The effectiveness of peer group on adolescent anemia prevention behavior: a systematic review

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Abstract

Anemia is one of the major nutritional problems in the world, especially among adolescents. The aim of this systematic research is to review the effectiveness of peer groups in preventing anemia in adolescents. Articles were searched from four electronic databases such as Science-direct, PubMed, Sage, and Springer. An online search for articles was carried out in August 2022 and provided that articles were published from 2018 to 2022. Several keywords were used for literature searching, including "peer group to prevent anemia" and "anemia prevention in adolescent". Data selection using PICOS and PRISMA flowchart get 9 articles. Data were narratively described. The result of this review showed that peer group intervention changed the behavior to prevent anemia in adolescents. Peer group intervention proved knowledge, attitude, skill, intention, and behavior to prevent anemia in adolescents. The conclusion of this literature review is that peer group was an effective strategy for preventing anemia in adolescents.

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Introduction

Health and nutrition problems in Indonesia in the first 1000 days of life are the focus of attention because they not only have an impact on maternal and child mortality and morbidity but also on permanent quality of life. The emergence of nutritional problems in children under 2 years of age is closely related to the preparation of woman's nutritional health to become mothers, including adolescents. Nutritional problems that often occur in adolescents include obesity, anemia, and chronic energy deficiency. Adolescents at puberty are very at risk of iron deficiency due to a large amount of iron lost during menstruation. In addition, it is exacerbated by a lack of iron intake and mistakes in the dieting program.[1]

Anemia is an insufficient mass of red blood cells to meet the physiological needs of the body.[2] More than 50% of anemia occurs in children and adolescents.[3] This problem had consequences for physical, social, and economic development.[4,5] Anemia often occurs, especially in developing countries such as Indonesia.[6] The prevalence of anemia remained relatively high for girls, especially at 15-17 years old.[7,8] Iron deficiency is common in adolescents which is 14% in 11-14 years of girls and 27% in 15-18 years old.[9] Based on RISKESDAS in 2018, it was shown that 32% of teenagers had anemia, which means that 3 up to 4 teenagers from 10 had anemia.[10] This figure is higher than the incidence of anemia in the world, which is 27%.[11]

Several factors that cause anemia in adolescents are low knowledge about anemia, a large number of family members, and malnutrition.[5,12,13] Anemia can also cause by nutritional deficiencies, bleeding and hemolysis.[1,14] Some of the impacts that will occur due to anemia include upper respiratory tract disorders such as asthma, pneumonia and the common cold.[15] If this anemia is not treated, it will cause stunting in the future. Providing prevention through iron supplementation in adolescents and then continuing during pregnancy can prevent anemia which causes stunting and other complication.[16,17]

There are many programs that the government holds to reduce anemia in adolescents, such as developing health education, screening for anemia in every high school, giving iron tablets, and raising the role of UKS in school.[1,18] Reducing the incidence of anemia starting from adolescence was better than during pregnancy.[19] Anemia prevention behavior is influenced by knowledge and attitudes about anemia prevention, starting in teenagers.[20] Adolescents who do not have anemia, 45% have positive knowledge and attitudes toward anemia prevention.[21]

Anemia prevention programs in schools involve many elements, including teachers, parents, peers and students.[1,22] Peer group is one of the social supports that affect perceived self-efficacy as a social reinforcement that affects anemia prevention behavior in adolescents.[23] It can be concluded that the aim of this research is to review the effectiveness of peer groups in preventing anemia in adolescents.

Materials and Methods

Articles were searched from four electronic databases such as Science-direct, PubMed, Sage and Springer. An online search for articles was carried out in August 2022, provided that articles were published from 2018 to 2022. Keywords that used for literature searching are "peer group to prevent anemia" and "anemia prevention in adolescents".

Inclusion and exclusion criteria

The aim of the literature review is to answer the research question "how is the effectiveness of peer groups in preventing anemia in adolescents?". The PICOS approach used to Studies to be included in this review had to match predetermined criteria according to PICOS approach shown in Table 1.

Data extraction and data synthesis

Four electronic databases were searched up until August 2022. Keywords identified to improve peer group-related outcomes for anemia prevention in adolescents.

