Knowledge Outcome of Essential Care for Every Baby Training in Southern Nations, Nationalities, and People's Region, Ethiopia: A Pre- and Post-Test Study

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Abstract

This study was aimed to evaluate the knowledge outcome of ECEB training given to reduce neonatal mortality in Ethiopia. The study was conducted by using data from training given for 98 health professionals. Data were entered into Epi info7 and analyzed by SPSS version 21. Accordingly, the paired sample *T*-test, the independent sample *t*-test, and one way ANOVA were calculated at *P*-value <.05. Likewise, the mean knowledge score of the trainees increased from 59.10 (SD $\pm$ 13.180) before the training to 73.73 (SD $\pm$ 14.173) after the training. The increment was statistically significant (t (97) = 11.684, CI = 12.147-17.118, $P < 0.001$). The mean knowledge score was significantly varied between female and male trainees at pre-test t (96) = 2.424, $P = .017$ and post-test t (96) = 2.944, $P = .004$. Similarly, it was significantly varied between trainees from hospitals and Health centers at post-test t (96) = 2.403, $P = .018$. To sum up, the overall knowledge outcome of trainees significantly improved after the training. However, regarding knowledge outcome in relation to different variables, there was a significant mean knowledge score difference by sex both at pre- and post-test. Concerning the knowledge outcome in relation to facility type of the trainees, knowledge outcome significantly increased only those who came from hospitals at post-test. Therefore, to further enhance female trainees and those who come from Health Centers, a separate training session with extra support should be arranged by programmers.

Introduction

Neonatal mortality was declined by 51% between 1990 and 2017 worldwide.[1] Ethiopia has planned to reduce the Neonatal Mortality Rate (NMR) from 28 to 11/1000 by 2020.[2] Nevertheless, the recent national survey result showed high NMR accounted for 30 deaths per 1000 live births.[3]

The American Academy of Pediatrics (AAP) introduced 2 interrelated, simplified, and low-cost curricula for teaching evidence-based newborn care in resource-limited setting. These 2 interrelated curricula are Helping Babies Breathe (HBB) and Essential Care for Every Babies (ECEB).[4,5] Essential Care for Every Baby (ECEB) is a care that comprises keeping babies warm, feeding breast milk early and exclusively, helping families practice good hygiene, and recognize Danger Signs that save lives.[5] ECEB is an educational program that addresses basic elements of Essential Newborn Care not addressed by HBB such as

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skin-to-skin care, early initiation of breast feeding (EIBF), eye care, and vitamin K.[5]

The implementation of ECEB has been shown to improve the confidence, knowledge, and skill of health workers related to newborn care in resource limited settings.[6] Studies showed newborn care trainings significantly reduce neonatal mortality and still birth rates.[7] More specifically, evaluation of the ECEB training program showed that it has improved the health providers' knowledge significantly from pre-test to post-test.[6] Health care providers knowledge on ECEB is significantly influenced by the type of health cadres and type of health facilities where they work.[8-13]

The ECEB training along with HBB has been given in Southern Nations Nationalities and Peoples' Regional State (SNNPR) since 2018. However, the cognitive outcome of the training was not yet investigated. The objectives of this study were to evaluate the knowledge outcome of the training and to characterize it with respect to sex, education level, profession, and type of health facilities where the trainees in SNNPR, Ethiopia. The finding of this study may serve as a baseline for further studies. It may also be helpful for policy makers and programmers to consider redesigning of the program.

Methods

Study Setting and Area

The study was conducted in the 2 training centers in SNNPR, Ethiopia. The centers of training were Mizan-Tepi University Teaching Hospital and Sawula General Hospital which are 585 and 514 km away from Addis Ababa respectively. These 2 centers are the only centers of HBB and ECEB training in SNNPR selected by the programmers.

Study Design

A pre- and post-test study was conducted to examine the knowledge outcome of ECEB training. We used secondary data of the ECEB training given for health professionals from August/2018 to 2019.

Study Population

All trainees of ECEB training who fulfilled the inclusion criteria

Inclusion and Exclusion Criteria

All ECEB trainees who completed the training and had both pre-test and post-test results were included.

Sample Size

All the ECEB trainees (98 trainees) comprised of Nurses, Midwives, Health officers, and Anesthetists were included.

Trainees and a Course Structure

The training was given by grouping trainees into 5 subgroups with maximum of 20 trainees. The ECEB training was given for 2 days. It is as a part of HBB and ECEB training program. The training started with familiarizing the trainees to the different training materials including trainees' action plan, ECEB Flip chart, ECEB Provider guide, Mama Breast Simulators, and other materials for simulation and demonstration.[5] Then, pre-test was given to check the knowledge of trainees using 25 standardized multiple choice questions. The test was AAP's previously validated ECEB knowledge assessment tool.[14] Upon completion of the training, post-test was provided by using similar test applied during the pre-test.

