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Leveraging Delphi Technique to Develop Breastfeeding Support Modules in East Java, Indonesia

Mellysa Kowara[1]✉, Dinar Saurmauli Lubis[1], Yessi Crosita[2], Betty Octaviana[1], I Desak Ketut Dewi Satiawati Kurnianingsih[1], Pande Putu Januraga[1]
[1]Centre for Public Health Innovation, Faculty of Medicine, Udayana University, Bali, Indonesia
[2]Universitas Pembangunan Nasional (UPN) Veteran Jakarta, Indonesia

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Abstract

Improving knowledge and skills are crucial factors in increasing the commitment of health facility staff to support exclusive breastfeeding. This study presents the steps to formulate the modules using the Delphi technique and implement those modules in the training. This study used a mixed-methods method consisting of four stages: literature review, qualitative analysis, module validity, and module implementation. The modules were validated by 14 lactation experts to assess reliability, feasibility, and linguistics. The study was conducted from 2020-2021 in 5 regions in East Java Province. A pre-post-test measurement with 493 health workers and non-health workers was conducted to assess the effectiveness of the modules. The first round of Delphi showed agreement proportion between 80-100% on the three aspects. In the second round of Delphi, the strong consensus stated that the modules can be implemented in training was achieved with the percentage of feasibility (79.4%), reliability (44.4%), and linguistics (44.4%). The results of the training using the modules showed a significant improvement in knowledge between 6-26 points in 5 areas (p-value<0.000). In conclusion, three modules have been developed and validated successfully. The modules were effectively used to improve breastfeeding knowledge and practice among health and non-health workers.

Introduction

Malnutrition in those under five remains a major health problem in Indonesia and even the figure rose during Pandemic COVIDS-19 due to a decrease in financial power (Ministry of Health of the Republic of Indonesia [Moh], 2018; Octavia and Rachmalina, 2022). Based on the Indonesian Nutritional Status Survey, the prevalence of stunting in 2021 was 24.4% with a decrease rate in stunting was 2% per year (Kementerian Kesehatan Republik Indonesia, 2021). The prevalence of stunting in Indonesia varies between regions where the malnutrition rate is 2.21 times higher in the Eastern Indonesia region (Papua, Maluku, and Nusa Tenggara Region) than in the Java and Bali region (Ayuningtyas et al., 2022). This is still far from the national target of stunting reduction, which is 14% in 2024, placing Indonesia in 108th place out of 132 countries in the world (Kementerian Kesehatan Republik Indonesia, 2021).

The exclusive breastfeeding practice is one of the main efforts to prevent stunting in 1000 days of first life (Campos, Vilar-Compte and Hawkins, 2020; Hadi et al., 2021). Based on research conducted in Indonesia, pointed out that exclusive breastfeeding for 6 months can reduce the incidence of stunting in poorer households by 20% and reduce the incidence of stunting by 50% in households with better economic levels (Hadi et al., 2021). However, the coverage of exclusive breastfeeding in Indonesia is still low where the figure has decreased from 38% in 2013 to 37.2% in 2018.

✉ Correspondence Address:
Jl. Raya Kampus UNUD, Bukit Jimbaran, Kuta Selatan, Badung, Bali 80361, Indonesia
Email: mellysa.kowara@gamail.com

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Meanwhile, the prevalence of the practice of Early Initiation of Breastfeeding (EIB) reached 58.2% in 2018 (Ministry of Health of the Republic of Indonesia, 2018). For such a large benefit of exclusive breastfeeding, the practice of breastfeeding needs to be improved (Quesada, Méndez and Martín-Gil, 2020).

To reduce children's morbidity and mortality, WHO recommends mothers breastfeed their babies within one hour after birth and exclusively until the baby is 6 months old (Gavine, McFadden, et al., 2017). Initiation of breastfeeding immediately after birth will increase the chances of successful exclusive breastfeeding practice (Yılmaz et al., 2017; Walsh et al., 2019). To support this recommendation, the breastfeeding practice must be supported by health workers and protected by policies starting from health facilities (Nyondo-Mipando et al., 2021). As a critical place to initiate breastfeeding, health facilities should support mothers to conduct breastfeeding to elevate the chance to achieve 6-months of exclusive breastfeeding and breastfeeding up to two years (Woldeamanuel, 2020; Akello et al., 2021). In the 10 Steps to Breastfeeding Success (10 STSB) initiative launched by WHO, it is stated that to support breastfeeding practices in health facilities, key critical management stages including breastfeeding policies and breastfeeding support training for health facility workers must be carried out to achieve the success of other steps (Gavine, McFadden, et al., 2017; Agampodi et al., 2021).

