



Complementary Nutrition, Anemia, and Menstrual Health Education for Adolescent Girls

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History Artikel Received : 15-9-2026 Accepted: 26-9-2026 Published: 1-12-2026 Kata kunci Edukasi kesehatan; Pengabdian masyarakat; Remaja putri.	ABSTRAK Remaja putri di SMA Negeri 5 Padang menghadapi risiko kesehatan reproduksi yang saling berkaitan akibat gizi tidak adekuat, anemia defisiensi besi, dan higiene menstruasi yang belum optimal. Kegiatan pengabdian kepada masyarakat ini bertujuan meningkatkan pengetahuan kesehatan reproduksi siswi melalui program edukasi komplementer gizi seimbang, pencegahan anemia, dan kesehatan menstruasi. Metode pelaksanaan berupa 8 sesi edukasi terstruktur selama empat minggu menggunakan ceramah interaktif, diskusi kelompok, dan demonstrasi praktis, didukung leaflet tematik, dengan evaluasi pre-test dan post-test terhadap 30 peserta. Hasil kegiatan menunjukkan rata-rata skor pengetahuan meningkat signifikan dari 47,11 menjadi 75,78 (peningkatan 28,67 poin; $p < 0,001$), dengan proporsi kategori pengetahuan baik meningkat dari 0% menjadi 50,0%. Simpulannya, program edukasi komplementer ini efektif meningkatkan pengetahuan kesehatan reproduksi siswi dan direkomendasikan untuk direplikasi serta diintegrasikan ke kurikulum kesehatan sekolah.
Keywords: Adolescent girls; Community service; Health education.	ABSTRACT <i>Female students at SMA Negeri 5 Padang face compounding reproductive health risks from inadequate nutrition, iron-deficiency anemia, and suboptimal menstrual hygiene. This community service activity aimed to improve students' reproductive health knowledge through a complementary education program covering balanced nutrition, anemia prevention, and menstrual health. The implementation method consisted of eight structured education sessions over four weeks using interactive lectures, group discussion, and practical demonstration, supported by topic-specific leaflets, with pre-test and post-test evaluation of 30 participants, analyzed using paired t-test and normalized gain (N-Gain). Results showed the mean knowledge score increased significantly from 47.11 to 75.78 (an increase of 28.67 points; $p < 0.001$), with the proportion of participants in the good knowledge category rising from 0% to 50.0%. In conclusion, the complementary education program effectively improved students' reproductive health knowledge and is recommended for replication and integration into the school health curriculum.</i>



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INTRODUCTION

Adolescent girls represent a vulnerable group facing three interrelated reproductive health risks: inadequate nutrition, iron-deficiency anemia, and suboptimal menstrual hygiene practices. National data indicate that anemia prevalence among Indonesian adolescent girls reaches 32.4%, higher than the global average, while only 30.4% of adolescent girls consume a diverse diet in line with balanced nutrition guidelines (Badan Penelitian dan Pengembangan Kesehatan, 2023). At the provincial level, anemia prevalence among adolescent girls in West Sumatra is estimated at 28–35%, higher than the average of other provinces on Sumatra Island (Suryani & Simbolon, 2023), consistent with findings that nutritional knowledge and dietary patterns significantly contribute to anemia incidence among senior high school students (Nasution & Simbolon, 2023).

Beyond nutrition and anemia, menstrual health is also a major concern: more than 40% of adolescent girls experience unmanaged dysmenorrhea, and around 65% still have limited knowledge of menstrual hygiene. Digital and interactive education programs have been reported to effectively improve adolescent girls' knowledge of menstrual health (Pratiwi & Kusumawati, 2022). The standards for hemoglobin levels and micronutrient requirements used as references for the nutrition and anemia education materials in this activity refer to applicable international and national guidelines (World Health Organization, 2022; Kementerian Kesehatan RI, 2014). These three aspects — nutrition, anemia, and menstrual health — are physiologically interconnected: iron and vitamin C deficiency worsens anemia, while unmanaged anemia increases susceptibility to infection and reduces quality of life during menstruation (Almatsier, Soetardjo, & Soekatri, 2021).

SMA Negeri 5 Padang is a senior high school in Padang City with a substantial population of female students who had not previously received an integrated reproductive health education program combining nutrition, anemia, and menstrual health. Various health education activities for adolescent girls have demonstrated effectiveness in improving knowledge, whether through printed media, digital media, or peer education approaches (Wirapuspita & Indiyah, 2022). However, most of these activities focus on a single topic in isolation, whereas the three topics are conceptually interrelated and ideally delivered in an integrated manner. This gap motivated the Community Service Team of the Midwifery Study Program, Universitas Baiturrahmah, to implement a complementary education program integrating all three topics within one structured series of activities. This community service activity aimed to improve the reproductive health knowledge of female students at SMA Negeri 5 Padang through a complementary nutrition, anemia, and menstrual health education program, evaluated by comparing knowledge scores before and after the intervention.

