ORIGINAL ARTICLE

Acceptability of Iron Supplementation Program at Islamic Boarding Schools in East Java Indonesia

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ABSTRACT

Introduction: Iron deficiency anaemia remains a public health issue in Indonesia. The Indonesian government initiated an Iron Supplementation Program, targeting pregnant and reproductive-age women, including those residing in Islamic boarding schools. This study aimed to determine the acceptability of the Iron Supplementation Program implementation in Islamic boarding schools in East Java from the perspective of the school administrators. **Materials and methods:** This study utilized a quantitative descriptive design and a cross-sectional study approach. The study used convenience sampling to collect data from 95 Islamic boarding schools in East Java, Indonesia. Data was collected using questionnaire-guided interviews. A questionnaire assessed program availability, implementation, and acceptability based on Theoretical Framework of Acceptability. **Results:** The total respondents were 95. The findings indicate active participation from Islamic boarding schools in the implementation process of the Iron Supplementation Program, particularly in receiving iron supplementation tablets by PHC, scheduling, and involvement of internal stakeholders. However, discrepancies were noted in program execution, such as inadequate record-keeping and reporting, deviating from guidelines. The acceptability level was relatively high (97.90%). The indicator with the highest frequency was opportunity cost (97.90%), while the lowest frequency was self-efficacy (76.80%). **Conclusion:** The implementation process in Islamic boarding schools demonstrated active participation from various stakeholders and a high level of program acceptability. Nevertheless, there were some implementation aspects not aligned with the Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of Reproductive Age, particularly in reporting and record-keeping.
Malaysian Journal of Medicine and Health Sciences (2025) 21(SUPP7): 20-27. doi:10.47836/mjmhs.21.s7.3

Keywords: Acceptability, Islamic boarding schools, Anaemia, Iron supplementation program

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INTRODUCTION

Anaemia is a bodily condition characterized by low levels of haemoglobin (Hb), with values less than 12g/dL in the body (1). Globally, the World Health Organization (WHO) reported that in 2019, 269 million children suffered from anaemia, with the prevalence of anaemia in non-pregnant women aged 15-49 years reaching 29.9% (2). The same findings are also evident in the study by Gardner et al., which indicates that anaemia has affected 1.74 billion (22.8%) of the world's population, with 305 million (25.4%) of them being school-age children (3). The global prevalence indicates figures that are not significantly different from the conditions in Indonesia, based on the report on Result of Indonesia Health Survey (SKI) 2023, which recorded 15,5% of adolescent girls aged 15-24 years suffer from anaemia (4). Furthermore, the situation in East Java, according to the SKI 2018, shows that the prevalence of anaemia among adolescent girls (junior high school to high school) is 5.8%, which means that 6 out of 100 adolescents suffer from anaemia.

Adolescent girls is one of the vulnerable groups, as they are at an age where rapid physical growth and physiological changes occur, necessitating high nutritional needs (5). If nutritional problems such as anaemia is not promptly addressed in adolescent girls, it will have implications on their pregnancy and childbirth processes when they reach adulthood (6). Anaemia occurring during pregnancy leads to occurrences of Low Birth Weight (LBW) and stunting. This is supported by a study by Wahyuni et al., which indicates that 92.3% of

pregnant women with anaemia experience occurrences of LBW (7). Such conditions also impact infant mortality. For example, the East Java Health Office report for the year 2021 explains that there were 987 cases of infant deaths caused by LBW (8). Additionally, the potential for stunting also occurs in pregnant women suffering from anaemia. Furthermore, Nadhiroh et al., explained in their research that stunting in children is related to anaemia in pregnant women (9).

To address the issue of anaemia, the Indonesian Ministry of Health has issued a policy for community nutrition improvement programs, one of which includes providing iron supplementation tablets for adolescent girls. The iron supplementation program is aimed at adolescent girls aged 12-18 years who are in junior high school and senior high school, with a dose of one tablet per week for 52 weeks containing 60 mg of elemental iron (10).

