Research Article

Assessing Contraceptive Service Training Using the Kirkpatrick Model to Improve Health Worker Competency

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Abstract

Objective: To evaluate contraceptive service training using the Kirkpatrick evaluation model levels 1–3.

Methods: This quasi-experimental study was conducted based on the Kirkpatrick evaluation model to assess contraceptive service training in West Nusa Tenggara, Indonesia. Thirty health workers participated after providing informed consent. The competency-based training employed a blended learning approach, consisting of 57 hours of online theoretical instruction followed by 50 hours of face-to-face practical training. The training was evaluated at the reaction, learning, and behavior levels of the Kirkpatrick model. Participants were representatives from districts and municipalities across West Nusa Tenggara Province.

Results: Participants reported a high level of satisfaction with the training (86.89%). Knowledge levels improved significantly, with mean scores increasing from 56.33 on the pre-test to 95.73 on the post-test. During the training, participants demonstrated effective counseling skills as well as competency in IUD and implant insertion and removal. However, the mean competency scores showed a decline one year after the training.

Conclusion: The improvement in pre-test and post-test scores was statistically significant ($p < 0.001$). At the behavior level, a slight decrease in competency was observed after one year of follow-up.

Keywords: contraceptive services, contraceptive training, evaluation, health worker, kirkpatrick model.

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INTRODUCTION

The primary goal of health development is to achieve an optimal level of health for all segments of society. This goal encompasses a series of efforts and strategies aimed at improving overall community health. One of the key indicators used to measure the success of a country's health development is the Maternal Mortality Rate (MMR)[1]. A high MMR reflects unequal access to maternal health care services, inadequate health infrastructure, and socio-economic factors that disproportionately affect women. In Indonesia, the MMR in 2020 remained at 189 deaths per 100,000 live births[2], which is considerably higher than the Sustainable Development Goal (SDG) target of fewer than 70 deaths per 100,000 live births[3].

A long-term decline in maternal mortality in Indonesia has been associated with increased contraceptive use[4]. Contraceptive services play a crucial role in preventing unwanted, unplanned, and high-risk pregnancies, thereby contributing to reductions in maternal mortality[1,5]. These services are also essential in preventing pregnancy-related complications[6,7]. However, despite the greater effectiveness of modern contraceptive methods, many Indonesian women continue to rely on traditional methods[8]. This situation highlights the need to improve the quality of contraceptive services through the provision of care by competent health personnel.

Training for contraceptive service providers, particularly midwives in primary health care settings, plays a vital role in strengthening program management and enhancing service delivery. Such training is implemented using a blended learning approach that combines online theoretical instruction with offline, face-to-face practical sessions[9]. To ensure standardized service quality, the Ministry of Health, in collaboration with professional organizations, has developed a national training module that requires systematic evaluation. This evaluation should assess participants' understanding, the relevance and efficiency of the training modules, challenges encountered during implementation, and the benefits gained by the health workforce[10].

Several frameworks have been developed to evaluate the effectiveness of training and human resource development programs, one of which is the Kirkpatrick model. Developed by Donald L. Kirkpatrick, this evaluation framework consists of four sequential levels that provide a comprehensive assessment of a program's impact and effectiveness[11]. These levels include reaction, learning, behavior, and outcomes. Each level is interrelated, and positive results at levels one and two are expected to lead to behavioral change and improved outcomes at levels three and four[12].

Despite the importance of contraceptive service training, studies evaluating its effectiveness in Indonesia remain limited, particularly in West Nusa Tenggara. Therefore, this study aims to evaluate contraceptive service training using the Kirkpatrick model (levels 1–3) to assess improvements in health worker competency.

METHODS

This study employed a quasi-experimental design. Contraceptive service training was conducted in West Nusa Tenggara, Indonesia, in 2023. Data collection for Kirkpatrick model levels 1 and 2 was carried out using questionnaires included in the contraceptive service training module developed by the Indonesian Ministry of Health9. Data collection for Kirkpatrick model level 3 focused on assessing competencies in counseling, implant insertion, implant removal, intrauterine device (IUD) insertion, and IUD removal. These assessments were conducted during the training and repeated one year after the training.