METHODS

This community service activity was implemented by the Community Service Team of the Midwifery Study Program, Universitas Baiturrahmah, at SMA Negeri 5 Padang, using a one-group pre-test/post-test evaluative approach in which knowledge was measured in the same target group before and after the education was delivered. The target audience consisted of female students in grades X and XI of SMA Negeri 5 Padang. A total of 30 students participated, selected through purposive sampling with the inclusion criteria of being a female student in grade X or

XI, willing to attend at least 80% of the eight sessions, and having obtained written informed consent from a parent or guardian.

The activity was carried out in August 2026 at SMA Negeri 5 Padang and consisted of eight structured education sessions held twice a week over four weeks, each lasting 90–120 minutes, using interactive lectures, group discussion, and practical demonstration delivered by the lecturer team together with two midwifery students. The material was arranged progressively across three domains: balanced nutrition for adolescent girls (2 sessions), anemia prevention (2 sessions), menstrual health and hygiene including dysmenorrhea management (3 sessions), and an evaluation and myth-versus-fact session (1 session). Each session was supported by a thematic leaflet developed by the service team and distributed to participants. The overall flow of activities is presented in Figure 1.



Figure 1. Flow Chart of Community Service Activity Implementation

Participants' knowledge was measured using a 30-item multiple-choice questionnaire (options A–D) that had been tested for validity ($r > 0.3$) and reliability ($\alpha > 0.7$), consisting of three sections of 10 items each: balanced nutrition, anemia, and menstrual health. The same instrument was administered as a pre-test (before the first session) and a post-test (after the final session). The knowledge score was calculated as the number of correct answers divided by 30, multiplied by 100, with interpretation categories of good (80–100), fair (60–79), and poor (< 60). Data were analyzed descriptively (mean, standard deviation, and category distribution) and the difference between pre-test and post-test scores was tested using the paired t-test, supported by the Wilcoxon signed-rank test, at a significance level of $p < 0.05$. The effectiveness of the knowledge improvement was further calculated using the normalized gain (N-Gain) with Hake's formula, categorized as high (≥ 0.7), moderate (0.3–0.7), and low (< 0.3). This activity observed the ethical principles of community service involving adolescents, including school approval, written informed consent from parents/guardians, confidentiality of participant data, and the right of participants to withdraw without consequence.

RESULT AND DISCUSSION

The community service activity involved 30 participants, female students of SMA Negeri 5 Padang from four classes. The distribution of participants by class is presented in Table 1, with the largest proportion coming from class X.E3 (46.7%).

Table 1. Distribution of Participants by Class (n=30)

Class	n	%
X.E2	4	13.3
X.E3	14	46.7
X.E6	7	23.3
XI.F5	5	16.7
Total	30	100.0

The activity was delivered through eight face-to-face sessions combining lectures, group discussion, and practical demonstration (Figure 2), supported by presentation slides and thematic leaflets developed by the service team (Figure 3). At the end of the program, participants and the service team documented the closing session together (Figure 4).



Figure 2. Delivery of Health Education Session to Participants



Figure 3. Presentation of “Gen Z Sehat Reproduksi” Program Material



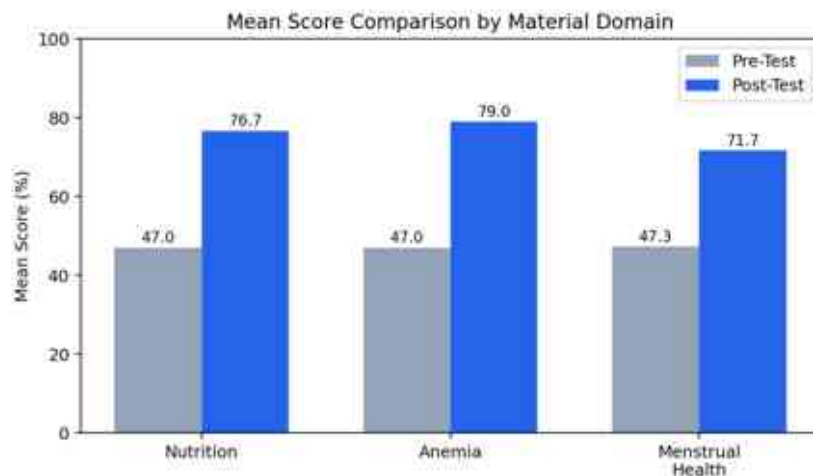
Figure 4. Documentation of Participants and the Community Service Team at the Closing Session

A comparison of knowledge scores before and after the intervention for each material domain and the total score is presented in Table 2. The paired t-test results show a statistically significant increase across all material domains ($p < 0.001$).

