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# THE IMPACT ON INFANT WEIGHT OF USING THE BABY-LED WEANING METHOD TO INTRODUCE COMPLEMENTARY FOODS

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## ABSTRACT

**Background**: During early childhood, a period of rapid growth, malnutrition remained a major concern, with millions of infants worldwide affected by underweight, and stunting. Unresolved, this condition led to poor growth, weakened immunity, and delayed cognitive development. Baby-Led Weaning (BLW), a method where infants aged six months and older self-fed solid foods, offered a potential solution by encouraging food exploration, chewing skills, and appetite. Therefore, this study aimed to evaluate the impact of BLW-based complementary feeding on infant weight gain.
**Methods**: This study employed a quasi-experimental design with a one-group pretest-posttest approach. An accidental sampling technique was used to select 15 infants aged 9 to 24 months. The intervention period lasted for 14 consecutive days, during which the BLW method was implemented at the participants' homes under the guidance of the researcher. Data were collected through observations of infant weight measurements and analyzed using a paired t-test.
**Results**: The study found that the average infant weight increased from 9.53 kg before the BLW intervention to 10.05 kg afterward. A paired t-test revealed a statistically significant difference, with a p-value of 0.000 ($p < 0.05$).
**Conclusion**: These findings indicate that complementary feeding using the BLW method effectively increased infant weight. Therefore, the BLW approach is recommended for mothers introducing complementary foods, as it may support optimal growth and development in infants.
**Keywords:** Baby-Led Weaning (BLW), complementary feeding, infant weight

## INTRODUCTION

The first five years of life represent a golden and critical period marked by rapid growth and development. During this stage, adequate nutrition is essential to support optimal outcomes. Following exclusive breastfeeding, infants require nutrient-dense complementary foods to meet their increasing nutritional needs between 6 and 24 months of age (Lutter et al., 2021). According to the World Health Organization (WHO), complementary feeding helps introduce new food types, strengthen the immune system, and promote healthy growth (WHO, 2025). Inadequate nutrition during this period may result in growth disorders and long-term developmental delays that can persist into adulthood.

According to WHO data from 2019, approximately 52 million infants (8%) were affected by wasting, and 115 million (23%) experienced stunting globally (WHO, 2019). In the same year, the Nutritional Status Monitoring by the Indonesian Ministry of Health

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reported that 3.8% of Indonesian children aged 0–59 months were severely malnourished, while 14% were moderately malnourished (UNICEF, 2020). More recently, in 2023, Jember District recorded 1,741 cases (1.1%) of infants with poor nutritional status among those who were weighed (Dinkes, 2024).

Poor nutritional status, as indicated by falling below the red line on infant health cards, was generally attributed to inadequate dietary intake in both quantity and quality, particularly after six months of age when infants began requiring complementary foods (WHO, 2023). Inappropriate feeding practices, such as offering foods with unsuitable textures, infrequent meals, or low nutrient density, often failed to meet infants' essential energy and nutrient needs, including protein, iron, and zinc (Moideen et al., 2024). This condition posed serious risks to growth and development, increasing the likelihood of stunting, weakened immunity, and long-term cognitive impairment (Soliman et al., 2021). Therefore, targeted nutritional interventions, particularly through education on age-appropriate and balanced complementary feeding, were crucial to preventing malnutrition during early life.

One innovative approach to addressing infant malnutrition, particularly related to complementary feeding, was the Baby-Led Weaning (BLW) method. This technique allowed infants to self-feed age-appropriate, graspable foods, promoting early exposure to various flavors, textures, and food types (Ripton & Potock, 2016). The BLW method is in line with the infant's oral stage of development, when they use their mouths to naturally investigate their surroundings by biting and chewing (Neves et al., 2018). By encouraging oral-motor stimulation and independent feeding, BLW complements both physiological and psychological milestones in early childhood. BLW encouraged greater interest in eating, reduced the likelihood of picky eating, and supported the development of healthy eating habits (Jayati, 2024). It also enabled infants to regulate intake based on hunger and satiety cues, fostering a positive relationship with food.