Participants were required to perform two-rod implant insertion and removal procedures, as well as IUD insertion and removal, using mannequins. Each procedure was directly observed and evaluated by a trained facilitator using a standardized checklist. Counseling competency was assessed through structured role-play scenarios. All participants completed the full set of competency assessments.

Data analysis was performed using SPSS software. Participants' satisfaction scores were calculated and presented as mean percentages. Knowledge scores and behavior-level competency data were first tested for normality. Paired t-tests were applied to normally distributed data, while Wilcoxon signed-rank tests were used for non-normally distributed data to compare pre-test and post-test scores.

RESULTS

The research participants were health workers in West Nusa Tenggara Province, consisting of 30 midwives, all female (100%). Participants were categorized into three age groups: 21–30, 31–40, and 41–50 years. The largest age group was 31–40 years, comprising 63.3% of participants. Most participants held a D3-level midwifery qualification (73.3%), while the remaining 26.7% had completed D4/S1 midwifery education. In terms of religion, 93.3% were Muslim.

Table 1. Characteristics of Research Subjects

Variables	N (%)
Age (years)	
20-30	2 (6.7)
30-40	19 (63.3)
40-50	9 (30.0)
Education	
D3	22 (73.3)
D4/S1	8 (26.7)
Religion	
Hindu	2 (6.7)
Islam	28 (93.3)
Length of employment (years)	
0-5	5 (16.66)
>5-10	1 (3.33)
>10-15	5 (16.66)
>15	19 (63.33)

Participants were selected from all districts and municipalities in West Nusa Tenggara Province, with three midwives representing each area.

Level 1 Kirkpatrick

The results showed that the subject's

satisfaction was excellent, with an average score index of 87.44% very good, 12.15% good, and 0.39% moderate. The highest points in the excellent value are related to the subject's experience in conducting contraceptive training learning in class and also the enthusiasm in the subject to learn in class. The good points that need to be considered are providing training aids in the classroom as it reaches 30%. Meanwhile, this study found that there were still moderate scores on two questions, with a percentage of 3.33%.

Level 2 Kirkpatrick

Learning outcomes were assessed using pre-test and post-test scores. The mean pre-test score was 56.33, increasing to 95.73 on the post-test. This improvement was statistically significant ($p < 0.001$), indicating improvement about contraceptive knowledge following the training.

Table 2. T-test of the Value of Knowledge of Contraceptive Services pre and post-test

Knowledge	Mean ± SD	Δ Mean	*P-value* Paired T-test
Pre-test	56.3333 ± 10.37349	39.4	0.000
Post-test	95.7333 ± 3.59054		

Level 3 Kirkpatrick

Competency assessments were conducted during the training and followed up one year later. The competencies evaluated were counseling, IUD insertion, IUD removal, implant insertion, and implant removal. During the training, all competencies achieved a mean score of 100. One year after training, mean scores declined across all skills, with the largest decrease observed in counseling skills (mean 90.26). Decreases in procedural skills were smaller but remained statistically significant. Some steps that were frequently missed during counseling included offering condoms for dual protection and using contraceptive decision aids. During IUD insertion, the internal examination step was commonly neglected. For implant procedures, maintaining sterile technique was often disregarded.

Table 3. Differential Test of Trainees' Competence after 1 Year

Competence	Mean ± SD	Δ Mean	*P-value* Paired T-test
Counseling			
during training	100.00 ± 0.00	9.73	0.000
One year after training	90.26+12.49		
IUD insertion			
during training	100.0 ± 0.00	8.33	0.000
One year after training	91.66 + 6.81		
IUD removal			
during training	100.00 ± 00.00	2.20	0.000
One year after training	97.80 ± 2.64		
Implant Insertion			
during training	100.00+0.00	3.50	0.003
one year after training	96.50 ± 6.01		
Implant Removal			
during training	100.00±0.00	1.93	0.049
one year after training	98.06±5.15		

DISCUSSION

This study evaluated the outcomes of contraceptive training in West Nusa Tenggara Province. The findings showed that the intervention improved healthcare workers' knowledge and skills, although some service delivery challenges remained.

