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Effectiveness of Flipchart Media in Improving Mothers' Knowledge of Child Growth and Development in Lebak District, Indonesia

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This study aims to analyse the effectiveness of flipcharts compared to the KIA Book in improving mothers' knowledge of child growth and development at Posyandu clinics. The study employed a *mixed methods convergent* design using a quasi-experimental *pre-test-post-test two-group design* and in-depth interviews with health workers. Quantitative data were collected using a 20-item questionnaire on child growth and development knowledge from 18 mothers of toddlers, divided into a flipchart group and a KIA Book group, whilst qualitative data were obtained through semi-structured interviews. Data analysis utilised the Shapiro-Wilk test, the Wilcoxon Signed Rank Test, the *Independent Samples t-test*, *gain score analysis*, and ANCOVA, whilst effect sizes were reported using Cohen's *d* and the *standardised mean difference* (SMD). The results of the study showed that the flipchart group experienced a greater increase in knowledge compared to the MCH Book group, with a large effect size (Cohen's *d* = 1.06). Interview results indicated that health workers considered the flipchart to be more practical, communicative, user-friendly, and visually appealing compared to the KIA Book. The integration of quantitative and qualitative results suggests that the flipchart medium is more effective in supporting child growth and development education based on Posyandu in rural communities and has the potential to strengthen the implementation of Posyandu Reform through a more contextually appropriate health communication approach.

Keywords: Parent-Child Health Record, Maternal knowledge, Child growth, Development

INTRODUCTION

The toddler years are a golden period in a child's life, during which growth and development occur at a rapid pace and determine the quality of life in the future. According to the Indonesian Ministry of Health (2023), a child's successful growth and development are influenced by various factors, including nutrition, early stimulation, and appropriate parenting practices. However, various national surveys indicate that mothers' knowledge of child growth and development remains relatively low (Ofli & Yalçın, 2024). This situation has contributed to the persistently high prevalence of children with developmental delays and the risk of stunting in Indonesia (Astuti et al., 2022). One of the main obstacles to improving the knowledge of mothers of young children is the low effectiveness of health communication at community level. Until now, education on child growth and development has generally been delivered through conventional media such as the MCH (Maternal and Child Health) Booklet published by the Ministry of Health. The MCH Booklet serves as the primary guide for mothers in monitoring their children's health and development. However, a number of studies have revealed that the use of the MCH Booklet has not been optimal as an educational

tool (Oktavia & Mariyani, 2023). Many mothers simply use the booklet as a record of immunisations without reading the information inside in full (Sugiharti, R. K. (2024). These obstacles are caused by a number of factors, including a lack of interest in reading, the use of technical language that is difficult to understand, and a lack of visual appeal. An individual's ability to understand health information depends heavily on the format and method of communication. Media that is not suited to the target audience's literacy level will hinder the learning process (Nutbeam, 2000). Therefore, there is a need for innovative educational media capable of simplifying health messages, increasing emotional engagement, and facilitating two-way interaction between the provider and recipient of information. One form of media that meets these criteria is the Flip Chart.

The Flipchart is a visual aid containing colour illustrations and brief text, designed to support two-way communication between health workers and the community (Handayani et al., 2024). This medium has proven effective in educational activities as it allows the presenter to explain information step by step, capture the audience's attention, and give participants the opportunity to engage in active discussion (Mbanda et al., 2021).

Megawati et al. (2018) reported that the use of visual aids such as flipcharts can boost the motivation of community health workers and improve public understanding of maternal and child health.

From a learning theory perspective, the effectiveness of the Flip Chart can be explained by the Social Cognitive Learning theory developed by Albert (Heffernan, 1988). This theory asserts that the learning process occurs through observation and imitation of the models observed. In the context of health education, the images and illustrations presented in the Flip Chart serve as visual models that help individuals understand the concepts and expected healthy behaviours. Furthermore, Jerome S. Bruner, through his constructivist approach, explains that knowledge is not passively received, but actively constructed through the interaction between the individual and their learning environment and experiences. The Flipchart medium supports this process as it enables mothers to actively engage in discussions, interpret visual messages, and reflect on their health experiences during the educational process.

