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The Role of Peer Education in Adolescent Girls for Stunting Prevention: A Scoping Review

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ABSTRACT

Background: Stunting remains a major public health problem with long-term consequences for physical growth, cognitive development, and future productivity. Prevention efforts should begin before pregnancy, particularly during adolescence, as adolescent girls are vulnerable to anemia and may enter pregnancy with inadequate nutritional status. Although peer education is widely used in adolescent health promotion, evidence regarding its contribution to stunting prevention remains fragmented.

Methods: This scoping review followed the PRISMA-ScR guideline to map evidence on the role of peer education in improving knowledge, attitudes, and behaviors related to stunting prevention among adolescent girls. The review was guided by the PCC framework, with adolescent girls as the population, peer education as the concept, and stunting prevention as the context. Literature searches were conducted in PubMed, ScienceDirect, Wiley Online Library, and Google Scholar. Studies published between 2016 and 2025 were screened using predefined inclusion and exclusion criteria, and eligible articles were synthesized narratively.

Results: A total of 1,931 records were identified, of which 13 studies met the inclusion criteria. Five major themes emerged: educational media for nutrition and stunting prevention, effects of peer education on knowledge-attitude-behavior outcomes, adherence to Fe/IFA supplementation, social and environmental support, and implementation challenges. Overall, peer education demonstrated positive effects on nutritional literacy, anemia-related knowledge, preventive attitudes, and health-promoting behaviors, particularly adherence to iron supplementation. However, intervention effectiveness was influenced by teacher support, parental involvement, peer interaction, and program sustainability.

Conclusion: Peer education is a promising strategy for adolescent-based stunting prevention because it strengthens knowledge, attitudes, and preventive behaviors through socially relevant communication. Its effectiveness may be enhanced when integrated into school health programs, aligned with supplementation initiatives, and supported by continuous monitoring from schools and families.

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INTRODUCTION

Stunting is a persistent global nutritional problem that undermines overall health and the development of human capital. This condition results from chronic nutritional deficiencies and recurrent infections, particularly during the first 1,000 days of life, a critical period for optimal growth and development. In 2023, an estimated 148.1 million children under five representing about 22.3% globally were reported to experience stunting (UNICEF et al., 2023). Although the prevalence has gradually declined, progress remains uneven, particularly in developing countries (Kassebaum, 2024). In Indonesia, the prevalence of stunting decreased from 24.4% in 2021 to 19.8% in 2024, but remains above the national target of 14% in the 2025-2029 RPJMN (Ministry of Health of the Republic of Indonesia, 2025) . Beyond impaired physical growth, stunting is associated with suboptimal cognitive development, increased risk of chronic disease, and reduced productivity in adulthood (Daracantika et al., 2021) (Purwanti et al ., 2025). Stunting prevention needs to begin in adolescence, especially in adolescent girls who are vulnerable to anemia due to increased iron needs and menstruation. WHO reports the global prevalence of anemia in women aged 15–49 years at 30.7%, with Southeast Asia as the highest region (46.4%) (World Health Organization, 2025) . Anemia in adolescent girls increases the risk of pregnancy with poor nutritional status and stunting in the next generation (Dewi et al., 2022).

Various strategies have been implemented to prevent stunting since adolescence, especially through education nutrition , supplementation substance iron , and promoting healthy lifestyle habits. One of the main interventions is the Iron Supplement (IBF) and iron-folic acid (IFA) supplementation program, which aims to reduce anemia in adolescent girls (Prasetya et al ., 2022) . However, adherence to IBF consumption remains low due to side effects, an unacceptable taste, and minimal motivation and environmental support (Tabita et al ., 2023) . In promoting adolescent health, a more participatory educational approach is increasingly needed. Peer education is one widely used method, which involves the delivery of health messages by trained peers (Sahi et al ., 2023) . This approach is considered effective because adolescents are more receptive to information from the same social group, which can strengthen social support and encourage behavior change (Slagter et al ., 2023) .

Several studies have shown that peer education can improve adolescents' knowledge and attitudes regarding anemia and balanced nutritional behavior as part of stunting prevention (Othman et al ., 2023) . Furthermore, health education has been developed through social media, pocket books, and audiovisuals, which have been shown to improve nutritional literacy in adolescents (Simanjuntak et al ., 2022) . Simple media such as pocket books are also effective in strengthening the understanding of anemia as a risk factor for stunting (Damayanti et al ., 2025). The use of audiovisual media has also been reported to increase adolescents' knowledge regarding the 1000 HPK (1000 HPK) (Sunaeni et al ., 2022) . In addition to education, supporting programs such as Free Nutritious Meals (MBG) have begun to be introduced. For repair intake substance nutrition adolescents and school children (Wiranata et al ., 2025) . However, the success of this program still faces challenges in terms of implementation and sustainability (Nurulaini & Afifah, 2025) .