Level 1 Kirkpatrick

At Level 1, participants' reactions were assessed through satisfaction scores covering classroom learning, online learning, and accommodation. All three components received overall "very good" ratings, indicating high participant satisfaction. Previous research similarly reported high satisfaction with training methods, in which 60 of 65 participants rated the learning activities effective (92.3%).[13] In this study, classroom and online learning both achieved excellent satisfaction levels, with mean scores of 83.33%. These findings are consistent with studies in Thailand and Tehran, found significant differences in satisfaction between classroom and online learning, influenced by teachers, families, learners, and environmental factors[13]. In this study, classroom and online learning both achieved excellent satisfaction levels, with mean scores of 83.33%. These findings are consistent with studies in Thailand and Tehran, found significant differences in satisfaction between classroom and online learning, influenced by teachers, families, learners, and environmental factors[14–17].

Learning satisfaction is known to be influenced by teacher-related, learner-related, and institutional factors[18]. Positive teacher–participant interactions, adequate learning materials, and supportive environments contributed meaningfully to satisfaction levels in this study. Participants also expressed satisfaction with accommodation components such as administrative support, facilities, and consumption provided during the training, reflecting the importance of environmental comfort in the learning experience[15]. The Level 1 findings can serve as feedback for training organizers to maintain strong learning environments and address areas requiring improvement.

Level 2 Kirkpatrick

Level 2 evaluated knowledge achievement. The significant increase in mean scores from pre-test to post-test ($p < 0.05$) demonstrated an improvement of 39.4 points, indicating enhanced participants' understanding of contraceptive services. Previous research has shown that insufficient contraceptive knowledge can hinder healthcare workers' ability to provide optimal services[19]. Findings from 28 of 31 independent learning interventions reported significant positive impacts on knowledge, including understanding of method use, benefits, risks, and effectiveness[20]. Similar evaluations among health workers have also shown improvements in knowledge and behavioural indicators after training [21].

Training has been shown to enhance learning, strengthen motivation, and improve the performance of healthcare workers in service delivery [21,22]. A European study involving 21 countries reported that although all health cadres were involved in contraceptive service provision, pre-service education was considered insufficient in most settings, highlighting the need for ongoing professional development[23]. The significant knowledge gains found in this study are consistent with these findings.

Level 3 Kirkpatrick

Improvements in knowledge were expected to translate into better competencies. During the intervention, participants achieved perfect mean scores (100) on competencies including counseling, IUD insertion and removal, and implant insertion and removal. However, reassessment one year later showed significant declines across all competencies. Counseling experienced the largest decrease, followed by IUD insertion, IUD removal, implant insertion, and implant removal.

Studies have shown that competency retention is influenced by factors such as confidence, frequency of performing procedures, comfort levels, type of training, and the length of time since training [24]. The decline observed in this study may reflect variations in workplace practice patterns, limited procedural exposure, and the absence of supervision or reinforcement over time. Providers also reported that contraceptive service delivery is affected by organizational structures, individual provider factors, policies, and environmental influences[25]. Lack of experience and limited confidence in counseling or technical procedures have similarly been noted as barriers in other settings[25].

To maintain participants' competencies, periodic post-training evaluations, supervision, and scheduled refresher sessions are essential. Regular reinforcement can help participants retain procedural accuracy, adhere to the checklist, and maintain high-quality contraceptive service delivery.

Overall, evaluation of contraceptive training in West Nusa Tenggara using the Kirkpatrick model showed high participant satisfaction

and significant knowledge gains (Level 1–2). However, the notable decline in competency within one year (Level 3) highlights the need for sustained professional development, structured supervision, and periodic refresher training to ensure long-term quality in contraceptive service provision.

CONCLUSIONS

This study demonstrated that in-service training on contraceptive services was effective in improving participants' satisfaction, knowledge, and competencies, as assessed using the first three levels of the Kirkpatrick model. However, a slight decline in competency scores was observed at the behavior level one year after the training, indicating challenges in maintaining long-term performance. These findings underscore the importance of implementing continuous support measures to help sustain participants' skills. Periodic evaluations several months after training, ongoing supervision, and refresher sessions related to previously delivered materials are recommended to ensure that competencies remain aligned with standards. Future research should explore long-term strategies that can strengthen the sustainability of contraceptive service delivery.

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CONFLICT of INTEREST

The author declares no potential conflict of interest

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