Furthermore, from the perspective of Paivio's Dual Coding theory (Paivio, 1990) The human brain processes information through two main systems: verbal and non-verbal (visual). Information presented simultaneously in the form of images and text is easier to understand and remember. Consequently, media such as Lembar Balik, which combines brief text with realistic visuals, can strengthen memory and improve information retention among mothers of toddlers.

From a health behaviour perspective, the effectiveness of educational media is also linked to the Health Belief Model (HBM), which explains that changes in health behaviour occur when individuals have a positive perception of the benefits of a health-related action and feel capable of carrying it out (Shakerinejad et al., 2023). The flipchart helps to increase the perception of benefits and reduce psychological barriers, as the messages conveyed are easy to understand, relevant and contextual to the daily lives of mothers of young children (Pranata, 2023).

In addition to cognitive factors, social and cultural dimensions also play a significant role in the success of health communication. In Indonesian society, particularly in rural areas, communication patterns are still heavily influenced by face-to-face interaction and visual approaches. Information conveyed orally and supported by visual aids is more readily accepted than lengthy texts. The Diffusion of Innovations theory emphasises that the adoption of innovations is influenced by the compatibility of the innovation with social norms and user characteristics (*compatibility*) (Rogers, 2003). With its simple, interactive and communicative design, Lembar Balik is highly suited to the social context of the community in Lebak Regency, where the majority of people have a lower secondary education or below.

Previous studies have also supported the use of visual aids in health education, finding that the image-based LINZI (Look, Assess, Nutrients) method is capable

of significantly improving the knowledge of nutrition cadres due to its participatory and contextual nature (Wardani et al., 2019). Furthermore, other research indicates that stunting prevention education using flipcharts is effective in improving the knowledge and attitudes of adolescent girls (EKA et al., 2024). Similar findings were reported by Basrudin et al., who found that the use of flipcharts in health education can significantly improve the knowledge and attitudes of patients with hypertension (Basrudin et al., 2024). Furthermore, Lugyana's research found that flipcharts and animated videos can improve mothers' understanding of how to manage febrile seizures in children at home (Nur, 2024). Therefore, in the context of community-based health promotion, visual, interactive and easily adaptable educational materials are essential for strengthening community engagement and fostering behavioural change.

At the national level, this study also supports the Ministry of Health's Primary Care Transformation policy, which emphasises the importance of community-based health promotion innovations to improve family health literacy. The Healthy Family Programme (PIS-PK) and the Reformed Posyandu place community health workers at the forefront of health education. However, the effectiveness of these workers is heavily influenced by the media they use. Through this study, it is hoped that empirical evidence can be obtained regarding the effectiveness of the 'Lembar Balik' as an innovative medium capable of strengthening the role of community health workers and increasing community participation in Posyandu activities.

Based on the above, this study was conducted with the aim of analysing the effectiveness of the Lembar Balik medium in improving the knowledge of mothers of young children regarding child growth and development, compared with the MCH Booklet, in Lebak Regency. It is hoped that the findings of this study will make a theoretical contribution to the development of visual media-based health education models, whilst also providing practical recommendations for policymakers on how to improve the effectiveness of child growth and development education programmes within the community.

METHOD

Study Design

This study employed a mixed-methods design using a convergent parallel design approach, which integrates quantitative and qualitative data simultaneously to gain a more comprehensive understanding of the effectiveness of educational media on child growth and development. The quantitative approach was conducted using a quasi-experimental pre-test post-test with control group design to compare changes in knowledge among mothers of toddlers between the group that received education using flipcharts and the group that used the KIA Book. The qualitative approach was conducted through in-depth interviews with health cadres to explore their experiences of using educational media during the Posyandu outreach

process. The integration of both approaches was carried out during the results interpretation stage to explain the relationship between the increase in knowledge scores and the cadres' experiences of using educational media in the field.

