)
	34-39 years old	8(20)
	40-45years old	9(22.5)
	46- 52years old	3(7.5)
	34.00 ± 8.901	
Level of education	Training course	6(15)
	Secondary school	9(22.5)
	Diploma	22(55)
	BSc	2(5)
	Master	1(2.5)
Job title	Nurse	15(37.5)
	Midwife	19(47.5)
	Nurse assistant	6(15)
Marital status	Single	20(50)
	Married	19(47.5)
	Divorced	1(2.5)
Type of employment	Permanent	20(50)
	Contract	2(5)
	Volunteer	18(45)
Unit of work	Delivery room	27(67.5)
	NCU an pediatric unit	7(17.5)
	Emergency	6(15)
Years of experience in general	< 6 years	17(42.5)
	6 - 10 years	2(5)
	11 - 15 years	6(15)
	16 - 20 years	7(17.5)
	> 20 years	8(20)
	11.20 ± 9.174	
Experience in unit	< 6 years	19(47.5)
	6 - 10 years	9(22.5)
	11 - 15 years	5(12.5)
	16 - 20 years	4(10)
	> 20 years	3(7.5)
	7.68 ± 6.806	
Have you received any training regarding ENC	Yes	6(15)
	No	34(85)

Table 2: Distribution of Participants' Knowledge Levels in Pretest and Posttest

Items n = 40	Satisfactory F. (%)	Unsatisfactory F. (%)
Pretest	1(2.5)	39(97.5)
Posttest	34(85)	6(15)

Table 3 : Paired t-test Comparison of Knowledge Scores Before and After Intervention

Items n = 40	Mean	MD	SD	*t*	*df*	P-value
Pretest	14.40	-7.45	3.011	-16.608	39	<0.001
Posttest	21.85		2.167			

Table 4: Distribution of Participants Clinical Skills Completion Status in Pretest and Posttest

Items n= 40		Satisfactory F. (%)	Unsatisfactory F. (%)
OSCE A	Pretest	0(0)	40(100)
	Posttest	38(95)	2(5)
OSCE B	Pretest	0(0)	40(100)
	Posttest	38(95)	2(5)

Table 5: Paired t-test Comparison of OSCE A and OSCE B Scores Before and After Intervention

Items n= 40		Mean	MD	SD	*t*	*df*	P-value
OSCE A	Pretest	7.70	-10.75	3.546	-18.452	39	<0.001
	Posttest	18.45		1.694			
OSCE B	Pretest	3.63	-8.475	2.145	-21.257	39	<0.001
	Posttest	12.10		1.105			

Note: F = Frequency; % = Percentage; SD = Standard Deviation; MD = Mean Difference; df = Degrees of Freedom; t = t-statistic. Statistical significance set at $p < 0.05$.

DISCUSSION

The study noted that, regarding level of education, more than half of the participants had a diploma. This demonstrates that most of the samples have completed a program that is typically shorter than a bachelor's degree. This may indicate that the staff has a stronger vocational rather than academic orientation. This result is consistent with many studies in which most of the participants had diplomas, like these studies done in Ethiopia (Dina et al., 2022 at 60%, Abdu et al., 2019 at 59.9% and Yosef et al., 2021 at 52.2%) [6,1,5]. These results were inconsistent with Tasew et al., 2019 and Ayenew et al., 2020 in Ethiopia, who mentioned that the highest percentage of the participants were degree holders [15,24]. In this study, most of the participants worked in the delivery room, emphasizing the importance of these health workers in mother and baby care. This agrees with Kousar et al., 2022a in Pakistan, that 58.3% of the participants were from the labour room [7]. This result disagreed with Kousar et al., 2022b, that the majority, 91%, of the participants worked in the labor room [25]. The study found that nearly half of the participants had less than 6 years' experience in recent units, representing a reasonably high influx or a recent entry of new staff in the units. This aligns with the study done in Nigeria by Esan et al., 2020 that demonstrated 60.7% of respondents have less than 5 years working within their present institution [26]. In this study the majority of the