Results

Study selection

The articles screened amount 7.601 from Science-direct (1.9740, PubMed (26), Sage (2.546), and Springer (3.055), which is related to the keyword. After duplicate removed from journal articles, it is found 2.327 articles. After that, we find the articles published in 5 years (2018-2022). The study published before 2018 assumed that it might be not suitable for the condition this year. Then, full text and open-access articles of 263 were followed to the next review. Based on inclusion and exclusion criteria, we assessed 13 articles. The selection step uses PRISMA flowchart that is shown in Figure 1.

Study characteristics

Nine studies containing eight articles were experimental design, in which two of the studies used randomized control trials and one study used mix method. All of the intervention studies were able to prove the positive outcome of peer groups in prevention behavior. The minimum duration of intervention was 4 weeks or 1 month and the largest duration was 12 months or a year. This reviewed article includes some different countries such as Indonesia, Jordan, China, England, America and Spain. The most prevalent measurable outcomes were knowledge, attitude, intention, skill and behavior. Table 2 shows the detail of each study.

Discussion

The result of this review showed that peer group intervention changed the behavior to prevent anemia in adolescents. Some of the articles showed that peer group intervention proved knowledge, attitude, skill, intention and behavior to prevent anemia in adolescents. This means that peer group was an effective strategy for reducing anemia in adolescents. One article showed that peer group intervention also improves nutrition intake like calories, protein, iron, vegetables and fruit intake.[24] If the intake of nutrition can fulfill the body's needs, it can be concluded that there is no lack of nutrition and reduced anemia, especially in adolescents.

These results are in line with the strategy developed to reduce the incidence of anemia through improving nutrition and health education, improving nutrition monitoring and interventions.[25,26] Women as one of the main target population groups for nutrition improvement. Counseling on nutrition can be carried out on an ongoing basis in all regions, especially with low education. In contrast with women who are already working, there are several ideas for controlling anemia in the work area, including establishing a

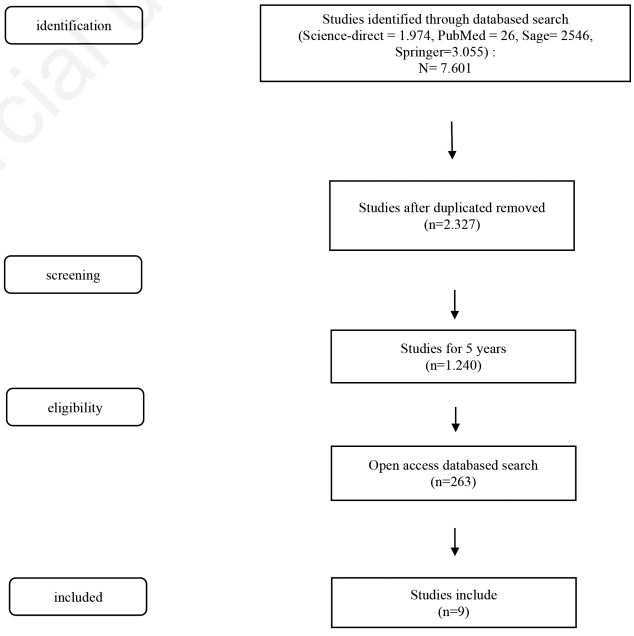

Figure 1. PRISMA flowchart of studies.

Table 1. Population, intervention, comparison, outcomes and study (PICOS) criteria for inclusion and exclusion of studies.

Parameter	Inclusion criteria	Exclusion criteria
Population	Adolescent	
Intervention	Intervention by peer group	Without peer group
Comparison	How effective are the different methods	
Outcomes	Behavior to prevent anemia	
Study	Experimental, cross sectional	Literature review, meta-analysis, comments, short communication, editorial letters, non-English articles

Table 2. Summary of the influence of peer group on anemia prevention.

