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Effectiveness of Stunting Education Flipcharts and Pocket Books on Toddler Mothers' Knowledge and Attitudes in Muaro Jambi, Indonesia

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ABSTRACT

Stunting is a nutritional problem caused by a prolonged lack of nutritional intake during the first 1,000 days of life (HPK), which is a critical period, resulting in growth disorders in children, namely a child's height is lower or shorter (dwarfism) than the standard for their age.The Indonesian Nutrition Status Survey (SSGI) in 2022 resulted in a national stunting rate of 21.6%. The purpose of this study was to determine the effectiveness of Stunting Education Flip Sheet Media and Pocket Books on the knowledge and attitudes of mothers of toddlers in the work area of the Penyengat Olak. The research used a pre-experiment design with a one-group pre-test and post-test design. A total of 94 mothers of toddlers were selected through stratified random sampling. Data were collected using a structured questionnaire administered before and after the educational intervention. The intervention consisted of health education sessions utilizing flipcharts and pocket books as learning media. Statistical analysis was conducted using the paired sample t-test to examine differences in knowledge and attitude scores before and after the intervention, with a significance level set at $p < 0.05$. The results showed a statistically significant increase in both knowledge and attitude scores after the intervention ($p < 0.05$), indicating that the use of flipcharts and pocket books effectively improved mothers' understanding and attitudes toward stunting prevention. In conclusion, stunting education delivered through flipcharts and pocket books is an effective strategy to enhance maternal knowledge and attitudes, and it can be recommended as an educational tool in community health programs to support stunting prevention efforts.

INTRODUCTION

One of the problems of malnutrition that is still quite high in Indonesia is the problem of shortness (stunting) and thinness (wasting) in toddlers as well as the problem of anemia and chronic energy deficiency (KEK) in pregnant women. This problem of malnutrition in pregnant women can cause low birth weight (LBW) and malnutrition in toddlers, including stunting. (Sekretariat wakil presiden RI, 2018) Stunting is a condition of failure to thrive in toddlers (babies under five years old) due to chronic malnutrition, so that children are too short for their age. (Dirjen Kesmas, 2018) Stunting can occur as a result of malnutrition, especially during the First 1000 Days of Life (HPK). One way to prevent stunting is to fulfill nutritional and health services to pregnant women (Mukhlis, 2025a; Mukhlis & Saidah, 2025). This effort is very necessary, considering that stunting will affect the child's intelligence level and health status in adulthood. (Sekretariat wakil presiden RI, 2018).

Stunting is influenced not only by economic factors such as low household income but also by limited parental knowledge regarding nutrition and child care (Soekatri et al., 2020). A study conducted in Pati Regency identified inadequate maternal knowledge as one of the significant determinants of stunting (Sulistiyaningsih & Niamah, 2021). Therefore, improving maternal knowledge through health education is considered a strategic intervention in stunting prevention programs. Health education counseling serves as a promotional approach to disseminate information

and enhance knowledge. Various educational media can support this approach, including printed materials such as flipcharts and pocket books (Umma Khairul, 2018).

Research by Sutrisno et al. (2022) demonstrated the effectiveness of flipcharts as a health promotion medium through a systematic review of ten eligible articles (Sutrisno & Sinanto, 2022). Similarly, Angraini et al. (2020) reported an increase in maternal knowledge after receiving stunting education using flipcharts at the Arga Makmur Health Center, North Bengkulu Regency. These findings indicate that visual and printed educational media can positively influence knowledge improvement.

However, previous studies have primarily focused on single educational media and have predominantly measured knowledge outcomes, with limited attention to changes in attitudes, which are equally important in shaping preventive behavior. In addition, there is still limited empirical evidence comparing or integrating multiple printed educational media—such as flipcharts and pocket books—within community health center settings, particularly in high-prevalence areas. This represents a clear knowledge gap regarding the combined effectiveness of these two complementary media in improving both knowledge and attitudes among mothers of toddlers.

Flipcharts were selected in this study because they provide structured, visual, and interactive explanations that facilitate face-to-face counseling sessions, especially for audiences with varying literacy levels (Mukhlis, Janwari, et al., 2023; Mukhlis & Abdullah, 2025). Meanwhile, pocket books were chosen as supplementary media that allow mothers to revisit key information independently at home, thereby reinforcing message retention and supporting sustained attitude change. The integration of these two media is expected to create a more comprehensive educational approach by combining visual engagement during counseling with continuous self-learning support.