participants have not received any training regarding essential newborn care, which indicates there is a deficiency of chances for healthcare professionals to develop skill in newborn care. This is similar to the results of Mekuria, 2022 in Ethiopia, which showed that only 27.5% of respondents took training on newborn care [27]. In contrast, Ali and Ghafel, 2022 and Musawi et al., 2023 in Iraq reported that the majority of participants, 86% and 80% had taken training, respectively [13, 3]. The study found that in the pretest only a small minority of participants achieved a satisfactory score in the knowledge MCQs. This is demonstrating the deficiency of information before training and emphasizing the necessity for educational training. After the training, the majority of participants achieved satisfactory scores in the MCQ exams. This denotes a large improvement (82.5%) in knowledge, highlighting the effectiveness of the training program. There are many studies that support the results of the study. A study done in Iraq by Musawiet al., 2023 showed that only 10% of samples represent good knowledge about immediate neonatal care [3]. According to Thukral et al., 2015, the study involved testing at two global sites (India and Kenya). In India, 30% of learners passed the pre-course test, while 87% of learners passed the post-course test. In Kenya, 48% learners passed the pre-course test while 84% passed the post-course test. The knowledge MCQ results overall suggest the course was effective in enhancing participants' knowledge [11]. Dol et al., 2019 in Tanzania reported that 95.8% of learners received a passing score after ECEB training, while it was 66.7% before training [20]. From the results of Chinbuah et al., 2020 in Ghana, they achieved high knowledge acquisition. Test results (pre-post) were (89.0–99.6%) for ECEB [28]. The current study stated that there was highly significant improvement in knowledge from a mean of 14.40 in the pretest to 21.85 with a P-value <0.001 which demonstrates that ECEB training successfully improved the participants' subject-matter knowledge, as supported by a p-value of <0.001, which justifies the improvement's statistical significance. Many studies have shown improvement in knowledge after training; for example, in Isfahan, Iran, Jourabian et al., 2021 noted the pre-test and post-test percentages of right answers for the ECEB MCQ were 20.79 and 23.94, respectively, indicating a significant gain in knowledge [8]. Amsalu et al., 2020 in Bossaso, Somalia, reported that after training, providers' knowledge increased by an average of 11.9% (7.2 to 16.6), p-value < 0.001 [29]. According to Dol et al., 2019 the learners' pretest knowledge mean score was 20.3, and their posttest mean score was 23.5, with a p-value of <0.001 [20]. McNelis et al., 2022 found that knowledge check results for the first set of workshops increased from an average of 19.1 right answers to 25 questions before the workshop to 23.4 right answers after the workshop [12]. Gamtessa et al., 2021 conducted a study in Ethiopia and stated that the trainees' total mean (standard deviation) knowledge score rose from 59.10 (SD ± 13.180) prior to training to 73.73 (SD ± 14.173) following training with P <.001 [10]. Thukral et al., 2015 conducted a study in India and Kenya: in India, they reported that post-course scores' knowledge was improved significantly from pre-course levels (mean 24.8 vs. 19.4), p < 001. In Kenya, post-course scores vs. pre-course scores (mean 25.1 vs. 20.8, p = 0.004) [11].The study noted that in the pretest none of the participants reached a satisfactory level in OSCE A and OSCE B successfully; however, the vast majority of the participants reached a satisfactory level in both OSCEs after the

