

Community–Family Based Nutrition Education in Adolescent Nutritional and Reproductive Readiness as a Foundation for Adolescent Growth and Development

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ABSTRACT

Adolescence is a critical phase that determines future maternal and child health. Nutritional status and reproductive readiness during adolescence contribute to pregnancy outcomes and child growth and development. This study aimed to analyze the effect of Community–Family-Based Nutrition Education on adolescents' nutritional and reproductive readiness. A pre-experimental one-group pretest–posttest design was conducted among 40 adolescents aged 15–19 years selected using total sampling in the working area of Balowerti Community Health Center, Kediri City. The intervention involved structured nutrition and reproductive health education with family and community participation. Data were collected using structured questionnaires and analyzed using paired t-tests. The results showed significant improvements in nutritional readiness (64.2 ± 7.4 to 76.3 ± 6.1 ; $p = 0.001$) and reproductive readiness (67.8 ± 8.4 to 79.6 ± 7.2 ; $p = 0.001$). Community–Family-Based Nutrition Education effectively improves adolescents' nutritional and reproductive readiness and may serve as a promotive and preventive strategy to support optimal child growth and development.

I. Introduction

Adolescence is a critical transitional phase in the life cycle that plays a crucial role in laying the foundation for the health of future generations. Nutritional status and reproductive readiness during adolescence directly contribute to the quality of pregnancy, fetal growth and development, and future child health. Various studies show that nutritional problems in adolescents, such as anemia and micronutrient deficiencies, remain a public health challenge in many developing countries, including Indonesia (World Health Organization, 2020; Black, 2021) This situation has the potential to prolong the intergenerational cycle of nutritional problems and impact child developmental disorders.

In Indonesia, adolescent nutritional problems remain significant. The Indonesian Health Survey reported that anemia among adolescent girls and inadequate nutritional intake are still highly prevalent and contribute to future maternal and child health risks (Ministry of Health Republic of Indonesia, 2023). These conditions indicate the importance of early promotive and preventive interventions targeting adolescents.

Promotive and preventive approaches through nutrition education for adolescents are increasingly viewed as effective strategies from a life course perspective. Nutrition education not only aims to increase knowledge but also fosters adolescents' nutritional and reproductive preparedness as future parents (Victora, C. G., 2021). However, individualized and school-based education alone is considered insufficient in generating sustainable behavioral change. Family and community involvement are key



factors in strengthening the internalization of nutrition and reproductive health messages among adolescents (Rachmi, R. A., Agho, L., Li, M., & Baur, 2022).

The community-family-based nutrition education model has emerged as a cutting-edge approach that integrates the roles of family and community in adolescent nutrition interventions. The family serves as the immediate environment in shaping dietary patterns and health attitudes, while the community plays a role in creating conducive social norms and support (Nguyen, P. H., Scott, L., Avula, T., Tran, L. M., & Menon, 2020). This approach is considered relevant in the context of primary healthcare services and community-based programs, including community health centers (Puskesmas). Recent research has shown that nutrition education interventions that simultaneously involve families and communities are more effective in improving adolescent nutritional readiness and reproductive health than conventional approaches (Lassi, Z. A., Das, J. K., Salam, A., Bhutta, Z. A., 2023).

However, studies specifically linking community-based nutrition education to adolescent reproductive and nutritional readiness as a foundation for child growth and development are still limited, particularly in the context of primary health care in Indonesia. Therefore, this study is crucial to analyze the role of family- and community-based nutrition education approaches in building adolescent reproductive and nutritional readiness as a long-term preventive measure to support optimal child growth and development. The results of this study are expected to serve as a basis for strengthening the role of midwives in community-based promotive and preventive services and support the achievement of the vision of developing nationally competitive midwifery.

The novelty of this study lies in the integration of family and community involvement within nutrition education to simultaneously improve adolescents' nutritional and reproductive readiness as a foundation for future child growth and development in the primary healthcare setting.

II. Methods

This study was a quantitative pre-experimental design using a one-group pretest–posttest model. This design was used to analyze changes in adolescent reproductive and nutritional readiness before and after a community–family-based nutrition education intervention. This design was chosen because it is appropriate for community-based research with a limited sample size and aims to evaluate the effectiveness of educational interventions.

The study was conducted in the Balowerti Community Health Center (Puskesmas) working area in Kediri City, East Java, in December 2025, an area with community-based adolescent health services. The population in this study was all adolescents within the Balowerti Community Health Center working area. The study sample consisted of 40 adolescents, selected using a total sampling technique, considering affordability and suitability with existing community activities.