Study Setting and Period

The study was conducted in the catchment area of the Mandala Community Health Centre, Lebak District, Banten Province, Indonesia. Data collection took place from May to August 2025. The study area was selected because it has regular Posyandu activities, a relatively high number of mothers with young children, and active involvement of health cadres in community health promotion activities. Furthermore, this area still faces limitations in maternal health literacy regarding monitoring child growth and development, making it suitable as a location for the implementation of visual-based educational media.

Population and Sample

The study population comprised all mothers with infants aged 0–59 months in the catchment area of the Mandala Community Health Centre, totalling 180 individuals spread across five active Posyandu centres. The study sample was selected using purposive sampling based on pre-defined inclusion and exclusion criteria.

Inclusion criteria included mothers with children aged 0–59 months who could read and write, were willing to participate in the entire educational programme, and were willing to act as research participants by signing an informed consent form. Exclusion criteria included mothers who were absent from any stage of the study, did not complete the questionnaire, or were currently participating in a similar educational programme at another healthcare facility.

A total of 18 respondents met the study criteria and were divided into two groups: the flipchart group comprising 9 respondents and the MCH Book group comprising 9 respondents. The groups were divided according to their respective Posyandu centres to minimise the exchange of information between respondents during the intervention. In the qualitative approach, informants were selected using purposive sampling, taking into account the health workers' direct involvement in Posyandu educational activities. A total of six health workers were interviewed in depth until the data obtained showed information redundancy and reached saturation.

Research Variables

The independent variables in this study were the educational materials used during the health education sessions, namely flipcharts and the MCH Handbook. The dependent variable was the mothers' level of knowledge regarding child growth and development following the health education sessions.

Mothers' knowledge encompasses an understanding of the concepts of child growth and development, signs of developmental delay, monitoring the growth of toddlers, and age-appropriate developmental stimulation. In the

qualitative approach, the focus of the exploration is directed towards the volunteers' experiences regarding the ease of use of the media, the effectiveness of communication, the visual appeal of the media, barriers to using the media, and the volunteers' perceptions of the responses of mothers of toddlers during the educational activities.

Research Instruments

The quantitative instrument took the form of a knowledge questionnaire designed in accordance with the guidelines set out in the KIA Book and the child growth and development materials provided by the Ministry of Health of the Republic of Indonesia. The questionnaire for the KIA Book group comprised nine questions, whilst the flipchart group comprised eight questions tailored to the content of the flipchart materials. All questions were multiple-choice with a single correct answer. Before being used in the main study, the instrument was tested for validity and reliability on 30 respondents outside the study sample. The results of the validity test showed that all items had a corrected item-total correlation greater than 0.30 and were therefore deemed valid. The reliability test, using Cronbach's alpha, yielded a value of over 0.80, indicating that the instrument possessed good internal consistency. As the number of items in the two groups differed, the raw scores were converted to standardised scores on a scale of 0–100 to ensure comparability between the groups. The qualitative instrument utilised a semi-structured interview guide developed in line with the research objectives. The interview guide included questions regarding the volunteers' experiences of using educational media, the ease of delivering the material, participants' responses, barriers to using the media, and suggestions for developing educational media for child growth and development.

Development of Flipchart Media

The flipchart was developed by researchers based on materials designed to stimulate child growth and development, as contained in the KIA Book and the child development monitoring guidelines issued by the Ministry of Health of the Republic of Indonesia. The material is written in simple language, combining illustrative images with brief bullet points to aid understanding among mothers of young children during health education sessions. Each flipchart sheet has two sides: the front side, which contains an image and the key message for participants, and the back side, which contains explanatory guidelines for health workers. Before being used in the study, the flipcharts were reviewed by two midwifery lecturers and a health promotion officer from the Community Health Centre to assess the appropriateness of the content, visual clarity and comprehensibility of the educational messages.