The BLW method involves offering finger foods and allowing self-feeding at an early age, parental education on food selection, choking prevention, and appropriate supervision during meals is essential (Correia et al., 2024). Ensuring these safety measures allows for the effective implementation of BLW, which may contribute to better nutritional outcomes. In line with this, this study aimed to evaluate the impact of BLW-based complementary feeding on infant weight gain.

## RESEARCH METHOD

This study employed a quasi-experimental one-group pretest-posttest design using quantitative methods. The population consisted of 20 babies aged 9 to 24 months. A total 15 infants were selected as the sample using accidental sampling. Inclusion criteria were infants aged 9–24 months who could sit upright with head control and had parental consent. Exclusion criteria were infants who were ill or unable to complete the intervention due to illness or extended travel. The BLW intervention was guided by Standard Operating Procedures (SOPs). Infant weight was measured using a calibrated baby scale. General participant data were collected using an identity questionnaire. Infant weight was observed as the primary data collection method. The BLW intervention was administered by the researcher over a 14-day period at each participant's home to ensure adherence to the intervention protocol. Data were analyzed using a paired t-test, following standard procedures of editing, coding, scoring, and tabulation. This study received ethical clearance from the Health Research Ethics Committee of the Faculty of Health Sciences, Universitas dr. Soebandi, with approval number: 816/KEPK/UDS/II/2025.

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## RESULTS

The characteristics of respondents in this study on the effect of complementary feeding using the Baby-Led Weaning (BLW) method on infant weight included age and gender, as detailed below.

Table 1. Respondent Characteristics Based on Infant Age

| Age | Frequency | Percentage |
|---|---|---|
| 9-12 months | 3 | 20.0 |
| 13-16 months | 3 | 20.0 |
| 17-20 months | 5 | 33.3 |
| 21-24 months | 4 | 26.7 |
| **Total** | **15** | **100** |

Based on Table 1, it can be seen that the largest number of respondents were aged 17-20 months, with 5 babies or 33.3%. The distribution of respondents by gender is presented in Table 2 below.

Table 2. Respondent Characteristics Based on Infant Gender

| Gender | Frequency | Percentage |
|---|---|---|
| Boys | 9 | 60.0 |
| Girls | 6 | 40.0 |
| **Total** | **15** | **100** |

Based on Table 2, it can be seen that some of the respondents consisted of 9 male infants with a percentage of (60.0%). In addition to respondent characteristics, this study also examined changes in infant weight before and after the BLW intervention. The results of the paired t-test analysis are presented to determine the significance of weight differences following the intervention.

Table 3. Changes in Infant Weight Before and After BLW Intervention

| Infant Weight | Group | | P-value |
|---|---|---|---|
| | Pretest (kg) | Posttest (kg) | |
| $\bar{x}$ (SD) | 9.53 (1.09) | 10.05 (1.14) | 0,000* |
| Median | 9.4 | 10 | |
| Rentang | 7.6-12 | 8.2-12.8 | |

* paired t-test analysis

The results of the study showed an increase in infant weight following the 14-day Baby-Led Weaning (BLW) intervention. The mean weight before the intervention was 9.53 ± 1.09 kg, which increased to 10.05 ± 1.14 kg after the intervention. A paired t-test analysis indicated a statistically significant difference in infant weight before and after the BLW intervention ($p = 0.000$, $p < 0.05$). A more detailed explanation of the paired samples t-test results is presented below.

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Table 4. The Paired Samples T-Test Analysis

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| **Weight Before BLW - Weight After BLW** | -.51733 | .20752 | .05358 | -.63225 | -.40241 | -9.655 | 14 | .000 |

Based on Table 4, the mean difference in weight before and after the BLW intervention is -0.51733 kg, indicating an average weight gain of 0.517 kg after the intervention (since the format is: weight before – weight after). The standard deviation of the difference is 0.20752, with a standard error of the mean of 0.05358, suggesting relatively low variation in weight change among participants. The 95% confidence interval for the weight difference ranges from -0.63225 to -0.40241, meaning we can be fairly confident that the average weight gain falls within this range and does not cross zero. This strengthens the finding that the observed change is unlikely to be due to chance. The calculated t-value is -9.655 with degrees of freedom (df) = 14, indicating that the difference between the two measurement points is statistically significant. The boxplot illustrates a general increase in the median infant weight following the BLW intervention, as depicted in the figure below.