Various studies have discussed efforts to prevent stunting from adolescence through education. nutrition and supplementation substance iron . However, most studies still focus more on increasing knowledge, while changing adolescent attitudes and behaviors has not always been a primary focus (Simanjuntak et al ., 2022) . Peer education has been reported to improve adolescent girls' understanding of anemia and the importance of consuming iron tablets, but evidence specifically assessing its impact on stunting prevention behavior is still limited (Othman et al ., 2023) . On the other hand, adolescent compliance in consuming iron tablets remains an issue because it is influenced by environmental support, personal motivation, and trust in health information sources (Tabita et al ., 2023) .

Some educational interventions are still one-way, such as counseling or the use of print media, so the active involvement of peers as agents of change has not been optimally utilized (Damayanti et al ., 2025) . In addition, nutrition programs such as the Free Nutritious Meal Program are starting to develop as a supporting strategy, but studies linking them to a peer education approach are still rare (Wiranata et al ., 2025) . Differences in research design, intervention methods, and variations in measured outcomes also make the available evidence difficult to draw comprehensive conclusions (Slagter et al ., 2023) . Therefore, a broader literature mapping is needed to understand the extent to which peer education plays a role in shaping adolescents' knowledge, attitudes, and behaviors in stunting prevention.

Adolescence is a strategic period in breaking the intergenerational cycle of stunting because the nutritional status of adolescent girls will influence reproductive health and the risk of stunting in the next generation (Dewi et al ., 2022) . Therefore, interventions from adolescence, particularly through anemia prevention and increased nutritional literacy, are strategic steps to break the intergenerational cycle of stunting. (World Health Organization, 2025). Peer education is increasingly used in adolescent health promotion because this approach allows the delivery of nutrition and health messages through peers who are more socially and emotionally close (Sahi et al ., 2023) . This approach is considered effective in building social support and encouraging more sustainable behavior change than one-way education (Slagter et al ., 2023) .

However, scientific evidence regarding the role of peer education in stunting prevention is still scattered, with variations in interventions and outcomes measured across studies (Othman et al ., 2023) . Furthermore, compliance teenager to supplementation substance iron remains a challenge influenced by environmental factors and trust in health information (Tabita et al ., 2023). This situation indicates the need for a broader literature mapping to understand the scope of interventions that have been implemented and research gaps that still need to be developed.

Therefore, there is still no clear scoping review-based mapping that specifically explains how peer education contributes to stunting prevention among adolescent girls across knowledge, attitude, and behavior domains. A scoping review is appropriate for this topic because it allows a broad mapping of concepts, intervention characteristics, outcome patterns, and research gaps. This review aims to map the scientific evidence on the role of peer education in improving the knowledge, attitudes, and behaviors of adolescent girls in relation to stunting prevention, and to identify areas that require further research and program development.

METHOD

Research Design

This study used a scoping review design to map the available scientific evidence on the role of peer education in improving adolescent girls' knowledge, attitudes, and behaviors related to stunting prevention. The review was conducted in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guideline. The review process included identification of the review question, development of eligibility criteria, systematic searching, study screening, data charting, and narrative synthesis of findings

Population and Sample

The search strategy was developed using the PCC framework (Population, Concept, Context). The Population consisted of adolescent girls; the Concept focused on peer education; and the Context centered on stunting prevention efforts. These elements guided the construction of search keywords and the selection of relevant literature, which was summarized in Table 1: "The Role of Peer Education on Adolescents' Knowledge, Attitudes, and Behavior in Stunting Prevention."

Table 1. PCC *Framework*

P (Population)	C (Concept)	C (Context)
Teenage girls	Peer education in improving knowledge, attitudes, and behavior	Stunting prevention and nutritional health promotion

A systematic literature search was conducted between January 2016 and December 2025. The literature search was conducted using four data sources, consisting of three major databases, namely PubMed, ScienceDirect, and Wiley Online Library, as well as one academic search engine, Google Scholar. Specific keywords are listed in Table 2. Keywords.