Data Collection Procedures

Data collection was carried out in stages, beginning with the preparatory phase, through the implementation of the

intervention, and concluding with the final evaluation of the study. During the preparatory phase, the researchers coordinated with Mandala Community Health Centre and the Posyandu volunteers to finalise the schedule for the activities and ensure the research site was ready. Subsequently, the health cadres were given a brief orientation on the research objectives, educational communication techniques, the use of flipcharts, and the sequence for presenting material on child growth and development to ensure that the educational process was conducted uniformly across all respondent groups. Before the intervention was delivered, all participants were asked to complete a pre-test questionnaire to assess their baseline knowledge of child growth and development. Subsequently, participants in the intervention group received education using flipcharts, whilst the control group received education using the Maternal and Child Health (MCH) Handbook as the standard resource typically used at Posyandu clinics. The educational sessions were conducted in small groups and led directly by health cadres who had received prior training. The educational material covered the concepts of child growth and development, signs of developmental delay, monitoring of growth and development, and age-appropriate developmental stimulation. Each educational session lasted 45–60 minutes and employed a two-way communication approach to enable participants to discuss and ask questions actively throughout the session. Once all the material had been presented, respondents were again asked to complete a post-test questionnaire using the same instrument as the pre-test to assess changes in their level of knowledge following the educational session. All answer sheets were checked for completeness and then assigned an identification code to ensure respondent confidentiality prior to data processing. In the qualitative phase, in-depth interviews were conducted with health cadres involved in the educational activities to explore their experiences whilst using the flipchart and the MCH Book. The interviews were conducted face-to-face using a semi-structured interview guide, recorded with the informants' consent, and subsequently transcribed verbatim as material for qualitative analysis.

Data Analysis

Univariate analysis was conducted to describe the characteristics of the respondents and the distribution of

knowledge scores in terms of mean, standard deviation, median, interquartile range, frequency and percentage. Normality was tested using the Shapiro–Wilk test as the sample size in each group was less than 50 respondents, whilst homogeneity of variance was tested using Levene's test. Differences in knowledge scores before and after the intervention in each group were analysed using the Wilcoxon Signed Rank Test as some of the data were not normally distributed. Differences in the increase in knowledge scores between groups were analysed using the Independent Samples t-test on the gain scores after meeting the assumptions of normality and homogeneity of variance. To strengthen the interpretation of the research results, the analysis was also supplemented with effect size measurements using the *r* value in the Wilcoxon test, Cohen's *d*, and standardised mean difference (SMD), and reported within a 95% confidence interval. Qualitative data were analysed using thematic analysis through the stages of repeatedly reading transcripts, performing open coding, grouping codes into categories, and compiling main themes that describe the cadres' experiences in using educational media. The integration of quantitative and qualitative data was carried out during the results interpretation stage using a side-by-side comparison approach to gain a more comprehensive understanding of the effectiveness of flipchart media in child growth and development education.

Ethical Considerations

This study has received ethical approval from the Health Research Ethics Committee of the Banten Ministry of Health Polytechnic of Health Sciences, under reference number: 23/KEPK-PKB/V/2025. All respondents were provided with an explanation of the study's objectives, procedures, benefits and participants' rights prior to the study being conducted. Respondents willing to participate in the study were asked to sign an informed consent form as a form of written consent. The confidentiality of respondents' identities was maintained by using numerical codes for all research data, and all information obtained was used solely for academic and research purposes.

RESULT AND DISCUSSION

Descriptive Analysis

Table 1.

Some Findings from the Descriptive Analysis of the Respondent Groups

Group	Measurement	Minimum	Maximum	Range	Mean ± SD	Median (IQR)
flipchart	Pre-test	25,0	100	75,0	58,94 ± 20,53	58,3 (41,7–75,0)
	Post-test	75,0	100	25,0	85,03 ± 7,97	83,3 (83,3–91,7)
KIA Book	Pre-test	33,3	100	66,7	71,60 ± 22,32	75,0 (58,3–91,7)
	Post-test	55,5	100	44,5	79,82 ± 16,89	83,3 (66,7–91,7)