Based on data from the 2022 Indonesian Nutritional Status Survey (SSGI), the stunting prevalence in Jambi Province was 18.0%, decreasing from 22.4% in 2021 (Dinkes Provinsi Jambi, 2019). However, the highest prevalence in the province was recorded in Muaro Jambi Regency at 27.2%, compared to 17.4% in Jambi City (Dinkes Muaro Jambi, 2021). Given the relatively high prevalence of stunting in Muaro Jambi and the importance of maternal knowledge and attitudes in prevention efforts, it is essential to examine the effectiveness of targeted educational interventions in this specific local context. Therefore, this study aims to evaluate the effectiveness of stunting education using flipcharts and pocket books in improving the knowledge and attitudes of mothers of toddlers in Muaro Jambi Regency.

RESEARCH METHODS

This research uses a quantitative approach. The research method used is a pre-experiment with a one-group pre-test and post-test design (Teo, 2013; Vinod, 2022). The design involves conducting an initial measurement (pre-test) before the intervention and a subsequent measurement (post-test) after the intervention to assess changes in the dependent variables.

The one-group pre-test and post-test design was selected because this study aimed to evaluate the immediate effect of an educational intervention within a real community health service setting where randomization and the establishment of a control group were not feasible for ethical and administrative reasons (Haddon, 2011; Pole & Lampard, 2015)

. All eligible mothers were expected to receive stunting education as part of routine health promotion activities at the Community Health Center, making it impractical to withhold the intervention. This design allows for the measurement of within-subject changes in knowledge and attitudes before and after exposure to the educational media, thereby providing preliminary evidence of intervention effectiveness in a naturalistic setting.

This research was conducted in the Penyengat Olak Community Health Center (Puskesmas) work area in Muaro Jambi. The study period was April–November 2025. The population in this study consisted of 1,493 mothers with toddlers registered in the Penyengat Olak Community Health Center work area.

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The sample size was determined using the Slovin formula with a 95% confidence level and a margin of error of 10%, resulting in a minimum required sample of 94 respondents (Dee & Ferrantino, 2005; Wang, 2014)

. This calculation ensured that the selected sample adequately represented the target population while maintaining acceptable precision for estimating the intervention effect.

Sampling was conducted using purposive sampling (Notoatmodjo, 2018). Purposive sampling was chosen to ensure that participants met specific characteristics relevant to the study objectives, particularly mothers of toddlers who actively attended Posyandu services and were exposed to the educational intervention. This approach allowed the researcher to select respondents who were directly involved in child health activities and therefore most relevant for assessing changes in knowledge and attitudes toward stunting prevention.

The respondent criteria used in the study were:

a. Inclusion Criteria
   1. Mothers with toddlers attending the Penyengat Olak Community Health Center
   2. Mothers attending the integrated health post (Posyandu)
   3. Mothers who can read and write

b. Exclusion Criteria
   1. Mothers experiencing health problems
   2. Mothers who were not present during the study period
   3. Mothers who were unwilling to participate as respondents

Research Instruments and Materials

This study used a questionnaire consisting of structured questions/statements that had been tested for validity and reliability (Haddon, 2011; Pole & Lampard, 2015). Content validity was assessed through expert judgment, and reliability was evaluated using Cronbach's alpha coefficient to ensure internal consistency of the knowledge and attitude scales. Primary data collection using the questionnaire was conducted in August 2025.

RESULTS

The research objective was to determine the effectiveness of educational flipcharts and pocketbooks on the knowledge and attitudes of mothers of toddlers in the Penyengat Olak Community Health Center, Jambi Luar Kota District, Muaro Jambi Regency, in 2025. Two methods of analysis were used: univariate and bivariate analysis. Univariate analysis examined frequencies, while bivariate analysis examined the influence of independent and dependent variables.

The sample size for this study was 94 mothers of toddlers who met the inclusion criteria. They were divided into two groups: 47 mothers of toddlers who received educational flipcharts and 47 mothers of toddlers who received educational pocketbooks.

3.1 Effectiveness of stunting education flipcharts and pocket books on the knowledge of mothers of toddlers in 2025

The analysis of differences and comparison of the effectiveness of the stunting education flipchart and pocket book on the knowledge of mothers of toddlers in 2025 can be analyzed using the T-Dependent Test and the results of the average value in each intervention group can be seen in the following table:

Table 3.1
Distribution Effectiveness of stunting education flipcharts and pocket books on the knowledge of mothers of toddlers in 2025
(n=47)

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Intervensi	Mean	difference	P Value
Knowledge after education flipcharts	11.62	3.05	0.001
Knowledge after education pocket books	13.26	2.26	

Based on table 3.1, the results of the statistical test using T-Dependent value = 0.001 (p <0.05), there is a significant difference between the two groups regarding the knowledge of mothers of toddlers before and after being given education using flipcharts and pocket books. The average increase after the flipchart intervention is 11.62, while in the pocket book intervention the average increase is 13.26, therefore Ho is accepted there is a difference between the two intervention groups.