Study Variables

Dependent and independent variables. Knowledge outcome(Knowledge of trainees (pre- and post-test results))of the ECEB training was the outcome variable while, sex, education level, profession, type of health facility of the trainees were explanatory variables.

Data collection procedure. The data used for this study was obtained from the reporting documents of the ECEB training deposited at Mizan-Tepi University Educational Development Center (EDC) responsible for coordinating the training. All trainees' profile comprising variables of interest including their knowledge (pre- and post-test) is available at the EDC. These data extraction checklist used was included as supplementary file (Supplemental File 1).

Data analysis. The extracted data were entered into Epi-info7 and imported to SPSS version 21 for analysis. Descriptive statistics (mean, standard deviation) were computed for both pre-test and post-test. The paired sample T-test was used to compare the mean difference between pre-test and post-test. An independent sample t-test was used to observe differences in the mean score of knowledge with respect to sex, education level, and type of health facility. One way Anova with a post hoc test was used to check differences in the mean score of knowledge among different professions. The statistical significance was determined at P-value $<.05$.

Results

Background Characteristics of Trainees

More than 2 folds (67.3%) of the trainees were females. The majority (86.7%) of the trainees were nurses and midwives while anesthetists accounted for the smallest proportion (4.1%) of the trainees (Table 1).

Knowledge Outcome of ECEB Training

According to paired Sample *T*-test, the overall mean (standard deviation) knowledge score of the trainees increased from 59.10 (SD $\pm$ 13.180) before the training to 73.73(SD $\pm$ 14.173) after the training. This difference was statistically significant; (t (97) = 11.684, CI = 12.147-17.118, $P < .001$) (Supplemental File 2ab).

Regarding the mean knowledge score variation in relation to other variables, the trainees' mean knowledge score significantly varied between the types of health facilities of the trainees at post-test. Similarly, a significant mean knowledge score difference observed between sexes of the trainees both at pre and post-test (Table 2).

The trainees' mean knowledge score showed a significant difference between male and female both at pre-test; t (96) = 2.424, $P = .017$ and post-test; t (96) = 2.944, $P = .004$. There was also a significant mean knowledge score difference between trainees from hospitals and health centers at post-test; t (96) = 2.403, $P = .018$ (Table 3).

One way Anova with a post hoc test did not show any significant difference in mean knowledge score of the trainees between different professions at both pre-test and post-test ($P > .05$) (Table 4).

Discussion

Assessing the trainees' knowledge after ECEB training is very important because knowledge is significantly correlated with skill of the trainees.[15,16]

As evidenced in this study, the mean knowledge score of the trainees was significantly increased immediately after the training. This finding is consistent with study findings in resource limited settings.[6,11] However, the mean knowledge score was not increased uniformly among trainees and significantly varied by sex and type of health facility. Male showed a higher mean score both at the pre- and post-test than female. This may indicate that ECEB training alone couldn't narrow the knowledge gap between male and female. Though the reason behind it may deserve another study, programmers and stakeholders may consider the sex difference while arranging the ECEB training to deliver more intensified training for female trainees.

Table 1. Background Characteristics of Trainees in Southern Nations, Nationalities and Peoples' Region, Ethiopia, 2018-2019.

Variables		Frequency	%
Sex	Male	32	32.7
	Female	66	67.3
Health facility	Hospital	47	48.0
	Health center	51	52.0
Education level	Degree	60	61.2
	Diploma	38	38.8
Profession	Nurses	30	30.6
	Midwives	55	56.1
	Health officers	9	9.2
	Anesthetists	4	4.1

Table 2. Trainees' Mean Knowledge Score in Relation to Sex, Education Level, Health Facility, and Profession of Trainees in Southern Nations, Nationalities, and Peoples' Region, Ethiopia, 2018-2019.

Variables			Mean	SD
Sex	Male	Pre-test	63.63	13.607
		Post-test	79.56	13.322
	Female	Pre-test	56.91	12.488
		Post-test	70.91	13.795
Health facility	Hospital	Pre-test	61.28	13.085
		Post-test	77.23	11.895
	Health center	Pre-test	57.1	13.074
		Post-test	70.51	15.408
Education level	Degree	Pre-test	59.73	13.893
		Post-test	74.63	15.158
	Diploma	Pre-test	58.11	12.08
		Post-test	72.32	12.525
Profession	Nurses	Pre-test	60	13.12
		Post-test	76	11.838
	Midwives	Pre-test	58.11	12.385
		Post-test	70.98	14.792
	Health officer	Pre-test	60	19.9
		Post-test	80	17.321
	Anesthetists	Pre-test	64	8.641
		Post-test	80.5	5.745

Trainees who came from hospitals achieved higher pre-test and post-test score though this was statistically significant only at post-test. It is obvious that hospitals are more equipped and have a large number of deliveries. This may have created opportunities for health workers to know more about ECEB. Previous studies revealed that knowledge score was significantly higher among health care providers working at well-equipped facilities.[17] Similarly, knowledge score was significantly higher among health care providers working at

Table 3. Trainees' Mean Knowledge Score Difference in Relation to Sex, Education Level, Health Facility of Trainees in Southern Nations, Nationalities, and People's Region, Ethiopia, 2018-2019.