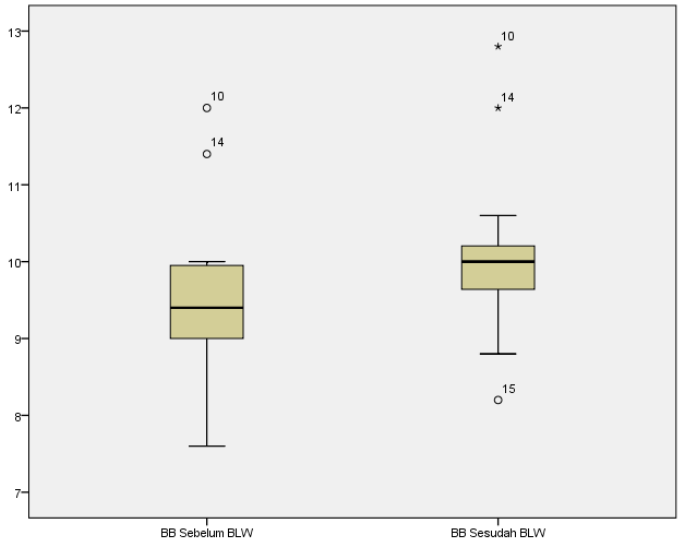


Figure 1. Boxplot comparison of infant weight before and after BLW intervention

The plot illustrates an overall increase in median weight following the intervention. Although a few outliers were identified in both groups, the distribution of weight after BLW shows a shift toward higher values, indicating improved nutritional outcomes. The data also display reduced lower-bound variability post-intervention, suggesting more consistent weight gain among participants. These visual findings align with the paired t-test results, which confirmed a statistically significant increase in infant weight after the BLW approach was applied.

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## DISCUSSION

Baby-Led Weaning (BLW) is an alternative complementary feeding approach that allows infants to self-feed from the beginning of solid food introduction (Gomez et al., 2020). Unlike traditional spoon-feeding, BLW encourages infants to eat independently using their hands, exploring various textures and food types according to their readiness and developmental stage. This method fosters self-regulation, motor coordination, and oral-motor skills, which are essential for healthy eating behaviors (Swanson et al., 2025). The autonomy granted to infants in BLW aligns with responsive feeding practices recommended by WHO, as it respects the child's hunger and satiety cues (WHO, 2023). Considering these benefits, the authors believe that the BLW method is highly relevant for infants who have demonstrated readiness for self-feeding.

The age distribution of the infants in this study ranged from 9 to 24 months, with the largest proportion found in the 17–20-month group (33.3%). This age group is developmentally positioned in a stage of increased mobility and curiosity, which may enhance their interest in self-feeding and diverse food textures, two key aspects of the BLW method. Infants in this range may have more developed oral-motor coordination, enabling more efficient chewing and food intake, potentially contributing to better nutritional outcomes (Avena, 2018). Conversely, younger infants aged 9–12 months may still be adapting to solid foods and fine motor skills, which could limit their intake despite BLW implementation (Campeau et al., 2021). These developmental variations across age groups may influence the degree of weight gain observed during the intervention, suggesting that the effectiveness of BLW may increase as infants approach the later stages of the complementary feeding period.