According to the result of Indonesia Health Survey (SKI) in 2023, the proportion of adolescent girls who consumed >52 iron supplementation in one year was only 4.2% (obtained from health facilities), 3.0% (obtained from schools), and 4.3% (obtained from their own initiative) (4). This indicated that the routine consumption of iron supplementation tablets was still low. Suboptimal implementation of iron supplementation tablets program also occurs in Islamic boarding schools. Islamic boarding schools have distinct characteristics that present challenges in implementing health programs such as iron supplementation. Unlike general boarding schools, Islamic boarding schools integrate religious and general academic education, emphasizing Islamic teachings significantly. Despite having this program, research by Purwandari indicated that 84 (80%) female students (santriwati) still suffered from anaemia at Darussalam Islamic Boarding School in Kepung, Kediri (11). Similar results were found in a study by Hamidiyah et al., conducted in Situbondo, where the prevalence of anaemia among female students was 79% (12). Female students are vulnerable to anaemia because their daily lives in Islamic boarding schools, away from their parents, and the packed schedule of daily activities result in irregular eating patterns and a lack of quality nutrition intake (13). The strict rules of Islamic boarding schools, such as scheduled rest times, limited food portions, and nutrient distribution at specific times, emphasize the need to pay attention to the health of female students.

Pesantren Health Posts (Poskestren) play a significant role in supporting the iron supplementation program in Indonesia, particularly within Islamic boarding schools. These health posts are responsible for promoting health education and ensuring proper implementation of the program. Poskestren also facilitates coordination between health workers, school staff, and religious leaders to enhance program effectiveness and community acceptance.

Nonetheless, the iron tablet program is not compulsory for all schools. While the Indonesian government supports and promotes the program, its implementation can vary based on school participation, availability of resources, and local coordination efforts. Some schools may not participate due to logistical challenges, administrative decisions, or lack of resources, even if they are near a Pesantren Health Post (Poskestren) (14,15).

In this program, there are several steps or processes that need to be done by the school. It begins with the distribution of iron tablets weekly in schools, typically on a fixed day. Then the teachers need to supervise its consumption, provide management instructions for side effects, and maintain records. The program also includes health and nutrition education integrated into the school curriculum and employs behaviour change campaigns to raise awareness and demand for the supplements. The implementation of program depends on various factors, including the school's participation in the program, the level of coordination between the school and the health post, and the availability of resources. It is possible for a school in the vicinity of a Pesantren Health Post (Poskestren) not to have the iron tablet program. Therefore, while the Poskestren can play a crucial role in distributing and supervising the iron tablets, not all schools may be involved in the program due to logistical, administrative, or resource constraints (14,15).

As the program requires effort and commitment of many parties such as the Pesantren Health Posts (Poskestren) and more importantly the school administrator (kyai/ cleric, management, ustadz/ustadzah), the acceptability of the program need to be evaluated. The program's acceptability among school administrators is critical to its successful implementation and sustainability. As key stakeholders, school administrators shape institutional policies and oversee health-related interventions, including the iron supplementation tablets program. Acceptability from school administrators can help integrate the program into the Islamic boarding school system (16). Without support and alignment with program objectives, logistical and operational challenges may arise, potentially hampering the effectiveness and sustainability of the iron supplementation tablets program (17).

Sekhon et al., defined acceptability as a multi-faceted construct that provides an overview of the extent to which health intervention providers consider the program appropriate, based on the cognitive and emotional responses experienced regarding the program (18). This is manifested in the theoretical framework of acceptability (TAF), which consists of affective attitudes, ethics, burden, opportunity costs, perceived effectiveness, self-efficacy, and intervention coherence (18). High acceptability is indicated by positive responses across these areas. The TAF framework is

useful in evaluating health interventions, as it provides a comprehensive approach not only to understand whether an intervention is acceptable, but also the factors that influence acceptability. Applying this framework in the evaluation of iron tablet supplementation programs in pesantren is important, as it allows for an assessment of stakeholder responses. There needs to be more research that evaluates the acceptability of iron tablet supplementation programs in pesantren using the Theoretical Framework of Acceptability (TAF) approach, especially from the perspective of Islamic boarding schools to support implementation in an environment with different characteristics from other boarding schools.