Variables		*t*	*df*	Sig. (2 tailed)	MD	CI	
Sex	Pre-test	2.424	96	0.017	6.716	1.217	12.215
	Post-test	2.944	96	0.004	8.653	2.819	14.487
Health facility	Pre-test	1.580	96	0.117	4.179	−1.071	9.428
	Post-test	2.403	96	0.018	6.724	1.171	12.278
Education level	Pre-test	.594	96	0.554	1.628	−3.814	7.070
	Post-test	0.787	96	0.433	2.318	−3.527	8.162

Abbreviations: CI, confidence interval; *df*, degree of freedom; MD, mean difference.

Table 4. Trainees' Mean Knowledge Score Difference in Relation to Profession of Trainees in Southern Nations, Nationalities and Peoples' Region, Ethiopia, 2018-2019.

DV		Profession	MD	Sig.	CI	
Pre-test	Nurse	Midwife	1.891	.924	−6.01	9.8
		Health officer	0	1.000	−13.24	13.24
		Anesthesia	−4	.942	−22.54	14.54
	Midwife	Nurse	−1.891	.924	−9.8	6.01
		Health officer	−1.891	.979	−14.41	10.63
		Anesthesia	−5.891	.828	−23.93	12.15
	Health officer	Nurse	0	1.000	−13.24	13.24
		Midwife	1.891	.979	−10.63	14.41
		Anesthesia	−4	.959	−24.93	16.93
	Anesthesia	Nurse	4	.942	−14.54	22.54
		Midwife	5.891	.828	−12.15	23.93
		Health officer	4	.959	−16.93	24.93
Post-test	Nurse	Midwife	5.018	.394	−3.28	13.32
		Health officer	−4	.875	−17.9	9.9
		Anesthesia	−4.5	.930	−23.97	14.97
	Midwife	Nurse	−5.018	.394	−13.32	3.28
		Health officer	−9.018	.283	−22.17	4.13
		Anesthesia	−9.518	.556	−28.46	9.42
	Health officer	Nurse	4	.875	−9.9	17.9
		Midwife	9.018	.283	−4.13	22.17
		Anesthesia	−0.5	1.000	−22.48	21.48
	Anesthesia	Nurse	4.5	.930	−14.97	23.97
		Midwife	9.518	.556	−9.42	28.46
		Health officer	0.5	1.000	−21.48	22.48

Abbreviations: CI, confidence interval; DV, dependent variable; MD: mean difference.

facilities with large numbers of deliveries.[9,18] This may indicate that more intensive instructions or refresher trainings are needed for health care providers who work at health centers.

The mean knowledge score was not significantly varied with profession and education level both at pre-test and post-test. A relatively similar mean score of knowledge among different professions and education level may indicate that the ECEB training can be provided irrespective of trainees' education level and profession.

Strengths and Limitations of the Study

This study is the first one on the knowledge outcome of ECEB training on trainees' knowledge in SNNPR. It used a validated and standardized tool to assess the knowledge of ECEB trainees. The knowledge difference due to other variables like clinical experience, and previous related training were not assessed as these variables were not recorded in the reporting document of the

ECEB training. In this study, we evaluated the knowledge outcome of ECEB training immediately after the training. Therefore, future studies on the effect of ECEB training in the study area should focus on the long term effect of the training.

Conclusion

In general, overall knowledge outcome of trainees significantly improved after the ECEB training. In relation to specific variables, the knowledge outcome significantly increased only for male trainees both at pre- and post-test. Similarly, regarding facility type of trainees, the knowledge outcome significantly increased only for those who came from hospitals. Therefore, to further enhance female trainees and those who come from Health Centers, a separate training session with extra support should be arranged by programmers.

Ethical Approval Statement

A written permission letter was obtained from Mizan-Tepi University College of Health Sciences, Academic and Research Directorate with Ref No.: MTU/CHS/982/12. Accordingly we got permission from EDC Office to access data of ECEB trainings. Furthermore, no identifiable data were included both in dataset and in the manuscript. However, consent to participate was not applicable because we used secondary data.

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Data Sharing and Data Availability Statement

Data used for this manuscript is available from primary author at lalisachewaka@gmail.com on a reasonable request.

Supplemental Material

Supplemental material for this article is available online.

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