To support the 10 STSB implementations, the Global Alliance for Improved Nutrition (GAIN) as a National NGO that focuses on improving nutrition has appointed the Centre for Public Health Innovation (CPHI) to conduct an initial assessment of 10 STSB implementations in 242 health facilities in five regions (Bondowoso, Jember, Probolinggo, Trenggalek and Surabaya City) in East Java in 2019. One of the major findings is breastfeeding training was rarely conducted in health facilities due to many reasons. Whereas, as a critical step that must be implemented, breastfeeding support training for health facility workers is a crucial step to improve Early initiation of breastfeeding practice, extend the duration of breastfeeding, and increase mother's trust in health workers (Kowara, 2021).

Many factors were the cause of that issue. Based on the initial study results it was found that the low number of health workers who had attended certified breastfeeding training was because of the high cost to include health workers in the training. Besides that, health facilities also had limited funds to conduct training independently at the health facility level (Pramono et al., 2022). In addition, certified training takes 5 working days so it is difficult for health facilities to allocate funds and time for its health workers to participate in the training. These obstacles have an impact on the lack of commitment of health workers in health facilities to support exclusive breastfeeding for mothers giving birth (Gavine, MacGillivray, et al., 2017). To answer those needs, modified breastfeeding support training has been developed to improve the knowledge and skills of the health non-health workers in health facilities. This article will present step by step to formulate the modules using the Delphi technique and implement those modules in the breastfeeding training in five districts in East Java.

Methods

This is a mixed-methods study which was divided into four stages, namely qualitative study, literature review, module validity, and module implementation. Respondents from this study were health workers and non-health workers in health facilities in 5 districts/cities (Bondowoso, Jember, Probolinggo, Trenggalek, and Surabaya). The study was conducted from 2020-2021. The developed module was adapted based on the 40-hour Breastfeeding Counsellor Module launched by WHO. In the newly developed breastfeeding support module, the material was shortened into 12 sessions with the duration of each session being 1 hour of training. The development stages of the modules were initial study, module writing, formulation of Delphi instruments, module validation using Delphi techniques, and module implementation in training.

The initial study was done to create a module syllabus that accommodate the knowledge needs of health workers and non-health workers. A qualitative study was

conducted with the involvement of lactation experts, and maternity, and health promotion staff. This step aimed to explore knowledge gaps so that an appropriate curriculum could be formulated in the new module. In addition, a literature review was also carried out to enrich the breastfeeding theory support module. The output of this initial stage was to produce a syllabus that outlines the knowledge and practice material sessions needed by health and non-health workers.

The process of writing module material refers to the developed syllabus during the initial study stage. The three modules on breastfeeding support applied for health workers, non-health workers, and breastfeeding champions were compiled based on published literature. Three module drafts were consulted with lactation experts, internationally certified breastfeeding counsellors, and nutritionists to get initial input that was leveraged to improve module quality. The 3 modules developed are presented in Table 1.

The module assessment aspect was developed based on quality indicators, namely reliability and feasibility. This indicator has been widely used to measure the quality of health program implementation (Blas et al., 2016). In addition to those two indicators, linguistics assessment was added. The aspects details of the module assessment are as follows:

1) Reliability: assessment aspect to measure validity and consistency of breastfeeding concepts in the developed modules.
2) Feasibility: assessment aspect to measure the possibility level of breastfeeding theory implementation in the developed modules.
3) Linguistics: assessment aspect to assess the suitability of grammar, sentence structure, and comprehension level of breastfeeding concepts.

The Delphi questionnaire was developed online using a Likert scale, namely "Strongly Disagree", "Disagree", "Agree" and "Strongly Agree". Columns were also provided to write qualitative input in each chapter.