The search for articles using keywords used was limited to (*"peer education" OR "peer-led intervention" OR "peer support" OR "peer educator") AND ("adolescent girls" OR "female adolescents" OR teenagers OR youth) AND ("stunting prevention" OR "stunting" OR "nutrition education" OR "anemia prevention" OR "iron supplementation" OR "iron folic acid" OR IFA) AND ("knowledge" OR "attitude" OR "behavior" OR "health behavior"*)Keywords were specifically used in each database.

The inclusion and exclusion criteria used in this review are as follows:

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Full text and open access articles. Relevant articles that discuss " The Role of Peer Education on Adolescent Knowledge, Attitudes, and Behavior in Preventing Stunting ". Articles from the last 10 years published between 2016 and 2025 Articles published in English Primary research or *original articles , book reviews/* article reviews	Editorial articles, opinions, comments or articles that are not the result of original research. Publication manuscript

Procedures and if relevant, the time frame:

The literature search was carried out from January 2016 to December 2025. The literature search was conducted using four data sources, consisting of three major databases, namely PubMed, ScienceDirect, and Wiley Online Library, as well as one academic search engine, Google Scholar. The article selection process included title and abstract screening, full-text evaluation, and data extraction. Two reviewers conducted the screening independently, with a third reviewer consulted when disagreements occurred. From the 1,931 articles initially identified, 13 met the inclusion criteria and were included in the final analysis. A PRISMA Flow Chart was used to provide a systematic visualization of the study selection process.

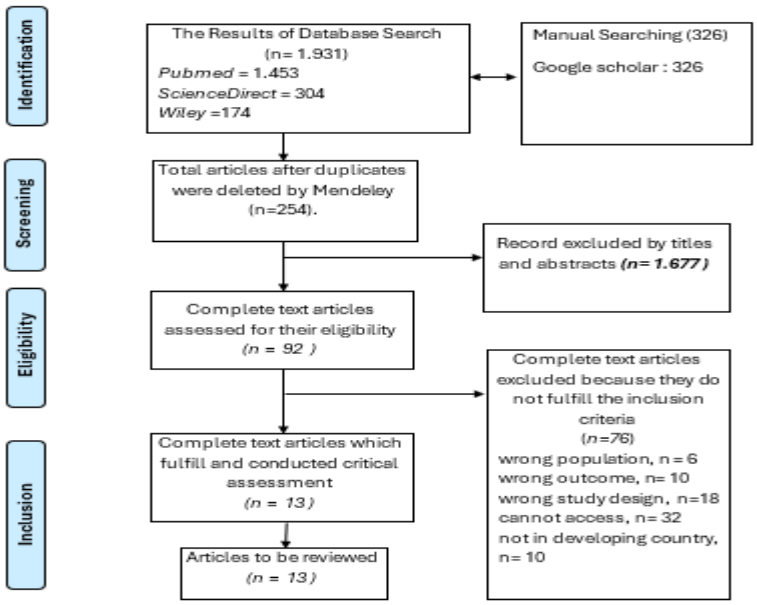

Figure 1. PRISMA Diagram

Analysis Plan

Data were extracted using a structured charting table that included the following elements: author, year of publication, country, study design, type of intervention, measured outcomes, and key findings. The extracted data were then synthesized narratively and organized into major themes, including nutrition education media, the impact of peer education, adherence to iron (Fe) and iron–folic acid (IFA) supplementation, as well as social support factors and challenges in implementing nutrition programs.

Scope and/or Methodological Limitations

This scoping review has several limitations, including the restriction to open-access and English-language publications, which may have excluded relevant studies published in other languages or not freely accessible. Additionally, variations in research design across the included studies limited the ability to conduct quantitative comparisons, such as a meta-analysis. A critical appraisal using the Joanna Briggs Institute (JBI) assessment tools was performed to provide an overview of the methodological quality of the included studies.

RESULTS AND DISCUSSION

Results

Of the 1,931 records identified through database and manual searching, 13 studies met the inclusion criteria and were included in the review. Most studies were conducted in Indonesia, with only a small number originating from India and Ghana. The included evidence consisted of quantitative, qualitative, mixed-methods, and community-based research designs, indicating that the topic has been explored through multiple methodological approaches but remains concentrated in a limited geographical context.

The reviewed studies can be grouped into five interrelated themes. First, several studies examined educational media used to support adolescent nutrition and stunting prevention, including social media, pocket books, audiovisual media, school counseling, and community-based education. These studies generally reported improvements in knowledge and understanding of anemia, nutrition, and stunting prevention, suggesting that educational delivery format influences engagement and information uptake.