The intervention provided was community-family-based nutrition education, which involved adolescents, families, and community members on balanced nutrition and reproductive health. The education was structured through material delivery, interactive discussions, and strengthening the family's role in supporting adolescents' dietary patterns and reproductive readiness. The educational materials covered the concept of balanced nutrition for adolescents, anemia prevention, reproductive readiness, and the role of the family in shaping nutritional and health behaviors.

Data collection was conducted using a structured questionnaire adapted to the research objectives. The nutritional readiness questionnaire consisted of 20 items, while the reproductive readiness questionnaire consisted of 18 items. The instruments were tested for validity and reliability prior to data collection, with Cronbach's alpha values of 0.82 and 0.85 respectively. The questionnaire was used to measure adolescents' reproductive and nutritional readiness, assessed through pre- and post-intervention scores. Supporting data, including respondent characteristics, was also collected to provide a general overview of the research subjects.

Data analysis was conducted in stages. Descriptive analysis was used to describe respondent characteristics and the distribution of adolescent reproductive and nutritional readiness scores. Data normality was tested using the Shapiro–Wilk test and showed normal distribution ($p > 0.05$). Therefore, differences in scores before and after the intervention were analyzed using paired t-tests with a significance level of 95% ($\alpha = 0.05$).

III. Results and Discussion

Respondent Characteristics

This study involved 40 adolescents within the Balowerti Community Health Center (Puskesmas) in Kediri City. Based on age characteristics, the majority of respondents (65%) were between the ages of 15 and 17, while the remainder (35%) were between the ages of 18 and 19. In terms of gender, the majority were female adolescents (70%), while 30% were male adolescents. Based on education level, the majority of respondents (72.5%) were still in high school or equivalent, with the remainder either being junior high school students or having graduated from high school. These characteristics reflect a group of adolescents in the final phase of growth and beginning to enter reproductive readiness, making them relevant targets for family- and community-based nutrition education interventions.

These characteristics indicate that respondents are in the mid- to late-adolescent developmental phase, which theoretically represents a strategic period for nutritional and reproductive health interventions. During this phase, adolescents begin to develop eating patterns, health attitudes, and biological and psychosocial readiness, which influence reproductive health and their role as future parents (World Health Organization, 2020; Victora, 2021).

Changes in Adolescent Reproductive and Nutritional Readiness

The analysis results show an increase in the mean scores for adolescent reproductive and nutritional readiness after the community-based nutrition education intervention. This increase reflects that education involving the role of family and community can strengthen adolescents' understanding, attitudes, and readiness regarding nutrition and reproductive health.

Table 1. Mean Scores for Adolescent Reproductive and Nutritional Readiness Before and After the Intervention (n = 40)

Variable	Before Intervention (Mean ± SD)	After Intervention (Mean ± SD)	p-value
Nutritional Readiness	64,2 ± 7,4	76,3 ± 6,1	0,001
Reproductive Readiness	67,8 ± 8,4	79,6 ± 7,2	0,001

Source: Primary research data, 2025

The analysis showed an increase in the average nutritional readiness score from 64.2 to 76.3, with the majority of respondents (72.5%) experiencing an increase in the nutritional readiness category after the intervention. Similarly, for reproductive readiness, the average score increased from 67.8 to 79.6, with 70% of respondents in the high readiness category after the intervention. Statistical tests showed a significant difference ($p < 0.001$). This improvement demonstrates that a nutrition education approach involving families and communities can strengthen adolescents' understanding not only of nutritional intake but also of reproductive readiness, which underpins children's future growth and development. These findings align with the life course approach, which emphasizes the importance of interventions from adolescence to break the intergenerational cycle of nutritional problems (Prentice, 2021; Victora, 2021).

IV. Discussions

The community-family-based nutrition education approach demonstrated significant effectiveness because it actively engages the two social environments that most strongly influence adolescents' daily behaviors and decision-making processes. Adolescence is a critical developmental stage during which dietary patterns, health beliefs, and lifestyle habits are established and often persist into adulthood. Within

this context, families serve as the primary source of nutritional information, emotional support, and behavioral modeling. Parents and other family members influence food selection, meal patterns, and health-related attitudes through both direct guidance and everyday practices. At the same time, communities contribute to shaping social norms, collective expectations, and peer influences that can either encourage or discourage healthy behaviors. By simultaneously targeting both family and community contexts, nutrition education interventions create a supportive ecosystem that reinforces key health messages across multiple levels of adolescents' social environments. This multidimensional support increases the likelihood that adolescents will adopt and sustain positive nutritional and reproductive health behaviors. These findings are consistent with those reported by Nguyen et al., who found that interventions involving both family and community stakeholders produced stronger improvements in adolescent nutritional status, dietary diversity, and health-related behaviors than interventions targeting individuals alone. The authors emphasized that coordinated support from families and communities creates a synergistic effect that facilitates sustainable behavioral change and promotes healthier developmental trajectories among adolescents (Nguyen, P. H., Scott, L., Avula, T., Tran, L. M., & Menon, 2020).

