

ACT (Aware, Check, Treat): A Community-Based Program to Enhance Adolescents' Awareness and Early Detection of Anemia

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ABSTRACT

Adolescent anemia remains a major public health concern in many low- and middle-income countries, including Indonesia and the Philippines. Limited awareness, inadequate nutrition knowledge, and poor preventive practices contribute to the high prevalence of anemia among adolescents, particularly girls. Community-based health education is a promising strategy to improve anemia awareness and encourage early prevention. This community service program aimed to improve adolescents' knowledge and awareness of anemia prevention through the ACT (Aware, Check, Treat) – Teen Anemia Can't Wait educational intervention. The program was implemented in the International Collaboration Trip (ICT) 2025. It was conducted at Manila Central University High School, Philippines, involving 38 students. Most participants were 18 years old (44.4%), enrolled in Grade 12 (66.0%), and female (61.1%). Participants actively engaged in all educational activities and demonstrated a good understanding of the topics discussed. During the evaluation, most students answered questions on the causes, symptoms, prevention, and early detection of anemia correctly and confidently, indicating improved knowledge and awareness following the intervention. The ACT (Aware, Check, Treat) program effectively enhanced adolescents' knowledge and awareness of anemia prevention through interactive and skills-based health education. Similar community-based interventions should be expanded through sustained collaboration among schools, healthcare providers, and families to strengthen adolescent anemia prevention.

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INTRODUCTION

Anemia remains one of the most prevalent nutritional disorders among adolescents worldwide and continues to be recognized as a major public health challenge. Anemia as a condition in which the hemoglobin concentration is lower than the normal threshold for age and sex, resulting in reduced oxygen-carrying capacity of the blood. Adolescence is a period of rapid physical growth and increased nutritional requirements, making adolescents, particularly girls, more susceptible to iron deficiency because of menstruation, accelerated growth, inadequate dietary iron intake, and

unhealthy dietary behaviors. Therefore, WHO identifies adolescent girls as a priority population for anemia prevention because improving their nutritional status contributes substantially to healthier pregnancies and better maternal and child health outcomes in adulthood (1).

Indonesia continues to experience a considerable burden of adolescent anemia despite ongoing national prevention efforts. Riset Kesehatan Dasar (Riskesdas) Tahun 2028 reported that approximately 32% of adolescents aged 15–24 years were affected by anemia, with adolescent girls experiencing a substantially higher prevalence than boys (2). In response, the Indonesian government has implemented several strategies, including the Aksi Bergizi program, weekly iron-folic acid supplementation (WIFS), nutrition education, and healthy lifestyle promotion in schools. However, recent studies indicate that the effectiveness of these programs remains limited because of poor compliance with iron tablet consumption, inadequate awareness of anemia, misconceptions regarding iron supplementation, and insufficient community participation (3). These findings suggest that biomedical interventions should be complemented by comprehensive educational and community-based approaches.

The Philippines faces similar challenges regarding adolescent anemia. National nutrition reports indicate that anemia remains one of the leading micronutrient deficiencies among Filipino adolescents, particularly girls, owing to increased physiological iron requirements during puberty and menstrual blood loss (4). In addition, dietary inadequacy, socioeconomic disparities, limited access to preventive health services, and low nutrition literacy continue to contribute to the persistence of anemia (5). As neighboring Southeast Asian countries undergoing similar demographic and nutritional transitions, Indonesia and the Philippines share common public health challenges that warrant collaborative and community-oriented approaches for anemia prevention.

The impact of anemia during adolescence extends beyond reduced hemoglobin concentration. Numerous studies have demonstrated that anemia negatively affects cognitive function, concentration, learning achievement, physical performance, immune response, and psychosocial well-being (1,6). Furthermore, adolescent girls with untreated anemia are more likely to enter pregnancy with depleted iron stores, thereby increasing the risk of maternal anemia, preterm birth, low birth weight, and intergenerational malnutrition (WHO, 2024). Recent systematic reviews have consistently shown that interventions integrating iron supplementation with nutrition education and behavior change communication are significantly more effective in improving hemoglobin levels and preventing anemia than supplementation alone (7,8).

Community-based interventions have increasingly been recognized as sustainable strategies for preventing adolescent anemia because they actively involve schools, families, peer groups, and community health workers. Previous studies have shown that integrating health education, peer support, hemoglobin screening, nutrition counseling, and referral services significantly improves adolescents' knowledge, preventive behaviors, treatment adherence, and participation in nutrition programs (5,9). Nevertheless, most community interventions focus on a single strategy, such as education or supplementation, with limited integration of awareness building, early screening, and immediate follow-up. Therefore, this community service program implemented the ACT (Aware, Check, Treat) model, which combines anemia education, self screening, counseling, and referral into a comprehensive community-based intervention. This integrated approach is expected to improve adolescents' awareness, facilitate early identification of anemia, and promote timely treatment while providing a practical model for anemia prevention that can be replicated in Indonesia, the Philippines, and other Southeast Asian settings.