Descriptively, Table 1 shows that in both groups of respondents there was an increase in scores when viewed in terms of the minimum scores obtained (the minimum post-test scores in both groups were higher than the minimum pre-test scores obtained); similarly, when

viewed in terms of the mean scores of both groups, there was an increase (the mean post-test scores were higher than the mean pre-test scores obtained in both groups)

Bivariate Analysis

This section presents the results of the normality tests for the pre-test and post-test data from both groups of respondents (namely, the group of respondents who received education using the LEMBAR BALIK medium and the group of respondents who received education using the BUKU KIA medium); the purpose of this data normality test is to determine the type of test to be used, whether a

parametric test (dependent t-test) or a non-parametric test (Wilcoxon test). Once the type of test has been determined, the data is then tested to see whether there is a difference in the mean obtained before and after education using the specified educational media (Flipchart or KIA Book).

Table 2.
Results of the Normality and Homogeneity of Variance Tests for Knowledge Scores

Group	Measurement	The p-value	Data Distribution	Statistical Approach
flipchart	Pre-test	0,008	Abnormal	Uji Wilcoxon Signed Rank
	Post-test	0,030	Abnormal	
KIA Book	Pre-test	0,047	Abnormal	Uji Wilcoxon Signed Rank
	Post-test	0,200	Normal	

Table 2 shows that the data from both groups of respondents (the Flipchart group and the MCH Booklet group) are not normally distributed; therefore, the Wilcoxon non-parametric test was used to examine or test

for changes (increases in scores before and after the educational intervention) within each group.

Table 3.
Results of the Test for Differences in Means Between the Flipchart and MCH Book Groups

Group	Median Pre-test (IQR)	Median Post-test (IQR)	The p-value	Effect Size (r)	Interpretasi Effect Size
flipchart	58,3 (41,7–75,0)	83,3 (83,3–91,7)	0,011*	0,84	Besar
KIA Book	75,0 (58,3–91,7)	83,3 (66,7–91,7)	0,236	0,39	Small-medium

The effect size in the Wilcoxon test is calculated using the formula $r = Z/\sqrt{N}$. Interpretation of effect size: small (0.1), moderate (0.3) and large (≥ 0.5).

Table 4.
Results of the Combined Data Normality Test

Data	The p-value	Hasil	Test Decision
For testing	0.200	Data with a normal distribution	Parametric Test (Independent t-test)
Delta (Difference)	0.200	Data with a normal distribution	Parametric Test (Independent t-test)

Table 4 shows that both the pre-test data and the delta data (difference) are normally distributed; therefore, the appropriate test to use is a parametric test, namely the

independent t-test or the test for the difference between two independent means.

Table 5.
Results of the Test Comparing Pre-Test Scores Between the Flipchart Group and the KIA Book Group

Group	Mean ± SD	Nilai p Levene's Test	The t-value	The p-value	Standardized Mean Difference (SMD)
flipchart	58,94 ± 20,53	0,434	-1,252	0,229	0,59
KIA Book	71,60 ± 22,32				

Table 5 shows that, statistically speaking, there is no difference in the average knowledge scores between the Flipchart group and the KIA Book group, as the p-value obtained was 0.229 ($p > 0.05$). In other words, the initial

ability of the two groups is the same; and the results of the F-test indicate that the two respondent groups (Lembar Balik and Buku KIA) have the same variance

Table 6
Differences in Knowledge Gain Scores between the Flipchart Group and the MCH Book Group

Group	Mean Gain Score ± SD	Nilai p Levene's Test	The t-value	The p-value	95% confidence interval	Cohen's d	Interpretasi Effect Size
flipchart	26,09 ± 11,42	0,818	2,246	0,039*	1,00–34,73	1,06	Besar
KIA Book	8,22 ± 10,15						