These findings can also be understood through the perspective of Life Course Theory, which posits that experiences and exposures during critical developmental periods have long-lasting consequences for health and well-being across the lifespan. Adolescence represents a particularly important window of opportunity because biological growth, cognitive development, and social transitions occur simultaneously during this stage. Investments in nutrition and reproductive health education during adolescence therefore have the potential to influence future maternal health, pregnancy outcomes, and child development. According to Life Course Theory, improving adolescents' nutritional readiness before they enter reproductive age can interrupt intergenerational cycles of malnutrition and poor health outcomes. Furthermore, Social Support Theory provides an additional explanation for the effectiveness of the intervention. This theory suggests that behavioral change is more likely to occur and be maintained when individuals receive emotional, informational, and practical support from their social networks. Family members can provide encouragement, monitoring, and resources necessary for healthy eating and reproductive health practices, while community members and peer groups reinforce these behaviors through social acceptance and collective participation. Consequently, adolescents who receive consistent support from both family and community environments are more likely to develop positive attitudes, stronger self-efficacy, and greater commitment to maintaining healthy nutritional and reproductive behaviors. These mechanisms help explain the observed improvements in adolescent readiness and are supported by previous studies highlighting the critical role of social support in promoting adolescent health outcomes (Baird, S., Friedman, J., & Schady, 2020; Darmstadt, N. A., Kinney, M., & Sweet, 2021; Nguyen, P. H., Scott, L., Avula, T., Tran, L. M., & Menon, 2020; Victora, C. G., 2021).

The results of this study are also consistent with a growing body of evidence demonstrating the effectiveness of community- and family-based interventions for adolescent nutrition and health promotion. A systematic review conducted by Zohra A. Lassi and colleagues reported that interventions involving family engagement, community participation, and locally adapted educational strategies produced significant improvements in adolescents' nutritional knowledge, attitudes, dietary practices, and preparedness for healthy future pregnancies compared with conventional health education approaches. These findings suggest that educational interventions are more effective when they move beyond individual-level knowledge transfer and incorporate the broader social determinants of health that shape behavior. Similarly, a national study conducted by Rina Agustina Rachmi and colleagues highlighted the importance of family and social environments in determining dietary quality and health behaviors among Indonesian adolescents. Their findings demonstrated that family influence, household practices, cultural norms, and social interactions significantly affect adolescents' nutritional choices and health outcomes. Therefore, interventions that integrate family engagement and community participation are particularly relevant in the Indonesian context, where collective values and strong family relationships continue to play a central role in shaping adolescent behavior. The consistency between the present findings and previous research strengthens the evidence supporting family- and community-based strategies as effective and sustainable approaches for improving adolescent nutritional and reproductive readiness (Lassi, Z. A., Das, J. K., Salam, A., Bhutta, Z. A., 2023; Rachmi, R. A., Agho, L., Li, M., & Baur, 2022).

The improvements in adolescent nutritional and reproductive readiness observed in this study have important implications that extend beyond adolescence and into future generations. Adequate nutrition and reproductive health preparedness during the preconception period are increasingly recognized as critical determinants of maternal health, pregnancy outcomes, fetal development, and child growth. Adolescents who enter adulthood with sufficient nutritional knowledge, healthy dietary practices, and an understanding of reproductive health are more likely to experience healthy pregnancies and provide optimal care for their future children. Evidence suggests that maternal nutritional status before conception affects placental function, fetal growth, birth outcomes, and the risk of chronic diseases later in life. Furthermore, reproductive readiness contributes to informed decision-making regarding family planning, pregnancy timing, and maternal healthcare utilization. By strengthening nutritional and reproductive preparedness during adolescence, family- and community-based interventions may help reduce the risk of low birth weight, stunting, and developmental delays in future offspring. Thus, the benefits of such interventions are not limited to the immediate target population but may also contribute to breaking the intergenerational cycle of malnutrition and poor health. In this regard, adolescent-focused interventions should be viewed as strategic long-term investments in human capital development and sustainable public health improvement (Baird, S., Friedman, J., & Schady, 2020; Black, R. E., 2021). Therefore, interventions for adolescents through family- and community-based approaches can be viewed as a preventive strategy that supports the optimization of child growth and development in a sustainable manner.