METHOD

This community service program employed a community-based health education approach to improve adolescents' awareness of anemia prevention. The program was implemented through several stages, including planning, preparation, implementation, and evaluation. The planning phase commenced in early April 2025 and involved proposal development, coordination with partners, scheduling, preparation of educational materials, and logistical arrangements. The activity was conducted as part of the International Collaboration Trip organized in collaboration with Universitas Persada Indonesia YAI (UPI YAI).

The community service activity was carried out on 11 June 2025 and involved 50 adolescent students aged 15–18 years. The intervention adopted the ACT (Aware, Check, Treat) framework, which integrates health education, early anemia awareness, and encouragement to seek appropriate health services. The educational materials covered the definition of anemia, risk factors among adolescents, health consequences of anemia, preventive strategies, and the importance of early detection and timely treatment. Interactive learning methods, including lectures, discussions, games, and question-and-answer sessions, were employed to encourage active participation and improve knowledge retention.

The implementation consisted of three sequential sessions. The first session was the opening activity, which included participant registration, welcoming remarks, an ice-breaking activity, and administration of a pre-test to assess baseline knowledge regarding anemia. Interactive games were incorporated to create an engaging learning environment and increase participants' motivation. The second session, focused on the delivery of the ACT educational materials. Participants received information on the definition of anemia, risk factors, prevention strategies, and the potential health consequences of untreated anemia. A discussion and question-and-answer session followed the presentation, allowing participants to clarify misconceptions and actively engage with the educational content. The final session consisted of program evaluation and closing activities. Participants completed a post-test using the same questionnaire administered before the intervention to evaluate changes in knowledge following the educational session. The effectiveness of the program was evaluated by comparing pre-test and post-test scores to determine changes in participants' knowledge regarding adolescent anemia prevention.

RESULTS AND DISCUSSION

This community service program was conducted in collaboration with Universitas Persada Indonesia YAI (UPI YAI) as part of the International Collaboration Trip (ICT) 2025. The ICT program involved academic visits to several higher education institutions in Manila, Philippines, some of which are affiliated with senior high schools that served as venues for the participating institutions' community service activities.

The activity was conducted on 10 June 2025 in Manila Central University High School, Manila, Philippines at 11:00 AM (Philippine Standard Time) and was attended by 38 high school students. Participants actively engaged in the educational sessions, discussions, and evaluation activities designed to improve their knowledge and awareness of adolescent anemia prevention through the ACT (Aware, Check, Treat) program.

Participants in the ACT (Aware, Check, Treat) – Teen Anemia Can't Wait community service program were adolescents aged 15–19 years, representing the middle and late stages of adolescence. The largest age group was 18-year-old students (44.4%), while the majority of participants were enrolled in Grade 12 (66%). This age group represents a critical developmental period characterized by rapid biological, cognitive, and psychosocial changes. During adolescence, nutritional requirements, particularly iron requirements, increase substantially because of accelerated physical growth and the maturation of the reproductive system, especially among females (10) (Patton et al., 2016). Consequently, adolescents are considered one of the priority populations for anemia prevention through health promotion and nutrition interventions, as improving iron status during this stage contributes to better health outcomes throughout adulthood.

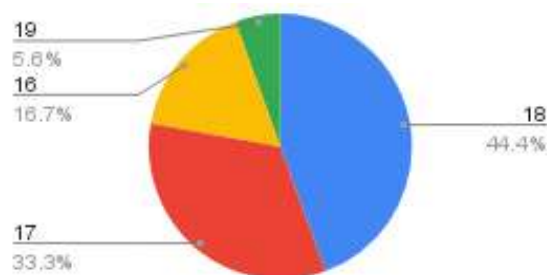


Figure 1. Participant Characteristics by Age

Female participants accounted for more than half of the total participants (61.1%) in this community service program. Female adolescents are particularly vulnerable to iron deficiency anemia because of regular menstrual blood loss, increased physiological iron requirements during puberty, and dietary patterns that are often inadequate to meet their nutritional needs (3). Evidence consistently indicates that the prevalence of anemia is substantially higher among adolescent girls than boys, particularly in low- and middle-income countries. This vulnerability is further exacerbated by insufficient consumption of iron-rich foods, poor dietary diversity, and limited exposure to nutrition education in both school and family settings (11). These factors highlight the importance of implementing comprehensive health education and community-based interventions that promote healthy dietary behaviors, increase awareness of anemia prevention, and encourage adherence to iron supplementation programs among adolescents.

