

EATING BEHAVIORS AMONG ADOLESCENT GIRLS: A SCOPING REVIEW

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ABSTRACT

Adolescent girls in developed and developing countries currently are prone to face malnutrition, both over- and under-nutrition. One of the causes is the shift from traditional to modern diets. This study aimed to determine the factors that influence the dietary behavior of adolescent girls in developed and developing countries. Scoping review performed following the PRISMA-ScR protocol with the Population, Exposure, and Outcome (PEO) approach. Described articles were published between 2014 and 2024, including abstracts and full texts from PubMed, Scopus, and Science Direct databases. The search used the keywords “eating habits” OR “diet*” OR “dietary intake”, “adolescent girls*” OR “adolescent women*” OR “young women”. The results showed that diets of adolescent girls in both developed and developing countries correlated with malnutrition, characterized by high consumption of fast food that high in sodium and low in fiber. In developed countries, this resulted in obesity, while in developing countries it caused iron and calcium deficiencies. In developed countries, adolescent diets influenced by bullying and media pressure that idealizes thin bodies, thus triggered irregular eating patterns. Meanwhile, in developing countries, low family income, limited access to healthy food in school canteen, lack of time and cooking skills triggered low-nutrition diets. Parental support played an important role in increasing the consumption of healthy foods. Unhealthy diets increased the risk of anemia, obesity, malnutrition, and other eating disorders. Adolescent girls’ eating behavior influenced by nutritional, social, economic, lifestyle, and psychosocial factors. Therefore, educational interventions are needed through social media that are in accordance with adolescent culture, supported by family and school involvement, and increased access to nutritious food.*

Keywords: Eating behavior, eating patterns, adolescent girls, malnutrition

INTRODUCTION

Eating behavior of adolescent girls is one of the important public health issues, because during this period, adolescents experience accelerated growth and development (Norris et al. 2022). Adolescent girls experience various biological, psychological, and social changes that affect their nutritional needs and eating behavior (Neni 2024). Unmet nutritional needs during this period can cause various health problems.

In 2022, the World Health Organization (WHO) reported that nutrition in children and adolescents aged 5-19 years worldwide remains a major challenge. As many as 390 million children and adolescents are overweight, including 160 million who are obese. On the other hand, 190 million children and adolescents are recorded as being undernourished, reflecting chronic malnutrition (World Health Organization 2024a, 2024b).

Low- and middle-income countries face a serious nutrition problem, where undernutrition and overweight occur simultaneously (WHO 2019). Major changes in dietary patterns, such as increased consumption of fast and processed foods, have replaced healthier traditional foods (Khattar, 2024). As a result, unbalanced nutritional intake increases the risk of malnutrition, micronutrient deficiencies, obesity, and diet-related diseases such as diabetes, hypertension, and metabolic syndrome (Hoteit et al. 2024; Parker et al. 2010; Seligman, Laraia, and Kushel 2010).

Adolescent girls tend to have unhealthy eating pattern, with low consumption of fruits, vegetables, and whole grain products. Instead, they often choose foods that are high in fat, sugar, and salt (Nago et al. 2010). In addition, adolescent girls tend to be concerned with body image. This is influenced by family, peers, and the media (Almutairi et al. 2023). The impact of paying attention to body image among adolescent girls

tends to have irregular eating pattern and has an impact on adolescent mental health.(Almutairi et al. 2023; Choukas-Bradley et al. 2022)

Factors influencing adolescent girls' eating behavior are diverse and complex. Individual factors such as self-efficacy, nutrition knowledge, and food preferences are often became key determinants of food choices (Giguère-Johnson et al. 2021; Mama Chabi et al. 2022a). On the other hand, environmental factors such as family influence, peer pressure, availability of healthy food at home and school, and the influence of social media also play an important role (Almutairi et al. 2023; Mama Chabi et al. 2022b). In addition, economic and cultural factors also influence the eating patterns of adolescent girls, such as preferences for traditional foods or limited access to healthy foods (Daeie-Farshbaf et al. 2019; Kumar and Mishra 2019).

Although there are several studies that highlight the eating habits of adolescent girls, most of them only focus on certain aspects, thus failing to provide a comprehensive picture of their relationships. Therefore, this scoping review aims to map the factors that influence eating behavior in adolescent girls from various countries that cause various nutritional problems, namely undernutrition and overnutrition. Thus, this study can be used as a basis for designing interventions aimed at changing unhealthy eating behaviors into healthier eating patterns.