training. This means a clear effect of the training program on skills was applied; also, this refers to improving the participants' ability to perform OSCE A and B tasks. The pretest results are consistent with findings from several previous studies. In Jamsheer and Shaker's 2018 study in Erbil, the majority of midwives and nurses provided poor-quality care for newborns. The newborn received poor initial nursing care from the majority of the nurses/midwives in the delivery room [17]. In Baghdad/Iraq, Hussein and Abbas's 2021 study results showed that 68% of the subjects (nurses-midwives) reported an unacceptable level of performance in newborn care before the implementation of an educational program [14]. Post-training results are consistent with international studies. The findings of the Kousar et al., 2022a study demonstrated that the participants' competent practice score was 16.7% prior to the educational intervention and 93.8% following it [7]. Tosif et al., 2020 illustrated that in terms of skills, the average score for the Breathing Baby scenario increased from 20% at baseline to 95% after coaching. For the Non-Breathing Baby scenario, the average score increased from 63% pre-coaching to 86% after coaching [30]. Thukral et al., 2015 reported that after training, 90% of learners in India passed the OSCE A. In Kenya, 94% of learners who participated passed OSCE A. In India, 94% of learners passed the OSCE B. 92% of learners in Kenya passed the OSCE B[11]. McNelis et al., 2022 found that everyone who took part in the study passed the OSCE [12]. Chinbuah et al., 2020 showed in all regions of the study, the overall ECEB OSCE pass rate was 99.9% [28]. This study stated that OSCE A improved from 7.70 to 18.45 and OSCE B from 3.63 to 12.10 with a P-value <0.001 for both. This indicates that training improved practical skills. This demonstrates how effective the training is in preparing individuals for real-life situations. ECEB training considerably improved participants' competencies in various assessment areas. This represents a highly statistically significant enhancement in practical skills after the instruction. The very small p-value indicates that the results are very unlikely to be the result of chance. These results were consistent with other studies that have shown significant improvement in skills after training. For instance, Jourabian et al., 2021 found that after training, the mean score on the ECEB OSCE A increased significantly from 5.2 on the pretest to 19.2 on the post-test, indicating strong passing. With an average score of 0.94 on the pretest and 12.35 on the posttest, ECEB OSCE B demonstrated notable progress and high pass rates following training [8]. Thukral et al., 2015 showed that in India and Kenya the mean OSCE A score for learners was 17.6. In India, the mean OSCE B results for learners were 15.1. In Kenya, the mean OSCE B score was 13.9 [11].

CONCLUSION

As the main objective of this study was assessing the effectiveness of the Essential Care for Every Baby program on nurse-midwives knowledge and skills, the results of the study concluded that only a small minority of the participants achieved a satisfactory score in knowledge and none of them reached a satisfactory level in OSCE A and B skills in the beginning. Following applying the program, the majority of them achieved a satisfactory score in knowledge and reached a satisfactory level in OSCE A and B skills. The significant improvement in both knowledge and skills following the training indicates the effectiveness of the Essential Care for Every Baby program in enhancing clinical competencies among nurse-midwives.

ACKNOWLEDGEMENTS

The authors would like to thank Hawler Medical University/College of Nursing, General Directorate of Health-Soran and Pediatric and Maternal Teaching Hospital-Soran, along with other health settings within the Soran Independent Administration and Nursing and Midwifery Development Centre (NMDC) in Erbil City, for their permission and cooperation. We also thank nurses and midwives who gave their time for participating in the study.

CONFLICT OF INTERST

There is no conflict of interest.

FUNDING

There is no funding for the study.

REFERENCES

[1] Abdu H, Gebrselassie M, Abdu M, Mare KU, Tadesse W, Liben ML. Knowledge and practice of immediate newborn care among midwives and nurses in public health facilities of Afar regional state, Northeast Ethiopia. *BMC Pregnancy and Childbirth*. 2019;19(1):422. https://doi.org/10.1186/s12884-019-2581-3.

[2] World Health Organization. Newborn mortality 2024. Available from: www.who.int/news-room/fact-sheets/detail/newborn-mortality [Accessed 1st November 2024].

[3] Musawi MA, Fakhry FA, Mahmud HS. Nurse's Knowledge Associated with the Routine Essential Newborn Care after Birth in Baghdad City. *Journal of Pioneering Medical Science*. 2023;12(4):57–62. https://doi.org/10.61091/jpms202312413.

[4] Kurdistan Regional Government. Kurdistan Region records its lowest Maternal Mortality Rate in 2022. Available from: https://gov.krd/dmi-en/activities/news-and-press-releases/2023/july/kurdistan-region.records-its-lowest-maternal-mortality-rate in-2022/ [Accessed 20th November 2024

[5] Yosef T, Getachew D, Weldekidan F. Health professionals' knowledge and practice of essential newborn care at public health facilities in Bench-Sheko Zone, southwest Ethiopia. *Heliyon*. 2021;7(11):e08369. https://doi.org/10.1016/j.heliyon.2021.e08369.