Module validation was carried out using a Delphi survey where this method was proven to be able to measure reliably in developing new concepts and determining future program directions (Chianchana, 2022). There were two rounds of Delphi survey which was conducted during March-April 2020. There were 14 lactation experts as validators such as a breastfeeding counselor from the District Health Office of East Java Province an International Certified Breastfeeding Counsellor, a representative of the midwives' association, an obstetrician, midwives, and a nutritionist. The entire validation process was conducted in several stages, namely:

1) Modules and Online Questionnaire Distribution

The distribution of modules and questionnaires was done one week before the open discussion. The lactation experts received 3 breastfeeding modules and 3 Delphi questionnaire packages that had to be filled out. The results of the data obtained in the questionnaire were analyzed using SPSS and presented at an open discussion meeting.

2) Open Discussion

In this process, results from the Delphi survey were presented to all lactation experts. The open discussion took place in 2 rounds where the first round focused more on exploring inputs and improving the quality of the module while the second round prioritized drawing consensus from lactation experts. A whole discussion process was recorded with informed consent in advance.

3) Drawing Consensus

Consensus was made from agreement among lactation experts. The interpretation of each session assessed was "Strong Consensus" if scores indicated ≥95% agreement in each material session, "Consensus" was reached if 80-94% of lactation experts demonstrated an agreement response, and "No Consensus" was defined if scores indicated <80% agreement. For written mutual agreement, all lactation experts signed the approval agenda which stated the modules passed the three assessment aspects.

After the modules were validated, training was conducted in 493 health facilities and health offices in East Java Province, which are spread across 5 districts/cities, namely Bondowoso, Jember, Probolinggo, Trenggalek, and Surabaya. The number of training

Table 1. Breastfeeding Support Curriculum Modules for Health and Non-Health Workers

Cover	Module Title	Materi Modul	Duration	Participants
	Primary Promotion of Breastfeeding Module for Non-Health Workers in Health Facilities ISBN No. 978 602 294 433 1	Session 1: The Role of Health Promotion Profession in Supporting the 10 STSB and Exclusive Breastfeeding Programs Session 2: Communication Strategy for Non-Health Workers to Promote 10 STSB and Exclusive Breastfeeding Practice Session 3: The Importance of Breast Milk and Breastfeeding Session 4: Basic Knowledge of Breastfeeding Techniques and How to Help Mothers to Breastfeed Session 5: Basic Assistance Practices for Breastfeeding Mothers Session 6: Common Breastfeeding Issues and Providing Basic Referral Information Session 7: Advantages of Breast Milk Compared to Formula Milk Session 8: Emo-Demo Techniques to Support Exclusive Breastfeeding	8 Hours	Health workers and non-health workers such as administrators, customer service, security, cleaning service, etc.
	Management and Breastfeeding Counselling Modules in Health Facilities ISBN No. 978 602 294 432 4	Session 1: The Importance of Breast Milk and Breastfeeding Session 2: Communication Strategies to Improve Mother's confidence to breastfeed Session 3: Emo-Demo Technique to support Exclusive Breastfeeding. Session 4: Exclusive Breastfeeding Education during ANC Session 5: Early Initiation of Breastfeeding Session 6: Latching and Position during Breastfeeding Session 7: Helping mothers in positioning and latching while breastfeeding (Practice Session) Session 8: Signs of Effective Breastfeeding Session 9-10: Common Breastfeeding Problems and Management. Session 11: Alternative Methods of Milking, Giving, and Storing Breastmilk Session 12: Alternative Method of Breastmilk Feeding (Practice Session)	12 Hours	Health workers such as midwives, maternity and child nurses, nursery nurses, nutritionists, health promotion, etc.
	TOT Breastfeeding Champion ISBN No. 978 602 294 444 7	Session 1: Welcome Session Session 2: Becoming a Good Trainer and Classroom Management Session 3: Teaching Skill Techniques Session 4: Theory and Practice of Communication Strategies for Exclusive Breastfeeding Promotion Session 5: Theory and Practice of Emotional Demonstration (Emo-Demo) to support Exclusive Breastfeeding Session 6: Theory and Practice in Positioning and Latching Session 7: Theory and Practice to Help and Observe Early Initiation of Breastfeeding. Session 8: Theory and Practice Common Breastfeeding Problems and Management	8 Hours	Health workers such as midwives, maternity and child nurses, nursery nurses, nutritionists, health promotion, etc.