According to Sigmund Freud, the oral stage is the first phase of his theory of human psychosexual development. This stage occurs between 0 and 18 months of age, during which the mouth serves as the primary center of pleasure and exploration for infants. The main erogenous zone is the mouth, with key activities including breastfeeding, sucking, biting, and putting objects into the mouth (Silverman, 2020). Psychologically, this stage provides a sense of security, comfort, and satisfaction. If an infant's needs are not adequately met during the oral stage, they may develop an oral fixation. In adulthood, this fixation can manifest as compulsive behaviors related to the mouth, such as smoking, nail-biting, overeating, or excessive talking (Ukulor, 2024). The Baby-Led Weaning (BLW) method indirectly supports development during the oral stage by giving infants the opportunity to explore food through their mouths, fostering a positive relationship with eating, and promoting autonomy and self-confidence early in the feeding process. By aligning with this critical developmental phase, BLW not only nurtures emotional and sensory growth but may also contribute to improved nutritional intake and healthy weight gain.

The results of this study showed a significant increase in infants' average weight after a 14-day BLW intervention. The average weight gain of 0.517 kg, suggests that BLW may positively influence short-term weight outcomes in infants aged 9–24 months.The findings of this study align with recent evidence demonstrating that infants following the BLW approach often experience greater increases in weight for age z‑scores compared to those following conventional spoon‑feeding (Matzeller et al., 2024). The narrow confidence interval and small standard error also reflect consistent results across participants, which strengthens the reliability of the observed effect. This supports previous research suggesting that BLW may promote more adequate energy and nutrient intake by encouraging infants to consume a broader variety of foods and eat according to their appetite (Wati et al., 2024). By introducing food in its natural form and allowing infants to

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feed themselves, BLW can enhance food acceptance and reduce feeding difficulties, which may positively impact weight gain and overall nutritional status, particularly in the 6–24-month critical window (Morison et al., 2016). The validity of BLW as a supplemental feeding technique that can promote healthy weight gain in the early stages of infancy is supported by these recent findings.

In evaluating the effectiveness of BLW on weight gain, it is also important to consider other influencing factors, such as the infant's sex, which may affect growth patterns. This study, the majority of participants were boys (60%). Sex-based differences may influence growth patterns, as boys generally have slightly higher energy requirements and metabolic rates compared to girls of the same age (Thompson, 2021). These factors may contribute to greater weight gain in male infants following BLW interventions. Furthermore, boys are often more physically active, which could increase appetite and food intake (Freitas et al., 2018). However, further analysis is required to determine whether sex significantly influences the effectiveness of BLW on infant weight outcomes.

In addition to supporting weight gain, BLW has been associated with healthier eating patterns (Cox et al., 2024). Infants exposed to BLW tend to have a greater preference for fruits, vegetables, and whole foods compared to those fed using traditional spoon-feeding (Karagoz et al., 2024). These habits may persist into later childhood, potentially reducing the risk of obesity and chronic diseases. Furthermore, BLW may reduce mealtime battles and food neophobia (fear of new foods) by promoting positive associations with eating and encouraging infants to participate actively during meals (Watson et al., 2020). BLW presents a promising approach, but its safe and effective implementation depends on providing parents with practical guidance and support across various contexts.

Parents play a vital role in the successful implementation of the BLW method. They need to be educated on how to prepare age-appropriate foods, modify food textures, and apply strategies to prevent choking. The risk of choking may occur if foods are not prepared in accordance with the infant's oromotor abilities, such as offering pieces that are too large, hard textures, or a lack of supervision during meals (Fangupo, 2016). In addition, without proper guidance from parents, infants may not consume enough food to meet their growth and developmental needs (WHO, 2023). Health workers and community nutrition programs can incorporate BLW education into existing maternal and child health services. Structured support for parents, such as meal plans, cooking demonstrations, and peer support groups, can help promote safe, nutritious, and responsive feeding practices during the complementary feeding period.

This study was conducted on a small sample size and within a short intervention period, which may limit the generalizability of the findings. Additionally, dietary intake and parental practices were not monitored in detail, which could influence infant weight gain. However, the results still provide valuable insights into the potential of BLW in supporting healthy weight gain. With proper implementation and adequate supervision, this method may serve as an effective alternative in preventing malnutrition in infants.