Second, the evidence showed that peer education contributes to improvements in adolescent knowledge, more favorable health attitudes, and healthier preventive behaviors. Positive outcomes were especially evident in studies that linked peer interaction with discussions on anemia, balanced nutrition, and iron tablet consumption. This indicates that peer education does not function only as information transfer, but also as a social mechanism that supports internalization of health messages.

Third, adherence to Fe supplementation emerged as a recurring outcome. The review showed that compliance was affected not only by knowledge but also by awareness of benefits, perceived barriers, teacher supervision, and consistency of program delivery. Thus, educational interventions appear to be more effective when combined with monitoring and supportive school systems.

Fourth, social and environmental support was a major enabling factor across studies. Parental encouragement, active teacher involvement, peer support, and trust in credible health information sources consistently shaped adolescent participation and adherence. These findings suggest that the success of peer education depends on the broader ecosystem in which adolescents receive and apply health information.

Fifth, the studies also highlighted implementation challenges in nutrition programs. Persistent misconceptions about stunting, limited facilities, logistical barriers, and the sustainability of nutrition programs such as free nutritious meals remained important obstacles. Together, these themes show that peer education has potential value, but its effectiveness is conditioned by program design, delivery context, and continuity of support. These thirteen articles have several characteristics, such as year of publication, country of origin, and research methods used (shown in table 3).

Table 3. Charting Data

No	Author	Country	Design	Intervention	Key Findings
1	(Simanjuntak et al ., 2022)	Indonesia	*Quantitative study/ Quasi-Experiment*	Social media-based nutrition education	Social media is effective in improving stunting prevention; TikTok predominantly increases knowledge, while Instagram shapes attitudes and behavior.
2	(Damayanti et al ., 2025)	Indonesia	*Community-Based Research (CBR)*	Anemia education through pocket books	The pocketbook improves understanding of anemia; mothers' misconception that stunting is solely a genetic factor remains high.
3	(Othman et al ., 2023)	Indonesia	*Quantitative, Pre-experiment (One Group Pretest-Posttest)*	Peer education and Fe supplementation	There has been a significant increase in knowledge and attitudes regarding the consumption of iron tablets (TTD).
4	(Tabita Et al ., 2023)	Indonesia	*Qualitative (in-depth interviews, cross-sectional)*	Social support and interpersonal trust	Compliance with TTD consumption is influenced by support from parents, teachers, peers, and trust in information sources.
5	(Putri Et al ., 2025)	Indonesia	*Qualitative, cross-sectional in-depth interviews*	Anemia health education	Knowledge of anemia and understanding of TTD increased significantly after education.
6	(Ansari et al ., 2021)	Indonesia	*Mixed-methods (sequential explainer)*	Reception IFA-based supplementation school	Compliance with IFA consumption is influenced by individual awareness and school environmental support.
7	(Gosdin Et al ., 2020)	Ghana	*Quantitative (longitudinal & cross-sectional)*	School-based IFA program	Compliance was 56%; distribution and teacher role were important factors in the program's success.

8	(Wangaskar Et al ., 2021)	India	*Quantitative (cross-sectional)*	WIFS program compliance	The prevalence of anemia is high; teacher supervision and education are needed to improve compliance.
9	(Syahputra et al ., 2024)	Indonesia	*Qualitative / Community-Based Research (CBR) (observation, interviews, action-based analysis of findings)*	Sustainable stunting education	Continuous education supports the government's program to reduce stunting rates in villages.
10	(Sunaeni Et al ., 2022)	Indonesia	Quantitative , Quasi-Experimental (pre - *post test* , audiovisual media)	Audiovisual education about 1000 HPK	Audiovisual media significantly increases adolescent girls' knowledge about 1000 HPK.
11	(Wiranata et al ., 2025)	Indonesia	Qualitative (in-depth interviews, participant observation, thematic analysis)	Free Nutritious Meal Program (MBG)	MBG improves student learning focus and attendance, but program distribution challenges remain.
12	(Nurulaini & Afifah, 2025)	Indonesia	Qualitative (in-depth interviews, observation, thematic analysis & triangulation)	Implementation of the MBG program	The program has a positive impact on nutrition and learning motivation; menu coordination and innovation are essential for sustainability.
13	(Azzahra et al ., 2025)	Indonesia	Qualitative (interviews, observation, documentation, reduction & thematic analysis)	MBG program trial	The program has had a positive impact on students' health and eating habits, but needs further evaluation.