participants was 493 people of maternal-child nurses, midwives, and health promotion officers. Participants' knowledge was measured before and after the training to find out whether there was a significant knowledge enhancement. Pre and post-test data were analyzed statistically by considering normality data. The different value in knowledge was classified as significant if p-value <0.05.

Results and Discussion

The module development process needs to be done rigorously and conducted in several stages to fulfill the knowledge gap of breastfeeding theory and practice for health and non-health workers (Cianelli et al., 2014). All module development activities involved certified lactation experts in adapting breastfeeding materials from various breastfeeding literature. Thus, these modules showed implications in increasing the knowledge of health and non-health workers regarding breastfeeding support in health facilities. The final stage was the validation process to assess whether the reliability, feasibility, and grammar of the breastfeeding-support interventions were following the science (Alberdi et al., 2018). In the first round of Delphi, all lactation experts provided assessments regarding three aspects of the module, namely reliability, feasibility, and linguistics. In this module, eight material sessions must be assessed by lactation experts. The results of the Delphi Survey on the module Basic Promotion of Breastfeeding for Non-Health Workers in Health Facility are presented in the Table 2.

From the Delphi survey process, it was found that of the 3 modules assessed based on the three assessment aspects, scores were interpreted in the range of "Consensus" and "Strong Consensus" in each session and there was no interpretation of "No Consensus". From the reliability aspect, the lactation experts agreed on the theoretical truth level from breastfeeding concepts and practices developed in modules with a score range between 80-100. It is crucial to develop modules with standardized theoretical concepts so that all staff in the health facility have the same level of knowledge. Thus, the information that has been given to the breastfeeding mothers will be standardized and minimize discomfiture (Mulcahy et al., 2022).

Another assessed aspect was feasibility, which was an assessment related to the possibility of implementing the concept of breastfeeding into practice. The score obtained for the feasibility aspect was in the range of 90-