Reference	Study design	Respondent	Intervention group	Control group	Intervention duration	Outcome
Zuraida, et al[24]	Quasi experimental design	102 senior high school students	55 participants for with nutrition education based on anemia free club for 12 weeks	No intervention	12 weeks	Anemia free club intervention increasing calories, iron, protein, fat, animal protein, vegetable protein, vegetables and fruit intake (p<0,05)
Abu-Baker, et al[21]	Quasi experimental design (pretest-posttest control group)	363 public secondary school	194 participants	169 participants	1 month	(p<0,05) Structure educational intervention effectively improves knowledge, attitude and practice regarding iron deficiency anemia
Madestria, et al[25]	Quasi experimental design	124 junior high school students	62 participants using video and packaging modification iron tablet	62 participants using video	3 months	The development of educational media for iron tablet intake through the video along packaging modification of iron tablet contributed a significant effect on the knowledge, attitudes and intentions the iron supplementation intake (p=0,001)
Sutanto, et al[26]	Quasi experimental design	192 adolescents	96 participant each group divided into 8 group.	-	8 weeks	CFHC program increase ARH attitudes (p=0,045), skill (p=0,009) of adolescent in rural area. Improved the ARH knowledge in both rural and urban area. (p< 0,001)
Misch, Dunham[27]	Quasi experimental	296	Experiment 2: 164 children observe with peer model	Experiment 1: 132 children observe	1 month	Children in younger age significantly influenced by peer model.in moral behavior.
Gillard, et al[28]	RCT	590	294 with peer support	296 without peer support	12 months	One to one peer support did not change impatient psychiatric care after admission.
D'Arqom, Indiastuti[29]	Mixed method	83 students	83 students, 20 students observe and interviewed	-	4 weeks	Peer group have a big impact in behavior and knowledge
Muller, et al [30]	experimental design	1125 students	1125 student	-	3 months	Classroom peer context effect for conceptual skill, controlling for student earlier skill, age and gender.
Alvira, et al[31]	RCT	543 adults aged 25 to 50 years	321 adults reassess	222 adults	12 months	One year peer- group based intervention showed favorable results at immediate post intervention

healthy canteen, improving services at company clinics and controlling the risk of anemia due to work.[27]

There is no research that mentions the effect of the consumption of iron tablets on the amount of blood released during menstruation. This is important to know because one of the causes of anemia is the large amount of blood that comes out during menstruation, genetic abnormalities in hemoglobin and the presence of other infectious diseases.[28,29] Heavy and light menstruation can be discussed with peers, especially in sharing experiences and how to overcome them.

Based on the guidelines for preventing anemia in Indonesia, adolescents receive iron tablets as an effort to reduce the number of anemia and also the incidence of stunting. One article states that peer group intervention can increase knowledge, attitudes and intention to iron tablet.[1,30] Peer groups can influence self-efficacy to gain the intention of adolescents to get iron supplementation.[31,32] Health information can be spread easily with the peer group because it can eliminate the language barrier for information.[33] Peer groups that had the same communication with adolescents more easily discussed and tried to consume the iron tablet, although its tablet had some problems for adolescents such as smelling bad. Modifying the packaging of the iron tablet gives a new look to the tablets and attracts adolescents to consume. The experience and theory gained can be used as information that is passed on to peers to be used as an alternative choice in overcoming the problem of anemia in adolescents.[34,35]

Besides peers, parents and schools also play an important role in efforts to reduce the incidence of anemia, especially in adolescents.[36] Parents as a family can be a supporting system in preventing and overcoming anemia through managing nutrition in the family and controlling behavior that can cause anemia in adolescents.[37] Schools have a role in preventing anemia in adolescents. School practitioners can continue the counseling and sharing peer group to students to maintain a healthy food consumption pattern with a sustainable way to avoid anemia.[38,39]

In addition to iron supplementation, it is also important to consume vitamin C because it can increase the absorption of iron consumed. Consumption of iron tablets accompanied by vitamin C can be started during adolescence.[40]

Three articles of 9 studies showed that the intervention must be held at least 4 weeks or a month. More interaction is needed to gain the trust of peer to change the behavior. The longer the time of intervention, the longer the interaction time between peer groups and adolescents will be able to change understanding, attitudes and behavior.[41] Some research showed that adolescents who have a community could promote some information via informal social networks with peers approach to change behavior that can reduce anemia in adolescents.[42]

The limitation of this literature study is the articles that found a lack of discussion about the behavior changes through anemia prevention. Most of the research on anemia only revolves around preventive efforts through intake nutrition and iron supplementation than behavior changes.

Conclusions

The conclusion of this systematic literature review showed that peer groups increase knowledge, attitude, skill, practice and behavior regarding iron supplementation and preventing anemia in adolescents. More studies are needed to search the different types like a combination of peer group support and family support to change the anemia prevention behavior.

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