[6] Dina H, Bayisa D, Emana D, Demissie M. Assessment of Factors Associated With Practice and Knowledge of Essential Newborn Care Among Nurse and Midwives in Assosa Zone Governmental Health Facilities, Western Ethiopia. *Journal of Clinical Nursing & Reports.* 2022;1(1):01-09. https://doi.org/10.21203/rs.3.rs-1210942/v1

[7] Kousar R, Afzal M, Parveen K, Khan S. Effect of Educational Program on Nurses Essential Care Practices of Newborn Baby. *Pakistan Journal of Medical and Health Sciences* 2022;16(2):1149–1152. https://doi.org/10.53350/pjmhs221621149.

[8] Jourabian A, Jafari-Mianaei S, Ajoodanian NajmehDr. Evaluating the implementation of helping babies survive program to improve newborn care conditiona. *Journal of Education and Health Promotion.* 2021;10(1):373. https://doi.org/10.4103/jehp.jehp_53_21.

[9] Rajapuri AS, Ravindran R, Horan K, Bucher S, Purkayastha S. Essential Care for Every Baby: Neonatal Clinical Decision Support Tool. In: Kalra J, Lightner NJ, editors. Advances in Human Factors and Ergonomics in Healthcare and Medical Devices, vol. 1205, Cham: Springer International Publishing; 2020. p. 189–196.https://doi.org/10.1007/978-3-030-50838-8_26.

[10] Gamtessa LC, Kebede KM, Deyas Y. Knowledge Outcome of Essential Care for Every Baby Training in Southern Nations, Nationalities, and People's Region, Ethiopia: A Pre- and Post-Test Study. *Global Pediatric Health* 2021;8:2333794X211012983. https://doi.org/10.1177/2333794X211012983.

[11] Thukral A, Lockyer J, Bucher SL, Berkelhamer S, Bose C, Deorari A, et al. Evaluation of an educational program for essential newborn care in resource-limited settings: Essential Care for Every Baby. *BMC Pediatrics* 2015;15:71 https://doi.org/10.1186/s12887-015-0382-z.

[12] McNelis K, Prasanphanich N, Martin-Herz SP, Carter T, Merchant HF, Patterson J, et al. Adaptation of Essential Care for Every Baby educational program to improve infant outcomes in the context of Zika. *BMC Pediatrics*

2022;22:669.https://doi.org/10.1186/s12887-022-03710-7.

[13] Ali SH, Ghafel HH. Nurse-Midwives' knowledge and practices about immediate newborn care. *International Journal of Health Sciences.* 2022;6(S1):8915–8940. https://doi.org/10.53730/ijhs.v6nS1.7033.

[14] Hussein WA, Abbas IM. Effectiveness of Education Program on Nurse-Midwife's Performance Regarding Immediate Newborn Care in Delivery Rooms at Maternity Hospitals in Baghdad City/Iraq. *Annals of the Romanian Society for Cell Biology.* 2021;25(4):8013–8024. Available from: http://annalsofrscb.ro/index.php/journal/article/view/3500

[15] Tasew H, Teshale T, Bahrey D, Mariye T, Teklay G. Immediate newborn care of knowledge, practice and associated factors among health care providers in Northwestern Zonal health facilities Tigray, Ethiopia, 2018. *BMC Research Notes.* 2019;12(1):427. https://doi.org/10.1186/s13104-019-4465-z.

[16] Bakar SA, Joho AA. Assessing Essential Newborn Care Knowledge, Skills and Associated Factors among Nurses/Midwives in Zanzibar: A Cross-Sectional Study. *East African Health Research Journal.* 2023;7(1):58–66. https://doi.org/10.24248/eahrj.v7i1.709.

[17] Jamsheer KM, Shaker NZ. Quality of Immediate Nursing Care Provided to Newborn at Maternity Teaching Hospital in Erbil City. *Erbil Journal of Nursing & Midwifery* 2018;1(1):33–41. https://doi.org/10.15218/ejnm.2018.05.

[18] Nursing & Midwifery Development Centre. Home page. Available from: https://www.nmdconline.org/ [Accessed 5th January 2025.