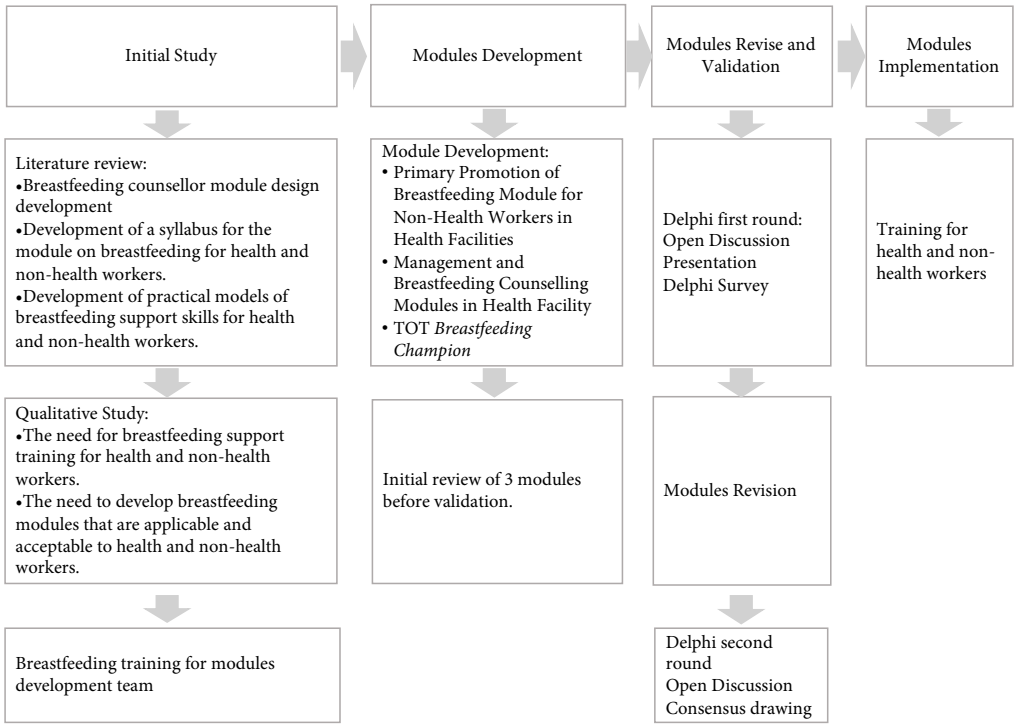

Figure 1. Flowchart of Breastfeeding Modules Development

Table 2. Delphi Survey Results on Three Breastfeeding Support Modules

Module	Session	Reliability		Feasibility		Linguistics		Total Skor
		Agreement proportion	Interpretation	Agreement Proportion	Interpretation	Agreement Proportion	Interpretation	
Primary Promotion of Breastfeeding Module for Non-Health Workers in Health Facilities	Session 1: The Role of Health Promotion Profession in Supporting the 10 STSB and Exclusive Breastfeeding Programs	84.62	Consensus	92.31	Consensus	100	Strong Consensus	133
	Session 2: Communication Strategy for Non-Health Workers to Promote 10 STSB and Exclusive Breastfeeding Practice	84.62	Consensus	92.31	Consensus	84.62	Consensus	126
	Session 3: The Importance of Breast Milk and Breastfeeding	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	142
	Session 4: Basic Knowledge of Breastfeeding Techniques and How to Help Mothers to Breastfeed	100	Strong Consensus	92.31	Consensus	92.31	Consensus	142
	Session 5: Basic Assistance Practices for Breastfeeding Mothers	92.31	Consensus	100	Strong Consensus	84.62	Consensus	139
	Session 6: Common Breastfeeding Issues and Providing Basic Referral Information	84.62	Consensus	92.31	Consensus	100	Strong Consensus	132
	Session 7: Advantages of Breast Milk Compared to Formula Milk	100	Strong Consensus	100	Strong Consensus	92.31	Consensus	149
	Session 8: Emo-Demo Techniques to Support Exclusive Breastfeeding	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	144
Management and Breastfeeding Counselling Modules in Health Facilities	Session 1: The Importance of Breast Milk and Breastfeeding	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	140
	Session 2: Communication Strategies to Improve Mother's confidence to breastfeed	100	Strong Consensus	100	Strong Consensus	92.31	Consensus	142
	Session 3: Emo-Demo Technique to support Exclusive Breastfeeding.	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	135
	Session 4: Exclusive Breastfeeding Education during ANC	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	144

	Session 5: Early Initiation of Breastfeeding	100	Strong Consensus	100	Strong Consensus	92.31	Consensus	139
	Session 6: Latching and Position during Breastfeeding	92.31	Consensus	100	Strong Consensus	92.31	Consensus	142
	Session 7: Helping mothers in positioning and latching while breastfeeding (Practice Session)	84.62	Consensus	92.31	Consensus	92.31	Consensus	131
	Session 8: Signs of Effective Breastfeeding	92.31	Consensus	92.31	Consensus	92.31	Consensus	135
	Session 9-10: Common Breastfeeding Problems and Management.	92.31	Consensus	92.31	Consensus	92.31	Consensus	127
	Session 11: Alternative Methods of Milking, Giving, and Storing Breastmilk	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	138
	Session 12: Alternative Method of Breastmilk Feeding (Practice Session)	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	141
TOT Breastfeeding Champion	Session 1. Welcome Session	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	135
	Session 2: Becoming a Good Trainer and Classroom Management	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	142
	Session 3: Teaching Skill Techniques	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	144
	Session 4: Theory and Practice of Communication Strategies for Exclusive Breastfeeding Promotion	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	149
	Session 5: Theory and Practice of Emotional Demonstration (Emo-Demo) to Support Exclusive Breastfeeding	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	147
	Session 6: Theory and Practice in Positioning and Latching	100	Strong Consensus	100	Strong Consensus	100	Strong Consensus	144
	Session 7: Theory and Practice to Help and Observe Early Initiation of Breastfeeding	92.31	Consensus	100	Strong Consensus	100	Strong Consensus	141
	Session 8: Theory and Practice Common Breastfeeding Problems and Management	92.31	Consensus	92.31	Consensus	92.31	Consensus	144

100. This score was quite high and indicated agreement among lactation experts that the concepts of breastfeeding in both theoretical and practice modules were feasible to be applied to health facility staff. It was important to assess the feasibility of a concept or program before it was implemented to ensure it was able to increase the knowledge and practice of health facility staff to support breastfeeding mothers (Lok et al., 2021).