Table 2. Comparison of Pre-Test and Post-Test Knowledge Scores by Material Domain (n=30)

Variable	Pre-Test (Mean±SD)	Post-Test (Mean±SD)	Difference	p-value
Balanced Nutrition (score 0–100)	47.0 ± 15.8	76.7 ± 14.9	+29.7	<0.001*
Anemia (score 0–100)	47.0 ± 17.2	79.0 ± 13.6	+32.0	<0.001*
Menstrual Health (score 0–100)	47.3 ± 16.5	71.7 ± 18.1	+24.3	<0.001*
Total Knowledge Score (0–100)	47.11 ± 14.32	75.78 ± 15.06	+28.67	<0.001*

The total knowledge score increased from a mean of 47.11 (poor category) to 75.78 (fair category, approaching good), with an N-Gain of 0.54 (moderate category). Of the 30 participants, 27 (90.0%) showed an increase in score, 2 (6.7%) showed a decrease, and 1 (3.3%) remained unchanged. The improvement across the three material domains is shown in Figure 5, where the anemia domain showed the largest gain (+32.0 points), followed by balanced nutrition (+29.7 points) and menstrual health (+24.3 points).

**Figure 5. Graph of Mean Pre-Test and Post-Test Score Improvement by Material Domain**

These results are consistent with previous community service and health education activities that reported the effectiveness of peer-education-based health education in improving adolescent girls' reproductive health knowledge (Wirapuspita & Indiyah, 2022), as well as activities showing that a mixed media education intervention program significantly improved adolescent girls' knowledge and attitudes regarding iron-deficiency anemia (Agiani Putri, Neherta, & Fajria, 2023). Consistency of findings in the nutrition domain is further supported by evidence that comic- and leaflet-based education effectively improved adolescent girls' anemia knowledge (Hannanti, Ilmi, & Syah, 2021), in line with the significant improvement observed in this activity's nutrition (+29.7 points) and anemia (+32.0 points) domains.

The menstrual health domain in this activity showed a significant increase but a relatively lower final score (71.7%) compared to the other two domains. A similar pattern was reported in a balanced nutrition education program that found variation in the magnitude of improvement across material topics depending on their complexity and participants' familiarity with the topic (Maryati & Riya, 2023). The relatively lower achievement on the menstruation topic is presumed to be related to the sociocultural stigma that remains strong around this subject, as also noted in a systematic review of digital menstrual health education programs, which recommended a more personal and repeated approach for sensitive topics of this kind (Pratiwi & Kusumawati, 2022).

The printed media (leaflet) education method used in this activity proved effective, consistent with activities using booklet media to improve knowledge and attitudes toward anemia prevention among students (Imanuna, 2022), as well as other nutrition and anemia education activities that also reported meaningful knowledge improvement (Djannah & Wisudawati, 2023). Although recent activities have explored interactive digital media such as animated videos (Yulianti et al., 2026) or TikTok (Nabila, Triyanto, & Swasti, 2023) for anemia education, the results of this activity show that structured face-to-face education (interactive lectures, discussion, and demonstration) combined with simple printed media can achieve comparable effectiveness, with the advantage of lower implementation cost and no requirement for specific digital devices.

The finding that 90.0% of participants showed an increase in score further supports the association between adolescent girls' knowledge of anemia and their preventive behavior, as reported in an earlier activity that found a correlation between knowledge level and anemia prevention behavior during menstruation (Mularsih, 2017). A limitation of this activity is the one-group pre-test/post-test evaluation design without a control group, so the possible influence of external factors (such as information exposure from other sources during the intervention period) on the score increase cannot be fully controlled; a follow-up community service activity with a control group design could be considered to strengthen the evidence of the program's impact.

CONCLUSION AND SUGGESTIONS

This community service activity, a complementary balanced nutrition, anemia prevention, and menstrual health education program, effectively improved the reproductive health knowledge of female students at SMA Negeri 5 Padang, shown by a mean knowledge score increase of 28.67 points (from 47.11 to 75.78) that was statistically significant ($p < 0.001$) with a moderate N-Gain (0.54), and a shift in knowledge category distribution from predominantly poor (73.3%) to predominantly good and fair (90.0% combined). Based on these results, it is recommended that SMA Negeri 5 Padang and local health workers replicate similar complementary education programs periodically and integrate them into the school health curriculum, with additional emphasis on the menstrual health topic given its relatively lower achievement, and that a follow-up community service activity with medium-term knowledge retention measurement be conducted to strengthen the sustainability of the program's impact.