METHOD

This scoping review was conducted based on the PRISMA-ScR protocol using the Population, Exposure, and Outcome (PEO) approach (Tricco et al. 2018). The population consisted of adolescent girls. This review aimed to answer the exploratory question: *“What are the factors that influence dietary behavior in adolescent girls in developed and developing countries?”* This review included articles related to the dietary patterns of adolescent girls in various countries.

Inclusion criteria were original articles published in 2014-2024, articles related to dietary behavior in adolescent girls. The selected studies included abstracts and full texts in English. In this study, adolescent girls are defined as female

individuals aged 10 to 21 years, covering the age range of early adolescence to late adolescence. Exclusion criteria were women with adult age, elderly, studies that specifically discussed certain conditions such as anemia or obesity without linking them to general dietary behavior. The databases used were PubMed, Scopus, and Science Direct. Keywords used included such as “eating habits*” OR “dietary patterns*” OR “food intake”, “adolescent girls*” OR “female adolescents*” OR “young women”. The selected studies were reviewed by extracting data into tables (consisting of information related to objectives, methods, samples and results).

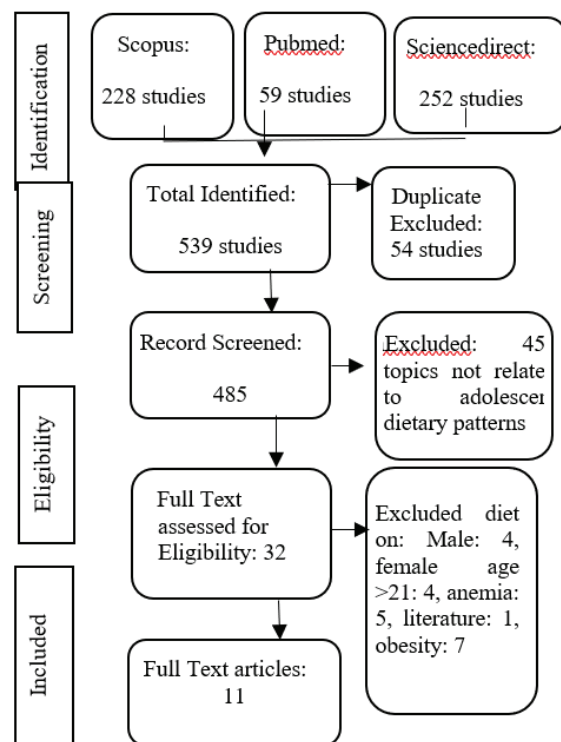


Figure 1. Prisma flow chart.

The selected articles were 11 studies from developed and developing countries. Articles from developed countries included the United States, Saudi Arabia, and Oman. Meanwhile, articles from developing countries came from the Asia and Africa regions, namely Senegal, Benin, Indonesia, Ghana, Lebanon, Iran, and India (Agra). Although this study is global, most of the articles described represent developing countries in Asia and Africa region. Two research using qualitative method and nine studies using cross-sectional method.

RESULTS AND DISCUSSION

Table 1. After the selection process carried out, researchers compiled relevant and detailed information according to the characteristics of

the research literature. The data was processed by compiling tables that reflect the characteristics of research related to literature reviews on dietary behavior in adolescent girls in various countries.