Table 6 shows that the mean increase in knowledge scores (gain score) in the flipchart group was higher than that in the MCH Book group. The results of the Independent Samples t-test indicate a statistically significant difference in knowledge score gains between the two groups ($p = 0.039$). The Levene's Test value indicates that the variances of the two groups are homogeneous ($p = 0.818$), thus fulfilling the assumption of homogeneity of variances. In addition to being statistically significant, the difference between the groups also demonstrates strong practical significance with a Cohen's d value of 1.06, which falls into the category of a large effect size. The 95% confidence interval indicates that the difference in the mean increase in knowledge scores lies within the range of 1.00 to 34.73. These results indicate that the use of the flipchart is more effective in improving mothers' knowledge than the use of the KIA Book. These quantitative findings are supported by the results of in-depth interviews with health cadres, who stated that the flipchart is easier to use in the educational process because it has a simpler visual layout, larger text, and guidance on how to present the material on the back of the flipchart. Conversely, the KIA Book was considered to contain more material and to require more time to find relevant information. One of the cadres stated that:

"If the text on the back page is larger, it's more appealing. It's easier for us to explain because there are notes and explanations on the back."

Another party member also stated:

"It explains what the development is like and what the growth is like, with easy-to-understand illustrations."

The results indicate consistency between the quantitative and qualitative data, showing that flipchart materials are more practical and effective in supporting children's growth and development education at PosyanduMCH Handbook. This facilitates health workers' explanation of the material whilst helping mothers of young children to understand the educational content provided. Informants noted that the predominant use of visual aids made participants more engaged with the material during the session. In addition to the visual aspect, health workers also felt that the flipchart enhanced the effectiveness of educational communication, as it contained brief explanatory points that could be read directly during the session. Some health workers stated that the guide helped them explain the material more systematically and boosted their confidence when providing education to the community. Nevertheless, some informants acknowledged that the MCH Book has the advantage of containing more complete and

comprehensive material. The KIA Book is considered useful as a resource for self-directed learning at home as it contains comprehensive information on maternal and child health, ranging from pregnancy to toddler development. Consequently, some health workers view the use of the KIA Book as remaining important as a complement to Posyandu education.

The interview results also revealed obstacles to the use of the MCH Book during health education sessions. Some health workers reported that the large number of pages and small font size made the educational process impractical. Furthermore, some mothers of toddlers were found to be less interested in reading the KIA Book because the content was too dense and text-heavy. Other findings indicated that some health workers had never received specific training on the use of the KIA Book. This situation led some health workers to find it difficult to locate the relevant pages and to lack a clear understanding of how to use the KIA Book optimally during the educational process. Overall, the results of the qualitative analysis reinforce the quantitative findings of the study, which indicate that the Flip Chart is more effective in improving mothers' knowledge of child growth and development compared to the KIA Book. The integration of these two sets of results suggests that the effectiveness of educational media is influenced by the simplicity of the visual design, the ease of use of the media, the media's ability to support health workers' communication, and the level of participant engagement during the Posyandu educational process.

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ability to support health workers' communication, and the level of participant engagement during the Posyandu educational process.

This study shows that health education using flipcharts leads to a greater improvement in mothers' knowledge of child growth and development compared to the use of the MCH Booklet. These findings were consistently evident in both the quantitative analysis and the in-depth interviews with health workers. In general, flipcharts were considered easier to use, more practical, more visually appealing, and more helpful to health workers in conveying health information to mothers of young children at Posyandu clinics. Conversely, the KIA Book was perceived as more complex because it contained a very wide range of material, had many pages, and used relatively small print, meaning it took longer to find relevant information. The integration of these quantitative and qualitative results reinforces the validity of the study's findings that the effectiveness of health education is influenced not only by the content of the material but also by the characteristics of the communication medium used in the health education process.