DAFTAR PUSTAKA

- Agiani Putri, S., Neherta, M., & Fajria, L. (2023). Pengaruh pendidikan kesehatan dengan mixed media education intervention program terhadap pengetahuan dan sikap remaja putri tentang anemia gizi besi. *Jurnal Ners Indonesia*, 14(1), 47–60. <https://doi.org/10.31258/jni.14.1.47-60>
- Almatsier, S., Soetardjo, S., & Soekatri, M. (2021). *Gizi seimbang dalam daur kehidupan*. Jakarta, Indonesia: PT Gramedia Pustaka Utama.

- Badan Penelitian dan Pengembangan Kesehatan. (2023). Riset kesehatan dasar (Riskesdas) 2023. Jakarta, Indonesia: Kementerian Kesehatan Republik Indonesia.
- Djannah, R., & Wisudawati, W. (2023). Pengaruh pendidikan gizi dan anemia terhadap pengetahuan remaja tentang pencegahan anemia. *Jurnal Ilmu Kesehatan Karya Bunda Husada*, 9(1), 10–17. <https://doi.org/10.56861/jikkbh.v9i1.105>
- Hannanti, H., Ilmi, I. M. B., & Syah, M. N. H. (2021). Pengaruh edukasi gizi melalui komik dan leaflet terhadap peningkatan pengetahuan terkait anemia pada remaja putri di SMA Negeri 14 Jakarta. *Jurnal Gizi dan Kesehatan*, 13(1), 40–53. <https://doi.org/10.35473/jgk.v13i1.85>
- Imanuna, H. (2022). Penyuluhan anemia gizi besi menggunakan media booklet untuk meningkatkan pengetahuan dan sikap siswi SMAN 7 Malang. *Nutriture Journal*, 1(1), 1. <https://doi.org/10.31290/nj.v1i1.3526>
- Kementerian Kesehatan RI. (2014). Pedoman gizi seimbang. Jakarta, Indonesia: Kementerian Kesehatan RI. Retrieved from <https://kemkes.go.id>
- Maryati, A., & Riya, R. (2023). Pengaruh edukasi gizi seimbang terhadap pengetahuan dan sikap remaja di SMP N 19 Muaro Jambi. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 6(6), 1157–1163. <https://doi.org/10.56338/mppki.v6i6.3332>
- Mularsih, S. (2017). Hubungan pengetahuan remaja putri tentang anemia dengan perilaku pencegahan anemia pada saat menstruasi di SMK Nusa Bhakti Kota Semarang. *Jurnal Kebidanan*, 6(2), 80–85. <https://doi.org/10.26714/jk.6.2.2017.80-85>
- Nabila, P. S., Triyanto, E., & Swasti, K. G. (2023). Edukasi menggunakan media TikTok meningkatkan pengetahuan dan sikap pencegahan anemia pada remaja putri. *Jurnal Sains Kebidanan*, 5(2), 43–49. Retrieved from <http://ejournal.poltekkes-smg.ac.id/ojs/index.php/JSK/>
- Nasution, Z., & Simbolon, D. (2023). Faktor-faktor yang berhubungan dengan kejadian anemia pada remaja putri di sekolah menengah atas. *Jurnal Gizi Pangan*, 18(1), 31–40. Retrieved from <https://journal.ipb.ac.id/index.php/jgizipangan>
- Pratiwi, A. M., & Kusumawati, Y. (2022). Program edukasi kesehatan menstruasi berbasis digital pada remaja putri: Systematic review. *Jurnal Kesehatan Reproduksi*, 13(1), 22–35. Retrieved from <https://ejournal.almaata.ac.id/index.php/JNKI>
- Suryani, E., & Simbolon, D. (2023). Faktor risiko anemia pada remaja putri di Sumatera Barat. *Jurnal Kesehatan Masyarakat*, 11(2), 88–99. Retrieved from <https://ejournal3.undip.ac.id/index.php/jkm>
- Wirapusrita, R., & Indiyah. (2022). Efektivitas pendidikan kesehatan berbasis peer education terhadap pengetahuan kesehatan reproduksi remaja putri. *Jurnal*

Kesehatan Masyarakat, 10(2), 145–154. Retrieved from <https://ejournal3.undip.ac.id/index.php/jkm>

World Health Organization. (2022). WHO guideline on use of ferritin concentrations to assess iron status in populations. Geneva, Switzerland: WHO. Retrieved from <https://www.who.int>

Yulianti, D. M., Oliy, N., Nurhidayah, N., Pombaile, V. D., Anggraeni, N. M. D., & Arbie, R. S. (2026). Efektivitas edukasi anemia berbasis video animasi terhadap pengetahuan dan sikap remaja putri tentang tablet tambah darah. *Holistik Jurnal Kesehatan*, 20(1), 262–269. <https://doi.org/10.33024/hjk.v18i9.2485>