Critical Appraisal

Based on the results of the critical appraisal using the Joanna Briggs Institute (JBI) tools, most of the analyzed studies reported key findings demonstrating that peer education plays a substantial role in improving adolescents' knowledge, attitudes, and behaviors related to stunting prevention. These improvements occur particularly through peer-support mechanisms, increased motivation, and the delivery of nutrition messages that adolescents perceive as more relatable and acceptable. School-based interventions that incorporate structured peer education consistently emerge as an effective strategy for enhancing adolescents' understanding of balanced nutrition and promoting behaviors that help prevent stunting.

Table 4. Critical Appraisal of Included Studies (JBI-Based)

No	Author (Year)	Study Design	JBI Criteria Met (%)	Quality Level
1	Simanjuntak et al. (2022)	Quasi-experimental	82%	High
2	Damayanti et al. (2025)	Community-Based Research	78%	Moderate
3	Othman et al. (2023)	Pre-experimental	80%	High
4	Tabita et al. (2023)	Qualitative	75%	Moderate
5	Putri et al. (2025)	Qualitative	77%	Moderate
6	Ansari et al. (2021)	Mixed-methods	81%	High
7	Gosdin et al. (2020)	Quantitative	79%	Moderate
8	Wangaskar et al. (2021)	Cross-sectional	76%	Moderate
9	Syahputra et al. (2024)	Community-Based Research	74%	Moderate
10	Sunaeni et al. (2022)	Quasi-experimental	83%	High
11	Wiranata et al. (2025)	Qualitative	75%	Moderate
12	Nurulaini & Afifah (2025)	Qualitative	76%	Moderate
13	Azzahra et al. (2025)	Qualitative	74%	Moderate

The critical appraisal results indicate that most included studies were of moderate to high methodological quality. Studies classified as high quality generally demonstrated clear research design, appropriate methodology, and valid outcome measurements. Meanwhile, moderate-quality studies commonly showed limitations related to sample size, lack of control groups, or insufficient follow-up duration. No studies were categorized as low quality. These findings suggest that the overall evidence base is sufficiently robust to support the synthesis, although caution is needed when interpreting results due to methodological variability.

Table 5. Year Classification

No	Publication Year	Number of Articles
1	2020	1
2	2021	2
3	2022	2
4	2023	2
5	2024	1
6	2025	5
Total		13

Based on the table above, the reviewed articles were published between 2020 and 2025. The distribution includes one article from 2020, two articles published in 2021, two in 2022, two in 2023, one in 2024, and five articles published in 2025.

Table 6. Country Classification

No	Country	Number of Articles
1	Indonesia	11
2	India	1
3	Ghana	1
Total		13

Based on the table above, the reviewed articles originate from three countries. Specifically, eleven studies were conducted in Indonesia, one study was carried out in India, and one study originated from Ghana.

Table 7. Classification of Research Designs

No	Design	Number of Articles
1	Quantitative	6
2	Qualitative	4

3	Mixed-method	1
4	Community-Based Research (CBR)	2
Total		13

Based on the table above, the reviewed articles encompass four types of research methodologies. Specifically, the evidence consists of six quantitative studies, four qualitative studies, one mixed-methods study, and two community-based research (CBR) studies.

Table 8. Theme Analysis]

Theme	Sub-theme	Article Code
Educational Media on Nutrition and Stunting Prevention	Nutrition education through social media	A1
	Anemia education using pocket books	A2
	1000 HPK education using audiovisual media	A10
Environmental Support	Anemia education through counseling in schools	A5
	Community-based stunting prevention education	A9
The Impact of Peer Education on Knowledge, Attitudes, and Behavior	Increasing knowledge of anemia and stunting	A1, A3, A5, A10
	Changes in adolescent attitudes towards health	A1, A3
	Behavioral changes to prevent stunting	A1, A5
Compliance with Fe/IFA Tablet Supplementation	Level of compliance with consumption of Fe tablets	A3, A7, A8
	Acceptance of IFA supplementation program	A6
	The influence of individual awareness on compliance	A6, A8
The Role of Social and Environmental Support	Parental support	A4, A6
	Support from teachers and schools	A3, A4, A7
	Peer support	A3, A4
	Trust in health information sources	A4
Implementation and Challenges of Nutrition Programs	Misconceptions about stunting (genetic factors)	A2
	Limited health facilities and services	A2, A8
	Distribution and program implementation constraints	A7, A8
	Impact of the Free Nutritional Meal Program (MBG)	A11, A12, A13
	Challenges and sustainability of the MBG Program	A11, A12, A13

Summary of Key Results

Overall, the findings of this scoping review demonstrate that peer-based educational interventions help strengthen nutritional literacy among adolescent girls, promote positive attitudes toward preventing anemia and stunting, and encourage healthy practices such as consistent iron supplementation. Nonetheless, the effectiveness of these interventions is highly dependent on support from both the school environment and families, as well as the continuity and sustainability of adolescent health programs.