Table 1. Author/country data graph

Name	Objective	Method	Participants, sample size	Results
Madelie et al, 2021 Senegal (Giguère-Johnson et al. 2021)	To assess the energy and nutrient intake of adolescent girls, as well as to describe the types and quality of food consumed, and to evaluate the eating behavior of adolescent girls.	Cross-sectional research with purposive sampling technique, 24-hours non-consecutive recall method (two working days and one holiday) interview (30-45 minutes).	Informants: 134 adolescent girls (aged 15-19) from two colleges in Dakar, Senegal	Food intake and eating habits of Senegalese adolescent girls showed high sodium and low fiber intake. On average, 40% of energy came from fat. Zinc and calcium intakes were higher on weekends, while sodium intakes were higher on weekdays. Eighty-three percent of adolescents had inadequate iron intake, and 99% were at risk of calcium deficiency. About 60% of the foods consumed were considered healthy, but mostly whole grains.
Sherifath et al., 2022 Benin (Chabi et al. 2022b)	To investigate various factors that influence the eating habits of adolescent girls in an urban environment.	Qualitative research, random sampling, FGD method and inductive-deductive thematic method	Informants: 84 adolescent girls (aged 15-19) attending school in Cotonou, Benin	Factors influencing adolescent girls' eating habits include: personal and environmental influences, self-efficacy, the role of family and peers, the availability of unhealthy foods at school, and limited dietary knowledge.
Alfishar et al., 2017 Indonesia (Akib and Sumarmi 2017)	To analyze the relationship between nutritional intake and anemia status, and examine eating habits in adolescents who do not have anemia.	Cross-sectional research with simple random sampling method and in-depth interviews.	Informants: 60 female teenagers (aged 17-20 years) in the female dormitory of Airlangga University.	Seventy percent of respondents were anemic, with 95% having poor intake of vitamin C and iron. Anemia status was correlated with protein intake ($p=0.027$) and iron supplementation ($p=0.046$), but not with carbohydrate, vitamin C, or iron intake. Healthy eating habits include consuming animal protein, fruits rich in vitamin C, cooking your own food, and choosing healthy snacks.
Lida et al., 2015 Iran (Daeie-Farshbaf et al. 2019)	To identify the main dietary patterns of adolescent girls and evaluate their relationship with socio-economic factors.	This study is cross-sectional with random sampling from five districts through a multistage method using a structured questionnaire.	Informants: 725 female adolescents (aged 14-18 years) at Tabriz High School	The three main dietary patterns identified were western, traditional, and healthy, with a total dietary variation of 25.84%. Healthy dietary patterns were correlated with BMI <85th percentile and family income $\leq$ \$1000, while western dietary patterns were influenced by <4 family members, parental smoking, and excessive internet and mobile phone use. Behavioral and family factors are important aspects of the intervention program.

Name	Objective	Method	Participants, sample size	Results
Anwar et al., 2018 Oman (Anwar, Al-Hamed, and Al-Zubaidi 2018)	To evaluate diet and its relationship to body mass index in adolescent girls.	Cross-sectional, easy sampling technique and using structured questionnaire.	Informants: 359 female adolescents in grades 9 and 10 in 8 Omani secondary schools.	The results showed that most female adolescents did not consume enough fruits and vegetables, while consumption of sweet foods, carbonated drinks, and soda was very high. Adolescents who skipped breakfast tended to have a higher BMI, while those who consumed enough fruits and vegetables had a more ideal BMI. This emphasizes the importance of a healthy diet and good breakfast habits to prevent obesity and support adolescent health.
Julia et al, 2022 Ghana (Liguori et al. 2022)	To identify individual factors (biological, demographic, cognitive and practical) influencing dietary behaviors among adolescent girls and women at different stages of reproductive life in Ghana.	Qualitative research, purposive sampling, photovoice interviews, combining theory-based and data-based analysis.	This study involved 64 female adolescents (aged 13-15 years)	A total of 37 factors influencing eating behavior have been identified, classified into biological, demographic, cognitive, and practical domains. Income and wealth influence healthy eating patterns, while nutritional knowledge influences eating behavior choices. Cooking skills and time constraints influence eating practices, while pregnancy and breastfeeding status influence eating behavior. Food safety concerns also play a role in eating behavior decisions.
Hoseini et al., 2023 Iran (Hoseini, Djazayeri, and Movahed 2023)	This study aims to examine eating desires and body image in adolescent girls, and to identify factors that influence healthy eating behavior.	Cross-sectional research with Cochran-Morgan sampling method, and using questionnaires.	Informants: 161 adolescent girls (aged 15-18 years) in Neyshabur.	Research shows that positive body image is correlated with better nutritional quality, while desire to eat has no significant relationship with Healthy Eating Index (HEI) scores. This suggests that good body perception plays a role in supporting healthy eating patterns, while desire to eat does not directly affect diet quality.
Catherine et al, 2022 America (Dunn et al. 2022)	This study evaluated a variety of health-related behaviors, such as physical activity, food intake, and bullying experiences, to understand their association with disordered eating patterns.	Cross-sectional using large samples and standardized screening instruments to assess adolescent behavior, particularly eating behavior.	Informants: 915 female adolescents (aged 10–21 years) at the University Medical Center adolescent clinic.	The survey results showed that 6.2% of adolescent girls reported engaging in disordered eating behaviors in the past year. In addition, the study identified a relationship between disordered eating patterns and experiences of bullying, particularly among African American girls. These findings highlight the importance of more targeted health screenings and preventive actions aimed at reducing the impact of bullying on adolescent girls' well-being.
Reem et al., 2023 Arabic (Almutairi et al. 2023)	This study aimed to investigate the prevalence of eating disorders among school-going adolescent girls in Jeddah, Saudi Arabia, and to identify factors contributing to the prevalence of eating disorders in this demographic group.	Cross-sectional research with stratified cluster sampling technique, questionnaire via Google Form.	Informants: 554 adolescent girls (aged 13–18) in five public schools in Jeddah, Saudi Arabia.	The results showed a high prevalence of disordered eating behavior among female students in Jeddah, Saudi Arabia, with problems related to eating habits and body image. The prevalence of eating disorders increased from 3.5% in 2000-2006 to 7.8% in 2013-2018, indicating that this is a growing public health problem. Although there was no significant relationship between disordered eating patterns and parental education level. Instead, the influence of family, peers, and media were shown to play an important role in influencing disordered eating behavior.