1.2 Effectiveness of stunting education flipcharts and pocket books on the attitude of mothers of toddlers in 2025

The analysis of differences and comparison of the effectiveness of the stunting education flipchart and pocket book on the attitudes of mothers of toddlers in 2025 can be analyzed using the T-Dependent Test and the results of the average value in each intervention group can be seen in the following table:

Table 3.2
Distribution Effectiveness of stunting education flipcharts and pocket books on the attitude of mothers of toddlers in 2025
(n=47)

Intervensi	Mean	difference	P Value
Attitude after education flipcharts	14.62	1.90	0.000
Attitude after education pocket books	14.77	1.51	

Based on table 5.15, the results of the statistical test using T-Dependent value = 0.000 (p <0.05), there is a significant difference between the two groups regarding the attitudes of mothers of toddlers. The average increase after the flipchart intervention is 14.62, while in the pocketbook intervention the average increase is 14.77. Therefore, Ho is accepted, there is a difference between the two intervention groups.

DISCUSSION

3.1 Effectiveness of stunting education flipcharts and pocket books on the knowledge of mothers of toddlers in 2025

Based on table 3.1, the results of the statistical test using T-Dependent value = 0.001 (p <0.05), there is a significant difference between the two groups regarding the knowledge of mothers of toddlers before and after being given education using flipcharts and pocket books (Mukhlis, Maryam, et al., 2023; Mukhlis et al., 2024). The average increase after the flipchart intervention is 11.62, while in the pocket book intervention the average increase is 13.26, therefore Ho is accepted there is a difference between the two intervention groups.

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A printed pocketbook is a physical version printed in a small size (usually A6 or smaller), lightweight, and easy to carry anywhere. This medium is highly effective for field outreach activities, such as integrated health posts (Posyandu), home visits, or school activities. Furthermore, printed books do not rely on technology or internet networks, making them particularly suitable for use in areas with limited digital access. Printed pocketbooks are information-dense visual aids that can be used to reinforce material delivery during direct interactions with the community (Maulana, 2009). (11) The results of Amriani's (2023) study, "The Effectiveness of Using an Android-Based Digital Pocketbook to Increase Knowledge of Preconceptional Stunting Prevention in Adolescents in the Tompobulu Community Health Center, Gowa Regency" work area, showed that the use of an Android-based digital pocketbook was significantly effective in increasing adolescent knowledge of preconceptional stunting prevention in the Tompobulu Community Health Center, Gowa Regency (12). According to Notoatmojo (2017), through knowledge, mothers will become more aware and more receptive to things that are beneficial for their personal improvement. A higher level of knowledge will facilitate easier access to ideas and technology, particularly in healthcare. Conversely, a lack of knowledge will hinder the development of attitudes toward healthy lifestyle changes.

3.2 Effectiveness of stunting education flipcharts and pocket books on the attitude of mothers of toddlers in 2025

Based on table 3.2, the results of the statistical test using T-Dependent value = 0.000 ($p < 0.05$), there is a significant difference between the two groups regarding the attitudes of mothers of toddlers (Mukhlis, Arifin, Ridwan, & Zulbaidah, 2025; Mukhlis, Arifin, Ridwan, Zulbaidah, et al., 2025). The average increase after the flipchart intervention is 14.62, while in the pocketbook intervention the average increase is 14.77. Therefore, Ho is accepted, there is a difference between the two intervention groups. Attitude is a person's closed response to a particular stimulus or object that involves emotional factors. Positive attitudes tend to like and anticipate a particular object, while negative attitudes tend to avoid, hate, and dislike the object revealed that attitudes influence health behaviors. (Notoatmodjo, 2017) The attitudes of mothers of toddlers toward integrated health services (Posyandu) directly impact their participation in Posyandu activities, including weighing toddlers (Mukhlis, 2025b; Mukhlis, Suradi, et al., 2023). Positive attitudes encourage active participation, while negative attitudes can hinder participation, which ultimately impacts child growth monitoring and the prevention of nutritional problems such as stunting.