Discussion

Nutrition education through social media is effective in improving knowledge, attitudes, and behaviors for stunting prevention (A1). This is supported by research (Enciso et al ., 2024) , which shows that social media improves adolescent nutrition literacy due to its interactive nature and accessibility, and (Masri et al ., 2023) , which reports that Instagram and short videos strengthen adolescent nutrition understanding. However, (Gough et al.,2017) noted that despite increased knowledge, behavioral changes do not always occur without direct support. These findings emphasize the importance of combining online education with face-to-face approaches or monitoring for long-term results.

The results of Article 2 indicate that anemia education through a pocket book is effective in increasing adolescents' understanding of anemia as a risk factor for stunting. This finding is supported by (Mulyani et al ., 2025) and (Khairunisa et al ., 2025) , who stated that pocket books or simple printed media improve knowledge and attitudes because they are easy to read and understand. However, (Fayasari et al ., 2024) indicate that increased knowledge is not always followed by behavioral changes, so pocket books should be combined with discussions or direct counseling for optimal results.

According to Article 10, 1000 HPK education using audiovisual media is effective in increasing the knowledge of adolescent girls. (Kas & Darlis, 2024) stated that audiovisual media is

more effective than conventional lectures because it increases attention and memory. However, (Pratiwi et al ., 2024) showed that increased knowledge is not always followed by changes in attitudes and behavior without further discussion. This confirms that audiovisual media is most effective when used as an aid in interactive education.

Based on Article 5, anemia counseling in schools is effective in increasing students' knowledge in stunting prevention. This finding aligns with (Etrawati et al ., 2025) who emphasized schools as strategic locations for nutrition education (Husna et al ., 2025) added that teacher support and structured programs make school-based nutrition interventions more effective. However, Mulyani et al . (2020) indicated that single counseling sessions have limited impact, so interventions should be conducted routinely and integrated into school health programs. Based on Article 9, community-based education can increase awareness about stunting and efforts to reduce it. prevention . This finding aligns with (Sukmawati et al ., 2025) who stated that the involvement of integrated health post (Posyandu) cadres and families strengthens the effectiveness of education. They emphasized that a community approach is an important strategy in stunting prevention in developing countries. However, (Noor & Muniroh, 2023) show that The perception of stunting as a hereditary factor can be an obstacle, so education must be adapted to the local socio-cultural context.

Based on A1, A3, A5, and A10, health education has been shown to improve adolescents' knowledge about anemia and stunting. This is in line with findings (Sinaga et al ., 2025) , which show that direct education for adolescent girls significantly improves knowledge about anemia prevention. (Riyanto et al ., 2024) confirmed that education based Anemia screening and iron tablet administration are effective in increasing adolescents' understanding of stunting. However, (Dyna et al ., 2024) showed that education for healthy, anemia-free adolescents is still limited to increasing anemia knowledge without a comprehensive understanding of stunting.

Peer education effectively increases adolescent knowledge about nutrition, anemia, and stunting (Nurlaela & Rasmaniar, 2023) . Balanced nutrition training for adolescent girls as peer educators increases understanding of the importance of nutrition in preventing stunting, which can be transmitted to peers (Mandar et al., 2025) . Empowering adolescents through balanced nutrition peer educators in schools shows an increase in knowledge scores before and after the intervention (Awaliah et al., 2025) . The delivery of health information by peers is considered more easily accepted and remembered by adolescents (Akbar et al., 2022) .

Based on A1, A3, A5, and A10, health education has the potential to shape adolescents' positive attitudes toward health practices. This finding aligns with Yunanda et al .'s (2019) report that video-based education can improve adolescents' attitudes toward anemia prevention. However, Sari et al.'s (2024) report that using video media without attitude evaluation only results in increased knowledge without changing attitudes.Peer education shapes adolescents' more positive attitudes toward healthy nutritional behaviors and stunting prevention (Nugraheni, 2024) . Through group discussions and interactive activities, peer educators are able to change adolescents' perceptions about the importance of nutrition, iron supplement consumption, and anemia prevention (Isharyanti et al ., 2025) . A peer education approach based on Social Cognitive Theory has been shown to increase positive attitudes toward anemia prevention in adolescent girls after intervention (Ariestiningsih et al., 2025) . The role of peers as role models contributes significantly to shaping attitudes that support healthy behaviors (Mandar et al ., 2025).