Name	Objective	Method	Participants, sample size	Results
Maroon et al, 2024 Lebanon (Khattar 2024)	To assess dietary patterns, energy intake, and macro- and micronutrient consumption among a representative population of the country.	Stratified, cross-sectional cluster sampling, using questionnaires, 24-hour recall, and anthropometric measurements.	Informants: 444 adolescent girls from eight governorates in Lebanon	The study found that Lebanese adults were less likely to adhere to healthy eating patterns such as the Mediterranean, EAT-Lancet, and USDA. Their diets were high in added sugar, sodium, and saturated fat, but low in healthy fats and vitamins A, D, and E. Adult women did not meet their daily needs for calcium, vitamin D, iron, and vitamin B12, increasing their risk of anemia, osteoporosis, and other health problems. Grains and cereals were the most commonly consumed foods, and many participants were overweight or obese.
Sarvesh et al., 2019 Agra (Kumar and Mishra 2019)	To assess the nutritional and dietary patterns of adolescent girls in urban slums of Agra	Cross sectional sampling, purposive sampling, questionnaire and 24-hours recall	Informants: 240 adolescent girls (aged 10-19) in urban slums in Agra district in Uttar Pradesh	The study found that the mean age of the girls was 12 years with a diet low in dairy, fruits and leafy vegetables. The majority of them were vegetarians, while the rest were non-vegetarians. There were significant differences in macronutrient and micronutrient intakes between different age groups.

Data analysis was conducted thematically by adopting the approach (Braun and Clarke 2006). This process involved six stages, namely: (1) familiarization with the data through repeated reading of articles, (2) manual coding of relevant information related to adolescent eating behavior, (3) grouping codes into subthemes and themes, (4) reviewing themes to ensure consistency of meaning, (5) defining and naming themes clearly, and (6) compiling thematic tables. All processes were carried out manually without the help of qualitative software, but were carried out systematically to ensure the reliability of the results. Table 2. Presents the main themes of adolescent eating behavior. The reviewed articles cover topics including factors contributing to the problem.

The adolescent girls diet showed different nutritional challenges between developed and developing countries, where developed countries tend to experience overnutrition, while developing countries face the problem of undernutrition, but both are characterized by low fiber intake and high sodium consumption. In developed countries such as Oman, adolescents tend to face overnutrition, characterized by low consumption of fruits and vegetables and high intake of foods high in sugar and calories resulting in adolescent girls' obesity (Anwar et al. 2018). Meanwhile, in developing countries such as Senegal, high consumption of

Table 2. Subtheme Mapping

Theme	Sub Themes	Article
Nutritional Factors	a. Consumption pattern of food high in sodium, fat, and low in fiber	(Anwar et al. 2018; Giguère-Johnson et al. 2021)
	b. Micronutrient deficiencies	(Akib and Sumarmi 2017; Khattar 2024)
Social and Economic Factors	a. Social pressure	(Chabi et al. 2022b)
	b. Low family income	(Daeie-Farshbaf et al. 2019; Kumar and Mishra 2019; Liguori et al. 2022)
Lifestyle and Psychosocial	a. Cooking knowledge and skills	(Liguori and friends, 2022)
	b. Social media pressure on body shape/body image	(Almutairi et al. 2023; Hoseini et al. 2023)

fat and sodium, accompanied by low fiber intake, causes iron and calcium deficiencies. This is largely due to eating habits that rely on fast food (Giguère-Johnson et al. 2021). Consuming foods and dishes that contain high levels of sodium excessively and over a long period of time is a serious problem because it can increase the risk of hypertension later in life (Ha 2014).