Therefore this study aims to provide a descriptive overview the availability of program, the availability of Pesantren Health Posts (Poskestren), the processes undertaken by the schools with regards to the program's implementation, the individuals involved in the implementation of the program at the school level, and acceptability of the iron supplementation tablet program among the administrators, using the theoretical framework of acceptability (TAF) in Islamic boarding schools in East Java, Indonesia.

MATERIALS AND METHODS

Research Design

This study utilizes a quantitative descriptive design with a cross-sectional study approach.

Sampling

The study employed a non-probability sampling method, namely convenience sampling. Calculated sample size were 95 Islamic boarding schools by using Cochran's Formula. Form 38 cities in East Jawa, Indonesia, 2-3 Islamic boarding schools were selected in each city. One respondent per school was selected. The respondents were the school administrators involved in the iron supplementation tablet program. The inclusion criteria for data collection were that the Islamic boarding schools had female students residing in them. The exclusion criteria included islamic boarding schools with limited accessibility for data collection or those that declined participation.

Data Collection

The data collection was conducted at Islamic boarding schools in East Java, Indonesia. Primary data was collected through questionnaire-guided interviews from April 29th to May 3rd, 2024. Interviews were conducted face-to-face in designated areas within the Islamic boarding school to ensure a conducive and private environment. Each session lasted approximately 30–45 minutes.

The questionnaire collected data on the availability of the program and Pesantren Health Posts (Poskestren), implementation processes of the program based on current guidelines, individuals who are involved in the implementation process of the program, and a TFA acceptability questionnaire. The TFA questionnaire included eight items: one item for each acceptability construct (affective attitude, burden, ethicality, opportunity cost, perceived effectiveness, self-efficacy, intervention coherence) and one global item measuring overall acceptability. Responses were rated on a 4-point Likert scale. The higher the score, the more positive the response. Efforts were made to minimize response bias by training interviewers on standardized questionnaire administration procedures. Before each interview, a briefing session was conducted to clarify the purpose of the questionnaire and address any participant inquiries.

Ethical Clearance

This study has obtained approval from the Research Ethical Clearance Commission of the Faculty of Dentistry, Universitas Airlangga, with the approval number 0422/HRECC.FODM/IV/2024.

RESULTS

The data collection results can be seen from the returned and usable questionnaires. The comparison between the percentage of completed and distributed questionnaires can be called the response rate. The research data was obtained by interviewing school administrators in Islamic boarding schools. The number of questionnaires distributed was 95. Of that number, the questionnaires answered (response rate) by respondents were 95 questionnaires, and all were worthy of analysis.

Frequency data of the characteristics of Islamic boarding schools are presented, detailing the availability of Pesantren Health Posts (Poskestren) and the Iron Supplementation Tablet Program, as shown in Table I below.

Based on the data in Table I, 77 out of 95 Islamic boarding schools (81.3%) have the iron tablet program. Also, Islamic boarding schools without Poskestren tend not to have the Iron Supplementation Tablet Program, with a percentage of 33.3%.

The variety of program implementation processes can be found in Table II below.

Of the 77 schools that have the iron tablet supplementation program, most of them (n=55, 71.4%) were deemed to require iron tablets by the primary healthcare service as opposed to having to request for the tablets (26%) or having to buy them (2.6%). Most of the schools ensured that the iron supplementation tablets meet their needs (68%), while a third merely accepted whatever was provided. Most schools also have scheduled reception of tablets from the PHC (78.6%) and scheduled weekly distribution to the students (63.6%). However, record-

keeping status of the program were rather poor, where only 42.9% of schools keep proper record of the program and only 32.5% provide program report regularly.

The individuals who are involved in the implementation process of the program within the Islamic boarding schools, are as shown in Table III.