CONCLUSION

There is a significant difference between the two groups regarding the knowledge of mothers of toddlers before and after being given education using flipcharts and pocket books. The average increase after the flipchart intervention is 11.62, while in the pocket book intervention the average increase is 13.26, therefore Ho is accepted there is a difference between the two intervention groups.

Overall, these findings indicate that both flipcharts and pocket books are effective educational media for improving maternal knowledge and attitudes toward stunting prevention, with pocket books showing a slightly higher increase in knowledge scores. The results highlight the importance of structured, accessible, and visually supported educational materials in strengthening maternal capacity to prevent stunting at the community level. This study contributes to the existing literature by providing empirical evidence on the comparative effectiveness of two printed educational media within a primary health care setting, particularly in a high-stunting-prevalence area. Practically, the findings suggest that community health centers (Puskesmas) and Posyandu programs can integrate

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flipcharts for interactive counseling sessions and pocket books for continuous home-based learning to maximize educational impact.

Future research is recommended to employ more rigorous designs, such as quasi-experimental or randomized controlled trials with control groups, to strengthen causal inference. Further studies may also explore long-term behavioral outcomes, such as actual feeding practices and child nutritional status, to assess whether improvements in knowledge and attitudes translate into sustained preventive behaviors.

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES

Amriani, Sudirman, J., & Nurqalbi. (2023). PEMANFAATAN BUKU SAKU DIGITAL BERBASIS ANDROID TERHADAP PENINGKATAN PENGETAHUAN REMAJA TENTANG PENCEGAHAN STUNTING. Jurnal Ilmiah PANNMED (Pharmacist, Analyst, Nurse, Nutrition, Midwivery, Environment, Dentist), 18(2), 234–239. https://doi.org/10.36911/pannmed.v18i2.1601

Angraini, W. Pratiwi, B. A. Amin, M. Yuniarti, R. Febriawati, H. & Shaleh, M. I. (2020). Edukasi Kesehatan Stunting di Kabupaten Bengkulu Utara.Jurnal Ilmu Kesehatan, 30-36.

Dinas Kesehatan Provinsi Jambi. 2019.Data Stunting Provinsi Jambi. Jambi

Dinas Kesehatan Muaro Jambi. 2021.Data Stunting Kabupaten Muaro Jambi. Jambi

Direktur Jenderal Kesehatan Masyarakat. (2018). Wartakesmas. Jakarta

Maulana, H. (2009). Promosi Kesehatan. EGC.

Notoadmodjo, S. (2017). Konsep Perilaku Manusia. Jakarta: EGC

Notoadmodjo, S. (2018). Metodologi Penelitian Kesehatan. Jakarta: Rineka Cipta.Olsa, dkk. 2017. Hubungan Sikap dan Pengetahuan Ibu Terhadap Kejadian Stunting Pada Anak Baru Masuk Sekolah Dasar di Kecamatan Nanggalo. Jurnal Kesehatan Andalas, Volume:6. Nomor:3. Universitas Andalas. Padang.

Sekretariat wakil presiden RI. (2018). Strategi Nasional Percepatan Pencegahan Anak Kerdil (Stunting) periode 2018-2024. Jakarta: Kementerian Koordinator Bidang Pembangunan Manusia dan Kebudayaan.

Soekatri, M. Y., Sandjaja, S., & Syauqy, A. (2020). Stunting was associated with reported morbidity, parental education and socioeconomic status in 0.5–12-year-old Indonesian children. International Journal of Environmental Research and Public Health, 17(17), 6204.

.

Sulistiyaningsih, S. H., & Niamah, S. (2021). Analisis Faktor Yang Mempengaruhi Kejadian Stunting Pada Balita Di Wilayah Puskesmas Kabupaten Pati. Coping: Community of Publishing in Nursing, 8(4), 382.).

Sutrisno, S., & Sinanto, R. A. (2022). Efektivitas Penggunaan Lembar Balik sebagai Media Promosi Kesehatan : Tinjauan Sistematis. Jurnal Kesehatan Terpadu (Integrated Health Journal), 13(1), 1–11. https://doi.org/10.32695/jkt.v13i1.129

Umma Khairul. (2018). Pelaksanaan Program Promotif dan Preventif di Puskesmas Labuhan Bilik Kabupaten Labuhan Batu Tahun 2018. Universitas Sumatera UtaraDee, P., & Ferrantino, M. (2005). *Quantitative methods for assessing the effects of non-tariff measures and trade facilitation* (p. 665). World Scientific Publishing Co.; Scopus. https://doi.org/10.1142/5663

Haddon, M. (2011). *Modelling and Quantitative Methods in Fisheries, Second Edition* (p. 452). CRC Press; Scopus. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85058486365&partnerID=40&md5=2fa85f9de6d17f460cd808b2ca27e6a5

Mukhlis, L. (2025a). A Phenomenological Study of Personal Spiritual Experiences in Navigating Religious Pluralism within Interfaith Communities. *Irfana: Journal of Religious Studies*, *1*(6), 212–220.