In developing countries such as Lebanon and Indonesia, low iron and vitamin D intakes lead to

high prevalence of anemia, which is exacerbated by not eating and low consumption of iron-rich foods (Akib and Sumarmi 2017; Khattar 2024). Low vitamin D levels can increase the risk of anemia through its effects on erythropoietin production, immune cell regulation, and hepcidin levels. Vitamin D deficiency inhibits red blood cell formation, triggers inflammation, and interferes with iron absorption, thereby reducing hemoglobin levels in the body (Putri et al. 2019).

Food sources rich in iron such as liver, red meat, white meat, nuts, and green vegetables are very important to consume. Adolescent girls are advised to consume 26 mg of iron per day to meet their iron needs. High intake of protein, vitamin C, and iron can increase hemoglobin levels in the body (Thamrin and Masnilawati 2021). Unhealthy eating behavior is influenced by the low knowledge of adolescent girls so that interventions are needed to increase knowledge about anemia and healthy eating patterns (Hulaila, Shaluhiah, and Winarni 2024; Winarni et al. 2024). This can form healthy eating behavior and reduce the risk of serious health problems later in life.

In developing countries, adolescents' eating patterns are influenced by a variety of social and economic factors. In Benin, a study showed that family support plays an important role in developing healthy eating habits. Adolescents who receive parental supervision tend to choose more nutritious foods. Parents show displeasure when their children consume excessive amounts of sugary drinks, sweet snacks, or high-fat foods, especially during lunch or dinner at home. In response to parental attitudes, adolescents are encouraged to choose healthier snacks and desserts. In contrast, peer pressure and a less supportive school environment contribute to the development of poor eating habits. (Chabi et al. 2022b).

This is also seen in countries such as Morocco and Botswana, where parents want their children to eat healthy foods. However, they often provide unhealthy foods. This is due to several factors, including children's tastes and social influences that encourage parents to show their economic ability through purchasing foods that are considered "luxurious" or "modern". On the other hand, peers put quite strong social

pressure on adolescents, especially in choosing non-traditional foods as a symbol of social status. As a result, traditional foods are often considered old-fashioned or uncool, so that adolescents feel ashamed or afraid of being ostracized if they consume them (Brown et al. 2015; El-Ammari et al. 2020). The role of parents is very important in forming healthy eating patterns in adolescent girls. However, this role needs to be supported by the social environment that also encourages healthy food choices. Thus, parental involvement in program interventions is very necessary to improve adolescent eating patterns optimally.

In Benin, one of the factors influencing adolescent girls' eating habits was the lack of access to healthy foods in school canteens (Chabi et al. 2022b). These findings are consistent with other studies showing that easy access to unhealthy foods drives the consumption of these foods among adolescents (El-Ammari et al. 2020). Access to healthy foods is an important aspect in shaping adolescent girls' eating habits. When healthy foods are less accessible, adolescents tend to choose more convenient and less nutritious options. Therefore, providing healthy foods in the school environment is a strategic step that can help improve eating patterns and support the long-term health of adolescents.

In addition, family income is a major determinant of access to healthy food, as seen in Iran, Ghana, and the Agra slums, where extreme poverty hinders the consumption of nutritious foods (Daeie-Farshbaf et al. 2019; Kumar and Mishra 2019; Liguori et al. 2022). However, on the other hand, individuals with high incomes are more likely to follow healthy eating patterns (Mohammadifard et al. 2012). Conversely, other studies have found that individuals with low socioeconomic status are more likely to consume unhealthy foods (Araújo et al. 2015). In this case, family income plays a role in determining adolescent girls' eating patterns.

In developing countries, such as Ghana, the challenge is more related to lifestyle, lack of cooking skills plays a role in unhealthy eating patterns (Liguori et al. 2022). Busy lifestyles often leave little time for cooking, leading to increased consumption of fast food and snacks. This can potentially increase the intake of low-nutrient

foods that do not provide satiety (Bhatoolaul, Alrefaei, and Jeewon 2024).