Linguistics was the last criterion to be assessed in the breastfeeding modules. It was an additional aspect that had been agreed to be assessed by a lactation expert. The underlying reason was an urgent need to perform modules with non-complex terms, good grammar, and sentence structure. Thus, health facility staff could understand the theory, concept, and practice guidelines comprehensively. Particularly, if there were words that needed to be translated from the foreign language into Bahasa Indonesia (Wambach, 2018). Moreover, there were still parties who thought breastfeeding was an inappropriate practice so it requires consideration of language (Mahurin, 2015). From the first round Delphi survey, the linguistics aspect got a score with a range between 80 to 100.

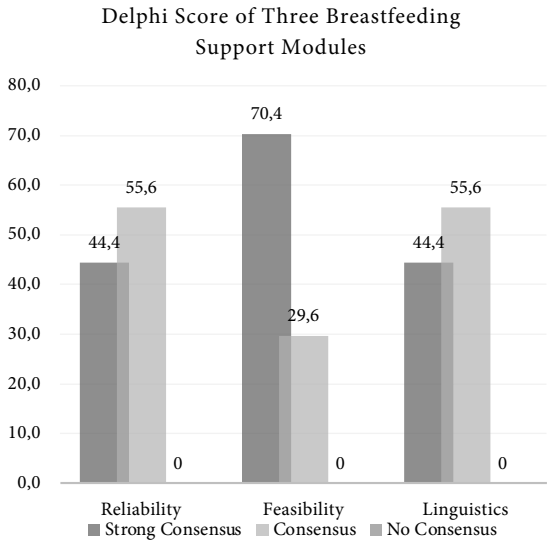

Figure 2. Interpretation of Score Proportions for the Three Breastfeeding Support Modules

The second round of Delphi was held about 2 weeks after the first round. The activity was conducted online by inviting lactation experts. In this forum, discussions were held up to the withdrawal of the consensus modules breastfeeding with an assessment of three aspects. The discussion took place quite intensely until the collective agreement was withdrawn. Based on the results of the Delphi second round, it was found that as many as 44.4% of lactation experts stated a strong consensus on the theoretical truth level from the breastfeeding concepts developed in the modules. This aspect was crucial to be assessed to minimize conceptual error. Thus, the breastfeeding theories that were written in the modules were correct and followed the updated concept (Dolgun et al., 2018).

The second aspect that agreed was feasibility which none of the lactation experts disagreed with the level of implementation of the breastfeeding theories in the modules. All experts agreed on the high possibility of implementing modules to increase knowledge and practice of breastfeeding by considering the characteristics of the target audience (Alberdi et al., 2018). The third aspect agreed upon by lactation experts was linguistics on grammar and the level of understanding possibility of sentences written in breastfeeding theory. The results of the linguistics assessment in the Delphi survey showed that 100% of lactation experts stated strong consensus and consensus on grammatical aspects.

The leveraging of the Delphi survey in the material validation of the breastfeeding support module is an effective way to explore expert opinions and input to reach a consensus among all lactation experts. However, in its implementation which was hampered by the Pandemic of COVID-19, all of the module validation process was carried out entirely online. The online Delphi survey also has a low level of acceptance among lactation experts. This can be seen only by 73.7% of lactation experts who are willing to be involved in this activity. The reason for the high refusal from experts to participate in the online Delphi survey was due to increased busyness during the Pandemic of COVID-19 and a lack of literacy in online technology. Delphi surveys also sometimes lead to pseudo-consensus, where during the discussion process, experts compromise more on the dominant opinion so that it does not

describe reaching a genuine agreement. An experienced moderator was required to manage the discussion room; thus all of the experts showed their opinions, gave some input, and minimized the risk of dominance in the process (Chianchana, 2022).