The greater increase in knowledge observed in the flipchart group indicates that simple, structured visual educational materials are more effective in supporting the process of health information uptake among mothers of young children. Flipcharts enable health workers to provide explanations in a more systematic manner, as each page is arranged in the order of the material to be presented. Furthermore, the presence of images, key points, and explanatory guidelines on the reverse side of the material helps health workers maintain the flow of communication throughout the health education session. This makes the educational process more interactive and helps mothers understand the health messages being conveyed. These findings are consistent with cognitive load theory, which states that educational material that is simple, focused, and visual is easier for working memory to process than material that is overly complex and information-dense. (Longino, 2015)

Interviews with health workers revealed that the majority felt more confident using flipcharts than the MCH Handbook. The health workers stated that flipcharts were easier to use because they had 'cheat sheets' or explanatory guides on the back, which helped them deliver the material without having to search for specific pages, as is the case with the MCH Handbook. These findings suggest that the effectiveness of educational materials is also influenced by how easy they are for facilitators to use. In the context of Posyandu, health cadres have diverse educational backgrounds and communication skills; therefore, materials that are simple, visual and easy to use are crucial for maintaining the quality of health message delivery. Previous research has shown that visual educational materials and the use of easily understandable language can enhance the effectiveness of health workers' communication with the community and facilitate the health education process within the community (Awasthi et al., 2019)

In addition to making things easier for health workers, flip-chart media are also considered more appealing to mothers of young children as they feature larger images and a simpler layout. Some health workers noted that mothers of young children tend to be less interested in reading material with long, dense text, such as that found in the MCH Handbook. These findings suggest that visual elements play a key role in enhancing participants' attention and engagement in health education. In public health communication, the use of visual media is known to help improve understanding of health information, strengthen message retention, and make it easier for groups with low health literacy to receive and remember the information provided. Previous research has shown that image-based educational materials are more effective in improving public understanding than materials dominated by long text, as visuals aid the information processing and capture the attention of the target audience. (Garcia-Retamero & Cokely, 2017). Although this study shows positive results, several contextual factors may have influenced the magnitude of the intervention's effect. Mothers' educational levels, family health literacy, the volunteers' experience, and the community's reading habits may act as moderating factors affecting the effectiveness of educational materials. Mothers with better health literacy are likely to find it easier to understand the contents of the MCH Booklet than those with limited reading skills. Conversely, flipchart media may be more effective among community groups with a preference for visual learning and direct verbal communication. Furthermore, the health workers' experience in delivering health education may also influence the quality of the educational material delivery. Health workers who are more active and experienced are likely to be able to utilise the media more effectively than those who are not yet accustomed to health communication. These factors need to be taken into account when interpreting the research results and developing community health education programmes (Mattingly et al., 2021).

In practical terms, the findings of this study have direct implications for improving the effectiveness of Health Promotion and MCH (Maternal and Child Health) programmes. The flipchart can be used as a supplementary resource to the MCH Handbook in Posyandu activities, volunteer training sessions, and classes for mothers of young children. Through this approach, volunteers can feel more confident in conveying health messages, whilst mothers become more actively involved in educational activities.

From a policy perspective, this study supports the Primary Care Transformation policy and the Posyandu Reform programme, which position community health workers as the spearhead of public education. The Lembar Balik medium can strengthen the role of community health workers as *agents of change* within their communities by providing a simple, effective and engaging communication tool.

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CONCLUSIONS

In the context of urbanization and the consequent This study shows that the use of the Flip Chart is more effective than the MCH Book in improving the knowledge of mothers of young children regarding their children's growth and development. This effectiveness is not only due to its visual format, but also to its ability to facilitate two-way communication between health workers and mothers. The Flip Chart is able to create a participatory learning process, in which mothers play an active role in understanding and relating the information to their everyday experiences. This medium contributes to improving community health literacy through the delivery of messages that are simple, engaging, and contextualised to local culture. The findings of this study reinforce theories of social learning, constructivism, and dual coding, which emphasise the importance of combining text, visuals, and interaction in the learning process. In practical terms, Lembar Balik has the potential to serve as a supplementary educational

medium to the KIA Book in the Health Promotion and Posyandu Reform programmes, as well as supporting the Ministry of Health's Primary Care Transformation policy. This medium can strengthen the role of community health workers as agents of change in raising mothers' awareness and knowledge regarding child growth and development stimulation. Thus, the Flip Chart is not merely an educational aid, but also a means of community empowerment capable of strengthening the effectiveness of community-based health communication and serving as a sustainable innovation in early childhood health promotion.

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