Meanwhile, in developed countries, psychosocial factors are more related to social media pressure on body image. In Arab and American countries, bullying and social media influence affect adolescents' body image, which can lead to eating disorders or unhealthy eating habits. (Almutairi et al. 2023; Dunn et al. 2022). A Swedish study found that frequent bullying in childhood was positively associated with eating disorders in adulthood. These findings suggest that being a victim of bullying is not only associated with eating disorders, but may also act as a risk factor for these disorders (Gattario, Lindwall, and Frisen 2020). These findings underscore the importance of understanding how bullying affects eating disorders, taking into account social and racial differences. Furthermore, community intervention efforts are needed to raise awareness of the impact of bullying on adolescent eating.

Disordered eating among adolescent girls in Jeddah, Saudi Arabia, is a concerning phenomenon, with a high prevalence due to various social factors, such as family influence, peer pressure, and media exposure. Dissatisfaction with body shape is a major trigger, leading to unhealthy weight loss behaviors. This highlights the important role of the social environment in shaping adolescent eating habits (Almutairi et al. 2023). Parental comments and criticism about body shape and weight are often associated with body image issues and may increase the risk of eating disorders in adolescent girls (Abraczinskas, Fisak Jr, and Barnes 2012; Michael et al. 2020). In addition, exposure to mass media, such as images of celebrities and thin models on social media, has exacerbated body image issues and dissatisfaction among adolescent girls. This, in turn, increases the risk of adolescent girls developing eating disorders (Dahlgren et al. 2024).

In contrast, a study in Iran showed that positive body image contributes to healthier eating patterns. Adolescents who are satisfied with their bodies are more likely to choose nutritious foods and have good eating habits, as measured by the Healthy Eating Index (HEI) (Hoseini et al. 2023). Adolescent girls tend to be more self-conscious about their body shape, especially when influenced

by peer comments about appearance and weight, compared to adolescents living in different cultural environments (Garrusi and Baneshi 2012). Thus, psychosocial factors such as negative body image and social environmental influences may promote unhealthy eating habits in adolescent girls.

This scoping review has several limitations, such as limited geographic coverage, methodological variation between studies, and the use of secondary data. of published studies due to variations in design, population, and reporting quality, affecting the consistency and generalizability of findings. Nevertheless, this review can still provide a useful picture of the dietary behavior of adolescent girls across countries, as well as the factors associated with it. These findings can provide an important basis for further intervention and research.

CONCLUSION

The diet of adolescent girls in developed and developing countries faces nutritional problems in the form of excess and malnutrition. Developed and developing countries show a high sodium and low fiber consumption pattern. However, in developed countries it results in obesity in adolescent girls, while in developing countries it results in iron and calcium deficiencies.

The eating patterns of adolescent girls in developing countries are influenced by various social and economic factors. Adolescents who receive supervision and guidance from parents tend to have healthier eating habits. However, the lack of nutritious food in school canteens encourages the formation of poor eating patterns. In addition, low family economic conditions are an obstacle to accessing nutritious food consistently.

In developing countries, lifestyles such as lack of cooking skills encourage teenage girls to consume fast food. While in developed countries, psychosocial pressure from social media triggers the desire to have an ideal body, resulting in irregular eating patterns.

The diets of adolescent girls in developed and developing countries face different nutritional challenges. Developed countries tend to experience overnutrition leading to obesity, while developing countries face deficiencies in nutrients such as iron

and calcium. Although different, both show a high sodium and low fiber consumption pattern.

In developing countries, adolescent girls' eating patterns are influenced by social and economic factors. Adolescents who receive parental guidance tend to choose healthy foods. However, limited access to nutritious food at school and low family economic conditions are major obstacles in forming healthy eating habits.

In addition, lifestyle also plays a role. Lack of cooking skills encourages fast food consumption among teenagers. Meanwhile, in developed countries, psychosocial pressure from social media affects the body image of teenage girls and encourages irregular eating patterns in order to achieve an ideal body shape.

This review shows that there is a lack of interventions that consider culture and collaboration between families, schools, and media. The use of digital media such as social media has not been widely evaluated for its impact on adolescent girls' eating patterns. Therefore, recommended interventions include nutrition education through social media that is culturally appropriate for adolescents, active participation of families and schools, and increased access to nutritious foods. This approach can also form the basis for further research that combines technology and community support to prevent nutritional problems in a sustainable manner.

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