Table I: Availability of Pesantren Health Posts (Poskestren) and the Iron Supplementation Tablet Program

The Islamic Boarding Schools Have Poskestren	The Islamic Boarding Schools Have the Iron Supplementation Tablet Program (n=95)				Total	
	Yes		No			
	Frequency	%	Frequency	%	Frequency	%
Yes	57	87.7	8	12.3	65	100.0
No	20	66.7	10	33.3	30	100.0
Total	77	81.3	18	18.8	95	100.0

Table II: Implementation Processes of the Iron Supplementation Tablet Program in Islamic Boarding Schools in East Java, Indonesia (n=77)

Phenomenon	N	%
Planning for Iron Supplementation Tablet Needs		
Iron supplementation tablets are determined by the primary healthcare (PHC)	55	71.4
Iron supplementation tablets are requested by the Islamic boarding schools to the PHC	20	26.0
Iron supplementation tablets are purchased independently by the Islamic boarding schools.	2	2.6
Islamic Boarding Schools Receiving Iron Supplementation Tablets From the PHC (n=75)		
a. The Process of Receiving Iron Supplementation Tablets from the PHC		
The Islamic boarding schools ensure that the iron supplementation tablets meet their needs.	51	68.0
The Islamic boarding schools accept whatever is provided	24	32.0
b. The Timing of Receiving Iron Supplementation Tablets From the PHC		
Scheduled by the PHC	59	78.6
Not scheduled by the PHC	16	21.4
Implementation of the Iron Supplementation Tablet Program by Islamic Boarding Schools		
Determining the day for collective intake every week	49	63.6
Just distribute to female students	28	36.4
Recording of the Iron Supplementation Tablet program by the Islamic Boarding Schools		
The Islamic boarding schools conduct recording	33	42.9
The Islamic boarding schools rely on the recording from the PHC	21	27.3
No recording conducted	23	29.9
Reporting of the Iron Supplementation Tablet Program		
Reported of the iron supplementation tablet program	25	32.5
Report to the PHC if requested	52	67.5

Table III: The Individuals who are Involved in the Implementation Process of the Program Within the Islamic Boarding Schools

Individuals	N	%
Management	58	24.4
Ustadz/Ustadzah	52	21.8
Health Division (Poskestren)	49	20.6
Dormitory Supervisor	43	18.1
Head of the Islamic Boarding School (Kyai)	32	13.4
Female Students (Santriwati)	4	1.7

The iron supplementation tablet program was predominantly led by the management, 24.4% (58 schools), followed by the religious teachers (Ustadz/ Ustadzah) comprising 21.8% (52 schools).

Based on the TFA acceptability questionnaire, the acceptability level was very high (almost 98%), with all the constructs also having high scores (77%-98%), as shown in Figure 1.

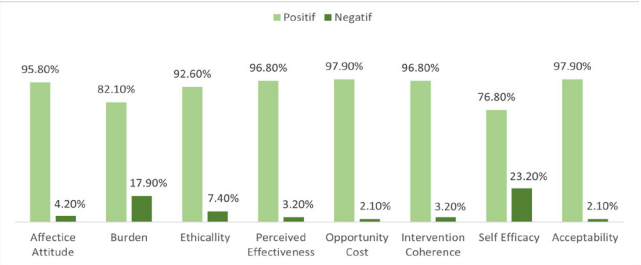

Figure 1: The Distribution of Scores for the Constructs of TAF

DISCUSSION

Availability of Poskestren and the Iron Supplementation Tablet Program

Poskestren formulate health policies within the Islamic boarding schools. In this study, Islamic boarding schools without Poskestren tended not to have the Iron Supplementation Tablet program. Research conducted by Mardliyah et al., states that the existence of Poskestren supports health policies in Islamic boarding schools such as morning exercise every Friday, collective iron supplementation tablet intake every Friday, and health examinations for all students by Poskestren cadres (19). However, the number of Poskestren in East Java, based on data cited from the East Java Provincial Information and Communication in 2024, is only 36.56% (1,526) of the total number of Islamic boarding schools available (20).