[19] American Academy of Pediatrics. Essential Care for Every Baby (ECEB) Knowledge check. Available from: https://downloads.aap.org/AAP/PDF/hbs_eceb_knowledgecheck.pdf [Accessed 20th June 2024].

[20] Dol J, Campbell-Yeo M, Bulemela J, McMillan D, Abel Z, Nyamtema A, et al. Knowledge acquisition after Helping Babies Survive training in rural Tanzania. *International Health* 2019;11(2):136–142. https://doi.org/10.1093/inthealth/ihy068.

[21] American Academy of Pediatrics. Essential Care for Every Baby (ECEB) Skills. Available from: https://downloads.aap.org/AAP/PDF/hbs_eceb_osces.pdf [Accessed 20th June 2024].

[22] Perez K, Patterson J, Hinshaw J, Escobar C, Parajon D, Parajon L, et al. Essential Care for Every Baby: improving compliance with newborn care practices in rural Nicaragua. *BMC Pregnancy and Childbirth* 2018;18(1):371. https://doi.org/10.1186/s12884-018-2003-y.

[23] Nuthakki S, Bucher S, Purkayastha S. The Development and Usability Testing of a Decision Support Mobile App for the Essential Care for Every Baby (ECEB) Program. In: Stephanidis C, Antona M, editors. HCI International 2019 – Late Breaking Posters, vol. 1088, Cham: Springer International Publishing; 2019, p. 259–263. https://doi.org/10.1007/978-3-030-30712-7_33.

[24] Ayenew A, Abebe M, Ewnetu M. Essential Newborn Care and Associated Factors Among Obstetrical Care Providers in Awi Zone Health Facilities, Northwest Ethiopia: An Institutional-Based Cross-Sectional Study. *Pediatric Health, Medicine and Therapeutics.* 2020;11:449–458. https://doi.org/10.2147/PHMT.S276698.

[25] Kousar R, Afzal M, Qadir A, Sakina R, Asim Amin M. A Cross sectional Study on Nurses Knowledge and Practice of Essential Newborn Care at Tertiary Care Hospitals of Bahawalpur: Nurses Knowledge and Practice of Essential Newborn Care at Hospitals. *Pakistan Journal of Health Sciences* 2022;3(6):19–25.https://doi.org/10.54393/pjhs.v3i06.305.

[26] Esan DT, Adedeji OA, Bello CB, Omolafe MC. Knowledge and practices of immediate newborn care among midwives in selected health care facilities in Ekiti State, *Nigeria. Pan African Medical Journal*. 2020;37:263. https://doi.org/10.11604/pamj.2020.37.263.24628.

[27] Mekuria F. Knowledge of Essential Newborn Care among Nurses and Midwives Working in Lideta Sub City Government Health Centers. *Journal of Nursing & Care.* 2022;11(1):507. Available from: https://www.hilarispublisher.com/open-access/knowledge-of-essential-newborn-care-among-nurses-and-midwivesworking-in-lideta-sub-city-government-health-centers-84652.html [Accessed 11th December 2024.

[28] Chinbuah MA, Taylor M, Serpa M, Mazia G, Cofie PK, Kwarah W, et al. Scaling up Ghana's national newborn care initiative: integrating

"helping babies breathe" (HBB), "essential care for every baby" (ECEB), and newborn "infection prevention" (IP) trainings. *BMC Health Services Research.* 2020;20(1):739. https://doi.org/10.1186/s12913-020-05225-2.

[29] Amsalu R, Morris CN, Hynes M, Had HJ, Seriki JA, Meehan K, et al. Effectiveness of clinical training on improving essential newborn care practices in Bossaso, Somalia: a pre and postintervention study. *BMC Pediatrics*. 2020;20(1):215. https://doi.org/10.1186/s12887-020-02120-x

[30] Tosif S, Jatobatu A, Maepioh A, Gray A, Sobel H, Mannava P, et al. Healthcare worker knowledge and skills following coaching in WHO early essential newborn care program in the Solomon Islands: a prospective multi-site cohort study. *BMC Pregnancy and Childbirth.* 2020;20(1):84. https://doi.org/10.1186/s12884-020-2739-z.