These findings also reinforce the strategic role of midwives in delivering community-based promotive and preventive health services, particularly within primary healthcare settings. Midwives are uniquely positioned to serve as educators, counselors, advocates, and facilitators who bridge healthcare systems with families and communities. Their close interaction with community members enables them to identify local health needs, mobilize community participation, and provide culturally appropriate health education. The success of the family- and community-based approach demonstrated in this study highlights the importance of expanding the role of midwives beyond clinical care to include community empowerment and health promotion activities. Such an approach aligns with current adolescent health service policies implemented through community health centers, which emphasize preventive interventions, community engagement, and life-course approaches to health promotion. Furthermore, strengthening the involvement of midwives in adolescent nutrition and reproductive health programs supports broader national goals of improving maternal and child health outcomes and reducing the burden of malnutrition. This integrated model of care also reflects the evolving vision of the midwifery profession, which increasingly focuses on fostering healthy families and enhancing the quality of life of future generations through comprehensive, community-centered health services (Ministry of Health of the Republic of Indonesia, 2022; Darmstadt, N. A., Kinney, M., & Sweet, 2021).

This study has several limitations, including the absence of a control group and the relatively small sample size. In addition, the study was conducted in only one primary healthcare area, limiting the generalizability of findings. Future studies using randomized controlled designs and larger samples are recommended.

V. Conclusion

Community–Family-Based Nutrition Education effectively improves adolescent nutritional and reproductive readiness. This approach strengthens the role of families and communities in establishing the foundation for child growth and development through promotive and preventive interventions starting in adolescence. This model is relevant for application in community-based primary healthcare and supports the role of midwifery in improving the quality of life for future generations.

VI. References

- Baird, S., Friedman, J., & Schady, N. (2020). Adolescent nutrition and intergenerational health outcomes. *World Development*, 127, 104734.
<https://doi.org/https://doi.org/10.1016/j.worlddev.2019.104734>

- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R.A., Christian, P., de Onis, M., Ezzati, M, R. (2021). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 397(10272), 137–150. [https://doi.org/https://doi.org/10.1016/S0140-6736\(20\)32375-9](https://doi.org/https://doi.org/10.1016/S0140-6736(20)32375-9)
- Darmstadt, N. A., Kinney, M., & Sweet, L. (2021). Family-centered approaches to improve maternal and child health outcomes. *Global Health: Science and Practice*, 9(2), 306–320. <https://doi.org/https://doi.org/10.9745/GHSP-D-20-00567>
- Lassi, Z. A., Das, J. K., Salam, A., Bhutta, Z. A., & others. (2023). Interventions targeting adolescent nutrition: A systematic review. *Nutrients*, 15(4), 1021. <https://doi.org/https://doi.org/10.3390/nu15041021>
- Ministry of Health Republic of Indonesia. (2022). Guidelines for adolescent health services in primary health care. Ministry of Health Republic of Indonesia.
- Ministry of Health Republic of Indonesia. (2023). Indonesian health survey 2023. Ministry of Health Republic of Indonesia.
- Ministry of Health Republic of Indonesia. (2023). National report on adolescent health and nutrition. Ministry of Health Republic of Indonesia.
- Nguyen, P. H., Scott, L., Avula, T., Tran, L. M., & Menon, P. (2020). The role of family and community in improving adolescent nutrition. *Maternal & Child Nutrition*, 16(2), e12932. <https://doi.org/https://doi.org/10.1111/mcn.12932>
- Prentice, A. M., Ward, A., Goldberg, G., Jarjou, L., Moore, S. E., Fulford, A., & Prentice, A. (2021). Critical windows for nutritional interventions against stunting. *The American Journal of Clinical Nutrition*, 113(4), 887–900. <https://doi.org/https://doi.org/10.1093/ajcn/nqaa389>
- Rachmi, R. A., Agho, L., Li, M., & Baur, L. A. (2022). Adolescent nutrition in Indonesia: Current evidence and future directions. *Public Health Nutrition*, 25(5), 1231–1242. <https://doi.org/https://doi.org/10.1017/S1368980021005123>
- Victora, C. G., Christian, P., Vdaletti, L. P., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2021). Revisiting maternal and child undernutrition in low-income and middle-income countries: Variable progress towards an unfinished agenda. *The Lancet*, 397(10282), 1388–1399. [https://doi.org/https://doi.org/10.1016/S0140-6736\(21\)00394-9](https://doi.org/https://doi.org/10.1016/S0140-6736(21)00394-9)
- World Health Organization. (2020). Adolescent nutrition: A review of the situation in low- and middle-income countries. World Health Organization.