## CONCLUSION

The findings of this study demonstrate that the Baby-Led Weaning (BLW) method can significantly contribute to weight gain in infants aged 9–24 months. By allowing infants to self-feed with a variety of nutritious, age-appropriate foods, BLW encourages the development of healthy eating habits, increases appetite, and supports adequate nutrient intake. The statistical analysis confirmed a significant difference in weight before and after the intervention, indicating that BLW is a promising approach to address early childhood malnutrition. As nutritional status in early life has long-term implications on growth, immunity, and cognitive development, implementing effective complementary feeding

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strategies is crucial. BLW, supported by parental education and close monitoring, can serve as a beneficial intervention in both clinical and community settings.

## RECOMMENDATIONS

Based on the findings of this study, it is recommended that the Baby-Led Weaning (BLW) method be introduced more broadly as an alternative approach to complementary feeding that supports healthy weight gain in infants, particularly those aged 9–24 months. To ensure its effectiveness, proper parental education is essential, especially regarding appropriate food selection, choking prevention, and regular growth monitoring. Furthermore, future studies with longer intervention periods and larger sample sizes are needed to evaluate the long-term impact of BLW on children's nutritional status and overall development. The BLW approach also holds promise for integration into nutritional education programs within both clinical settings and community-based health services, aiming to improve early childhood dietary practices.

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## REFERENCES

Avena, N. M. (2018). *What to Feed Your Baby and Toddler: A Month-by-Month Guide to Support Your Child's Health and Development*. Ten Speed Press.

Campeau, M., Philippe, S., Martini, R., & Fontaine-Bisson, B. (2021). The baby-led weaning method: a focus on mealtime behaviours, food acceptance and fine motor skills. *Nutrition Bulletin*, *46*(4), 476–485.

Correia, L., Sousa, A. R., Capitão, C., & Pedro, A. R. (2024). Complementary feeding approaches and risk of choking: A systematic review. *Journal of Pediatric Gastroenterology and Nutrition*, *79*(5), 934–942.

Cox, A. M., Taylor, R. W., Haszard, J. J., Beck, K. L., von Hurst, P. R., Conlon, C. A., Te Morenga, L. A., Daniels, L., McArthur, J., & Paul, R. (2024). Baby food pouches and Baby-Led Weaning: Associations with energy intake, eating behaviour and infant weight status. *Appetite*, *192*, 107121.

Dinkes, J. (2024). *Profil Kesehatan Kabupaten Jember Tahun 2023*.

Fangupo, L. J. (2016). *Does a 'baby-led'approach to complementary feeding alter the risk of choking and growth faltering in infants aged 0-12 months?* University of Otago.

Freitas, A., Albuquerque, G., Silva, C., & Oliveira, A. (2018). Appetite-related eating behaviours: an overview of assessment methods, determinants and effects on children's weight. *Annals of Nutrition and Metabolism*, *73*(1), 19–29.

Gomez, M. S., Novaes, A. P. T., Silva, J. P. da, Guerra, L. M., & Possobon, R. de F. (2020). Baby-led weaning, an overview of the new approach to food introduction: integrative literature review. *Revista Paulista de Pediatria*, *38*, e2018084.

Jayati, S. R. P. (2024). *Pengaruh Metode Baby Led Weaning terhadap Keterampilan Oral Motor pada Bayi 6-12 Bulan di Wilayah Kerja UPTD Puskesmas Peureulak Timur Tahun 2024*. Universitas Bina Bangsa Getsempena.

Karagoz, I., Bayram, S., Caliskan, H., & Yilmaz, C. S. (2024). Differences in eating behaviours and mothers attitudes between baby-led weaning vs. traditional spoon-feeding approaches in Turkiye. *Appetite*, *203*, 107720.

Lutter, C. K., Grummer-Strawn, L., & Rogers, L. (2021). Complementary feeding of

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ISSN: 2087 – 5002 | E-ISSN: 2549 – 371X
https://doi.org/10.34035/jk.v16i2.1852

infants and young children 6 to 23 months of age. *Nutrition Reviews*, *79*(8), 825–846.