Based on A1, A3, A5, and A10, health education has the potential to encourage behavioral changes in adolescents in preventing stunting. This is in line with (Nurhadi et al ., 2025) who found that nutrition education increases adherence to iron supplement consumption, which supports stunting prevention. However, (Esmayanti et al ., 2025) showed that studies that only assess knowledge cannot confirm the impact of education on stunting prevention behavior. Peer education influences changes in adolescent behavior in fulfilling nutritional needs and preventing stunting (Nurlaela & Rasmaniar, 2023) . Peer education through peer educator training improves

the practice of consuming nutritious food, compliance with iron supplement consumption, and anemia prevention behavior in adolescent girls (Rasmaniar et al., 2022). Peer education also increases adolescent participation in health activities at school and in the community as an effort to prevent stunting (Awaliah et al ., 2025) .

Based on A3, A7, and A8, adolescent compliance in taking iron tablets is influenced by health education and routine monitoring. This aligns with research (Nabila & Arnisam, 2022) , which shows that education accompanied by mentoring improves compliance with IFA tablet consumption in adolescent girls. However, (Angadi & Shubha, 2019) indicates that tablet availability alone does not guarantee compliance due to side effects, forgetting to take them, and lack of supervision. Based on A6, adolescents' acceptance of the IFA supplementation program is influenced by their understanding of its benefits and implementation. This is consistent with research (Maheswari et al ., 2024) , which reported that counseling increased adolescents' acceptance and participation in consuming iron tablets. However, (Hidayanty et al ., 2025) reported that discomfort and lack of understanding of tablet use meant that program acceptance was not always followed by compliance. Based on A6 and A8, adolescents' awareness of the risks of anemia and the benefits Fe/IFA supplementation affects Consumption compliance . (Hanas et al ., 2025) showed that good understanding encourages adolescent discipline in consuming IFA tablets. However, (Hatijah et al ., 2024) reported that compliance remains low due to a lack of supervision, even though adolescents understand the benefits of Fe tablets.

Based on A4 and A6, parental support plays a crucial role in increasing adolescent adherence to health programs, including the consumption of Fe/IFA tablets. This aligns with research (Samputri & Herdiani, 2022) , which shows that active parental support encourages adolescent discipline in consuming IFA tablets. However, (Alfiah et al ., 2020) reported that without effective supervision and communication, adolescent adherence remains low even when tablets are available.

Based on A3, A4, and A7, support from teachers and schools can encourage adolescent participation in health programs and improve compliance to IFA supplementation . This is in line with findings (Nabila & Arnisam, 2022) , which reported that teacher involvement in providing regular guidance and motivation increased adolescent compliance in consuming IFA tablets. However, this differs from studies that found that although schools provide supplementation programs , lack of Teacher involvement in monitoring results in low levels of compliance (Regmi et al ., 2024) . This emphasizes that school support must be active, not simply the provision of facilities. Based on A3, A4, and A7, teacher and school support plays a role in increasing participation and compliance. teenager to IFA supplementation . This is in line with research (Silitonga et al., 2023) which shows that active teacher involvement through routine guidance and motivation increases compliance with IFA tablet consumption. However, (Sari et al., 2024) show that without active teacher monitoring , supplementation programs in schools less effective. Based on A4, adolescents' trust in health information sources influences compliance with Education and supplementation . This is in line with research (Hidayanty et al ., 2025) , which found that trust in health workers or teachers increased adherence to IFA tablet consumption. However, (Hatijah et al ., 2024) reported that information from less credible sources decreased adolescent compliance.

Based on A2 and A8, some people still consider stunting to be a hereditary factor, resulting in a lower priority for nutritional support. This is in line with (Hermawan & Sulastri, 2023) who stated that although genetics play a role, nutritional and environmental factors are more decisive in preventing stunting. However, (Denggu et al ., 2024) reported that the view emphasizing the dominance of genetic factors often leads to the neglect of nutritional interventions. Based on A2 and A8, limited health facilities and services are obstacles to implementing nutrition programs. This finding aligns with an evaluative study (Ermeila et al ., 2024) that reported that limited access to nutrition screening and education hinders program effectiveness in rural areas. However, (Pakaya et al ., 2024) showed that cross-sector coordination can improve program implementation

despite facility base stammering . Based on A7 and A8, the implementation of the nutrition program faces distribution and coordination constraints. Inter-agency communication . This is in line with research (Vrinten et al ., 2022) , which reported that distribution delays and limited local food supplies were the main obstacles to school nutrition programs. However, (A. Pratiwi et al ., 2025) showed that good logistics planning and community participation can mitigate distribution constraints.