Mukhlis, L. (2025b). Spiritual Grounds for Economic Growth: A Qualitative Exploration of Rural Indonesian Women's Transformative Journeys Through Mosque-Led Empowerment Programs. *Servina: Jurnal Pengabdian Kepada Masyarakat*, *1*(8), 289–298.

Mukhlis, L., & Abdullah, M. N. (2025). *Hukum Keluarga Islam di Indonesia* (1st edn). Mukhlisina Revolution Center.

Mukhlis, L., Arifin, T., Ridwan, A. H., & Zulbaidah. (2024). Integrating Artificial Intelligenceand Maqāṣid al-Syarī'ah: Revolutionizing Indonesia's Sharia Online Trading System. *Computer Fraud and Security*, *2024*(11), 301–309. https://doi.org/10.52710/cfs.238

Mukhlis, L., Arifin, T., Ridwan, A. H., & Zulbaidah. (2025). Reorientation of Sharia Stock Regulations: Integrating Taṣarrufāt al-Rasūl and Maqāṣid al-Sharī'ah for Justice and Sustainability. *Journal of Information Systems Engineering and Management*, *10*(10s), 58–66. https://doi.org/10.52783/jisem.v10i10s.1341

Mukhlis, L., Arifin, T., Ridwan, A. H., Zulbaidah, Rosadi, A., & Solehudin, E. (2025). Reformulation of Islamic Stock Law: The Application of Taṣarrufāt al-Rasūl and Maqāṣid al-Syarī'ahto Develop a Dynamic and Sustainable Islamic Capital Market in Indonesia. *Journal of Posthumanism*, *5*(3), 1–13. https://doi.org/10.63332/joph.v5i3.913

Mukhlis, L., Janwari, Y., & Syafe`i, R. (2023). INDONESIA STOCK EXCHANGE: THEORETICAL AND PHILOSOPHICAL ANALYSIS OF MUDHARABAH AND MUSYARAKAH CONTRACTS. *Yurisprudentia: Jurnal Hukum Ekonomi*, *9*(2), 243–264. https://doi.org/10.24952/yurisprudentia.v9i2.8466

.

Mukhlis, L., Maryam, S., & Sormin, S. A. (2023). Model Pembelajaran Living History Berbasis PjBL Untuk Meningkatkan Keterampilan Histografi Mahasiswa. *Jurnal Educatio FKIP UNMA*, *9*(4), 1800–1809. https://doi.org/10.31949/educatio.v9i4.5595

Mukhlis, L., & Saidah, Y. (2025). Dynamics of Nature-Based learning in Developing Children's Motoricic Skills: Teacher and Parent Perspectives. *HUMANISMA: Journal of Gender Studies*, *9*(1), 64–79. http://dx.doi.org/10.30983/humanisme.v4i2.9366

Mukhlis, L., Suradi, Janwari, Y., & Syafe`i, R. (2023). Sosialisasi Saham Syariah sebagai Instrumen Pengembangan Ekonomi Masyarakat di Badan Kontak Majelis Taklim (BKMT) Kabupaten Mandailing Natal. *Jurnal Pengabdian Multidisiplin*, *3*(2), 2–9. https://doi.org/10.51214/japamul.v3i2.604

Pole, C., & Lampard, R. (2015). *Practical social investigation: Qualitative and quantitative methods in social research* (p. 322). Taylor and Francis Inc.; Scopus. https://doi.org/10.4324/9781315847306

Teo, T. (2013). *Handbook of quantitative methods for educational research* (p. 404). Sense Publishers; Scopus. https://doi.org/10.1007/978-94-6209-404-8

Vinod, H. D. (2022). *HANDS-ON INTERMEDIATE ECONOMETRICS USING R: Templates for Learning Quantitative Methods and R Software, Second Edition* (p. 608). World Scientific Publishing Co.; Scopus. https://doi.org/10.1142/12831

Wang, F. (2014). *Quantitative Methods and Socio-Economic Applications in GIS: Second Edition* (p. 294). CRC Press; Scopus. https://doi.org/10.1201/b17967