Matzeller, K., Hernandez, M. L., Hendricks, A. E., Frank, D. N., Melanson, E., Krebs, N. F., & Tang, M. (2024). Infants Following Baby-Led Weaning Had Increased Growth Trajectories Compared to Conventional Weaning While Consuming Similar Energy. *Current Developments in Nutrition*, *8*. https://doi.org/10.1016/j.cdnut.2024.103012

Moideen, A., Ibadin, S. O., Alsubaie, N., Jacob, J., Bhutia, S. C., Abaid, T., Ishfaq, B., & Hidayatallah, Z. (2024). Exploring Essential Nutritional Guidelines For Optimal Growth And Development In Infants Aged 1 To 5 Years. *Frontiers in Health Informatics*, *13*(6).

Morison, B. J., Taylor, R. W., Haszard, J. J., Schramm, C. J., Erickson, L. W., Fangupo, L. J., Fleming, E. A., Luciano, A., & Heath, A.-L. M. (2016). How different are baby-led weaning and conventional complementary feeding? A cross-sectional study of infants aged 6–8 months. *BMJ Open*, *6*(5), e010665.

Neves, F. S., Campos, A. A. L., & Pereira Netto, M. (2018). The baby-led weaning method (BLW) in the context of complementary feeding: a review. *Revista Paulista de Pediatria*, *36*, 353–363.

Ripton, N., & Potock, M. (2016). *Baby Self-Feeding: Solutions for Introducing Purees and Solids to Create Lifelong, Healthy Eating Habits*. Fair Winds Press (MA).

Silverman, D. K. (2020). Psychosexual stages of development (Freud). In *Encyclopedia of personality and individual differences* (pp. 4192–4195). Springer.

Soliman, A., De Sanctis, V., Alaaraj, N., Ahmed, S., Alyafei, F., Hamed, N., & Soliman, N. (2021). Early and long-term consequences of nutritional stunting: From childhood to adulthood. *Acta Bio Medica: Atenei Parmensis*, *92*(1), e2021168.

Swanson, W. S., Ross, E. S., Matiz, L. A., Czerkies, L., Huss, L. R., Smith-Simpson, S., Bettler, J., & Pac, S. (2025). Essential elements for learning to eat: guidance to support families with infants and young children. *Frontiers in Pediatrics*, *13*, 1493780.

Thompson, A. L. (2021). Greater male vulnerability to stunting? Evaluating sex differences in growth, pathways and biocultural mechanisms. *Annals of Human Biology*, *48*(6), 466–473.

Ukulor, D. C. (2024). CRITICAL ANALYSIS OF SIGMUND FREUD'S THEORY ON EDUCATION. *BW Academic Journal*, 11.

UNICEF. (2020). the State of Children in Indonesia. In *The State of Children in Indonesia : Trends, Opportunities and Challenges for Realizing Children's Rights.* https://www.unicef.org/indonesia/sites/unicef.org.indonesia/files/2020-06/The-State-of-Children-in-Indonesia-2020.pdf

Wati, P. E. S., Dewi, A. A. N. T. N., Kamayoga, I. D. G. A., & Nugraha, M. H. S. (2024). Effect of complementary feeding using the baby-led weaning method on development in toddlers: A narrative review. *Kinesiology and Physiotherapy Comprehensive*, *3*(1), 16–22.

Watson, S., Costantini, C., & Clegg, M. E. (2020). The role of complementary feeding methods on early eating behaviors and food neophobia in toddlers. *Child Care in Practice*, *26*(1), 94–106.

WHO. (2019). *World health statistics 2019: monitoring health for the SDGs, sustainable development goals*. https://www.who.int/publications/i/item/9789241565707

WHO. (2023). *WHO Guideline for complementary feeding of infants and young children 6-23 months of age*. World Health Organization.

WHO. (2025). *Complementary feeding*. https://www.who.int/health-topics/complementary-feeding