Based on A11, A12, and A13, MBG has a positive impact on children's nutritional status, school attendance, and learning concentration. This is in line with (Agustini & Mulyani, 2025) who stated that MBG improves Regular intake of protein, vitamins, and minerals, and encouraging local economic empowerment. However, other articles have shown that the impact of MBG is limited if the distribution and quality of the menu are not up to standard (Putra & Marsal, 2025) .

Based on A11, A12, and A13, the sustainability of MBG faces challenges such as the need for large funds, quality control, and coordination between agencies. This finding aligns with policy analysis showing that inconsistencies in nutritional standards in the field and weak coordination can impact program sustainability (Agustini & Mulyani, 2025) . However, this contrasts with studies that emphasize that sound monitoring and logistics mechanisms can improve program sustainability despite resource constraints .

IMPLICATIONS

The findings imply that adolescent-based stunting prevention programs should not rely solely on information delivery. Peer education should be formally integrated into school health programs through structured peer educator selection, standardized training modules, teacher supervision, and regular refresher sessions. In parallel, peer education should be synchronized with Fe/IFA supplementation programs so that health promotion, tablet distribution, adherence monitoring, and side-effect counseling are implemented as one coordinated package.

A practical monitoring system is also needed. Schools may document peer educator activities, attendance at education sessions, adherence to tablet consumption, and referral of adolescents with persistent barriers. Family engagement should be included through simple communication materials or periodic school-parent coordination, because support at home appears to influence whether preventive behaviors are sustained.

RESEARCH CONTRIBUTION

The main contribution of this review lies in providing a focused mapping of evidence on peer education for stunting prevention among adolescent girls. Unlike studies that discuss adolescent nutrition education in general, this review specifically synthesizes how peer-based approaches relate to knowledge, attitudes, behavior, supplementation adherence, and contextual support factors. The review therefore offers a clearer conceptual picture of where peer education is effective, under what conditions it works best, and which research gaps remain unresolved.

LIMITATIONS

This review has several limitations. First, most included studies came from Indonesia, which limits transferability to other settings. Second, the included evidence was heterogeneous in design, intervention content, and outcome measurement, making direct comparison difficult. Third, the search was limited to four sources and to full-text accessible studies, so potentially relevant evidence from other databases or inaccessible publications may not have been captured. Fourth, language restrictions may also have reduced the range of studies included. Therefore, the findings should be interpreted as a map of current evidence rather than a definitive estimate of intervention effectiveness.

SUGGESTIONS

Future research should examine peer education using stronger designs such as randomized controlled trials, longitudinal studies, and mixed-methods approaches to better assess effectiveness, process, and sustainability. Studies should also include more objective outcome indicators, such as hemoglobin level, documented Fe/IFA adherence, or repeated behavioral follow-up. In addition, future studies should explore how peer education can be integrated with school systems, family support, and nutrition program logistics in different sociocultural settings.

CONCLUSION

Peer education is a promising strategy for adolescent-based stunting prevention because it can improve knowledge, strengthen positive attitudes, and encourage preventive behaviors among adolescent girls. However, its effectiveness is not determined by peer interaction alone. Teacher support, family support, monitoring systems, and program continuity are essential to translate improved knowledge into sustained behavior. Therefore, peer education should be implemented as part of an integrated school-based strategy rather than as a stand-alone intervention.

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AUTHOR CONTRIBUTION STATEMENT

NF contributed to developing the research questions, conducting the literature search, selecting relevant articles, extracting data, analyzing the results, and drafting the manuscript. SU provided academic supervision, conducted methodological review, and offered critical feedback on the manuscript's content. DR reviewed the findings, made substantial revisions, and helped refine the manuscript before submission. All authors have reviewed and approved the final version of the manuscript.

CONFLICTS OF INTERESTS

The authors state that they have no conflicts of interest financial, institutional, or personal that could have influenced the execution of this study, the analysis of the data, the writing of the manuscript, or any part of the publication process.

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