Implementation of module validation with Delphi which is conducted online needs to consider the readiness of using technology of lactation experts. Some experts were still not used to operating the Zoom meeting application because the validation process was carried out at the beginning of the COVID-19 Pandemic. In addition, the validation process conducted online needs to pay attention to the strength of the internet network and moderators' ability who were able to facilitate online discussion, thus it turns out to be more interactive among participants (Karl, Peluchette and Aghakhani, 2022). Another limitation was the long process of the validation so there was a risk that the expert would decide to resign halfway due to the tightness of their work (Kershaw et al., 2021). A written commitment was required when recruiting experts to follow the validation process until the end.

After the modules had passed the validation process, then it was implemented in breastfeeding training. The training was conducted in 493 health facilities with participants consisting of 326 maternity staff, 150 health promotion officers, and 17 people from the District Health Office. The number of participants who attended was 493 with a participation rate was 100%.

A differential test was conducted to measure the significance of the difference between the pre and post-test values of the training using three breastfeeding support modules. A paired t-test and Wilcoxon test were used in the analysis depending on the normality of the data. If the data is normally distributed, the Paired t-test was used, and if it is not normally distributed, the Wilcoxon test was used for the difference test. There was an increase in knowledge score with a range of 6-26 points in the three trainings. The significance value for three training in five districts showed a p-value<0.05, so it can be concluded that there were significant differences in knowledge before and after attending the training in 5 districts.

The result of the module implementation in the training revealed that the breastfeeding support module could significantly increase the knowledge of health and non-health workers in health facilities. Increasing knowledge had an effect on increasing attitudes and self-efficacy of health workers to perform support for breastfeeding mothers, which was a steppingstone to the Baby Friendly Hospital Designation (Dubik, Yirkyio and Ebenezer, 2021). Actions based on knowledge will be more consistent and sustainable than without sufficient knowledge support (Huang et al., 2019). Having sufficient knowledge related to breastfeeding support could be a strong foundation for health facilities to create a conducive atmosphere for breastfeeding. However, a strong knowledge needs to be

Table 3. Results of Pre-test and Post-test Score of Training Participants Using Three Breastfeeding Support Modules

Module	Intervention District	Pretest Score	Postest Score	P-Value
Primary Promotion of Breastfeeding Module for Non-Health Workers in Health Facilities	Bondowoso	78.8	88.9	0.000[a]
	Jember	71.2	83.0	0.000[a]
	Probolinggo	65.6	82.0	0.000[a]
	Trenggalek	76.8	89.0	0.000[a]
	Surabaya	74.2	83.0	0.000[a]
Management and Breastfeeding Counselling Modules in Health Facilities	Bondowoso	53.8	78.5	0.000[a]
	Jember	51.1	68.6	0.000[a]
	Probolinggo	52.8	69.7	0.000[a]
	Trenggalek	50.8	76.3	0.000[b]
	Surabaya	46.9	67.3	0.000[a]
TOT Breastfeeding Champion	Jawa Timur	75.4	85.7	0.000[a]

Note: [a] Wilcoxon Test; [b] Paired T-Test; α=0.05

maintained in terms of sustainability by monitoring and evaluating breastfeeding outcomes (Araújo et al., 2019).

Conclusion

The results of the Delphi study showed the feasibility of designing breastfeeding modules that were adapted based on the breastfeeding by WHO module. These modules can fill the knowledge and practice gap effectively required by health facility staff, with minimum cost and in a shorter time. Based on validation and implementation results, those modules passed the validation steps on reliability, feasibility, and linguistics aspects. Moreover, those modules also significantly improved health facility's staff knowledge in breastfeeding training conducted in East Java Province. With good performance, health facilities in Indonesia are expected to leverage those three modules in their internal training. So that it can educate more health and non-health workers who can support the breastfeeding initiation process in health facilities. Thus, the number of postpartum mothers who are willing to breastfeed their baby exclusively for 6 months will be increased.

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