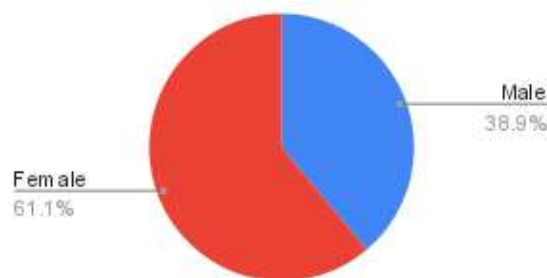


Figure 2. Participant Characteristics by Sex

The implementation of the ACT (Aware, Check, Treat) – Teen Anemia Can't Wait educational program was carried out smoothly and according to the planned schedule. Each stage of the program, including the opening session, educational presentation, discussion, and anemia screening, was conducted on time without any significant obstacles. Adherence to the scheduled timeline is essential in educational interventions such as this, as it helps maintain participants' attention and engagement while ensuring that all planned learning activities are delivered effectively.

The program began with an ice-breaking activity in which participants performed the Agadoo Dance. The students enthusiastically followed the movements, creating a relaxed and enjoyable learning atmosphere. Ice-breaking activities play an important role in health education by reducing tension, fostering rapport between facilitators and participants, and enhancing participants' psychological readiness to engage in the learning process. Among adolescents, such activities are particularly effective in reducing feelings of awkwardness, increasing self-confidence, and encouraging active participation throughout the session. Previous studies have shown that creating a positive and interactive learning environment at the beginning of an educational activity can improve participants' attention, motivation, and knowledge retention.



Figure 3 and 4. Opening session

The educational session was subsequently delivered using an interactive approach that encouraged two-way communication between the facilitators and participants. The session began with a brainstorming activity to assess participants' baseline knowledge and to stimulate discussion regarding anemia. This approach enabled the facilitators to identify common misconceptions and tailor the educational content to the participants' needs. The educational materials covered the definition and epidemiology of adolescent anemia, methods for early detection, health consequences, preventive strategies, and appropriate management of anemia. The combination of interactive discussion and participant-centered learning created opportunities for adolescents to actively ask questions, share experiences, and reinforce their understanding of anemia prevention and healthy lifestyle practices.

During this session, participants were guided to perform a simple anemia self-screening activity by measuring their pulse rate and examining the conjunctival color of their peers. This practical exercise was incorporated as part of a skills-based health education approach designed to enhance body awareness and improve adolescents' ability to recognize the early signs and symptoms of anemia. By actively engaging in the screening process, participants gained hands-on experience in identifying simple clinical indicators that may suggest anemia. An elevated pulse rate and pale conjunctiva are recognized as common clinical signs that may indicate mild to moderate anemia, although a definitive diagnosis requires hemoglobin testing (12). Therefore, the self-screening activity was intended to increase participants' awareness of these early warning signs rather than to establish a clinical diagnosis. This approach encourages adolescents to seek appropriate medical assessment when they identify potential symptoms of anemia. In addition to improving knowledge, direct participation in the self-screening exercise enhanced participants' confidence in recognizing potential health problems and promoted greater responsibility for their own health and well-being. Practical, participatory learning experiences have been shown to be more effective than lecture-based education alone in improving health literacy, strengthening self-efficacy, and encouraging early health-seeking behaviors among adolescents (13,14).



Figure 5 and 6. Photo session

The evaluation was conducted as planned through an interactive question-and-answer session covering the causes, signs and symptoms, and prevention of adolescent anemia. Most participants answered the questions accurately and confidently, indicating that the educational intervention

successfully improved their understanding of the topic. In addition to assessing learning outcomes, the evaluation reinforced key health messages and clarified participants' understanding. Participatory evaluation methods have been shown to enhance learner engagement, strengthen health literacy, and promote sustainable behavior change in health education programs.

CONCLUSION

The ACT (Aware, Check, Treat) – Teen Anemia Can't Wait community service program successfully improved adolescents' knowledge and awareness of anemia prevention through interactive health education and practical self-screening activities. The high level of participant engagement and their ability to correctly answer evaluation questions suggest that the program effectively enhanced their understanding of anemia and its prevention. Future community-based programs should expand this intervention by incorporating routine hemoglobin screening, regular nutrition education, and stronger collaboration among schools, healthcare providers, and families to promote sustainable anemia prevention and healthy behaviors among adolescents.

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