Implementation of the Iron Supplementation Tablet Program

As for the process of planning the need for iron supplementation tablets in Islamic boarding schools, the response was dominated by PHC (Public Health Centre) determining the need for iron supplementation tablets in Islamic boarding schools at 71.4% (55 Islamic boarding schools). This is in accordance with the Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of Reproductive Age (WUS) issued by Indonesian Ministry of Health (10). The guideline regulates the planning of iron supplementation tablets needs, including in educational institutions, where the planning is carried out by the PHC by calculating the target based on the latest Basic Education Data (DAPODIK).

There are Islamic boarding schools that submitted their iron supplementation tablets needs to the PHC at 26.0% (20 Islamic boarding schools) and Islamic boarding schools that purchased iron supplementation tablets independently at 2.6% (2 Islamic boarding schools). Islamic boarding schools that submitted their needs to the PHC or purchased iron supplementation tablets independently demonstrate active participation in the program. This indicated that the Islamic boarding schools consider the program relevant and important for the needs of female students. In line with the concept of acceptability by Sekhon et al., one of the indicators is perceived effectiveness (18), which refers to the program's perceived ability to achieve its goals and meet needs. This indicated a tendency towards high acceptability among Islamic boarding schools regarding the program.

The process of receiving iron supplementation tablets from the PHC was predominantly characterized by the Islamic boarding schools ensuring that the tablets matched the number of their female students, at 68.0% (51 Islamic boarding schools). This indicated that the Islamic boarding schools actively participated and taken responsibility for the health of their female students by ensuring the availability of adequate tablets. The timing of iron supplementation tablets receipt at Islamic boarding schools was mostly scheduled by the PHC, at 78.4% (58 Islamic boarding schools). Scheduled distribution by the PHC, helped Islamic boarding schools avoid stock shortages and ensures consistent availability of iron supplementation tablets, thereby enhancing the program's acceptability.

The implementation of the iron supplementation tablets program by Islamic boarding schools was mostly carried out by creating a collective intake schedule every week, 63.6% (49 Islamic boarding schools), while 36.4% (28 Islamic boarding schools) of Islamic boarding schools only distributed iron supplementation tablets to their female students. There was still inconsistency among Islamic boarding schools in implementing the program. Islamic boarding schools that only distributed iron supplementation tablets may reduce the utilization of iron supplementation tablets by their female students, which could risk some of them not consuming iron supplementation tablets properly. This can lead to the ineffectiveness of the program. The implementation of the iron supplementation tablets program that is scheduled and conducted collectively can foster solidarity and promote healthy behaviours (21). This is in line with Notoadmodjo, who explained that situational factors, including the environment where an individual lives, whether physical, social, cultural, economic, or political, have an impact on individual behaviour (22).

The involvement of individuals of the Islamic boarding schools were dominated by the Islamic boarding school management at 24.4% (58 Islamic boarding schools), followed by religious teachers (Ustadz/Ustadzah) at 21.8% (52 Islamic boarding schools), and the Health Division at 20.6% (49 Islamic boarding schools). This involvement indicated that Islamic boarding schools have actively participated across sectors in this program. Internal support can also enhance the success of the program, as evidenced by the research results of Nuradhiani et al., which show that teacher support increases compliance with iron supplementation tablet intake by 4.7 times (19).

It was also observed that most Islamic boarding schools undertook program recording, 42.9% (33 Islamic boarding schools), while the remainder relied on the PHC for recording at 27.3% (21 Islamic boarding schools), and there are Islamic boarding schools that do not perform any recording at 29.9% (23 Islamic boarding schools). Reliance on the PHC for recording, or even the absence of program recording altogether, indicated that the recording process had not yet been routinely established by Islamic boarding schools. According to the Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of

Reproductive Age (WUS), recording can be conducted by the implementing team in the respective institution; in this case, Islamic boarding schools can undertake recording as an additional task (10). Recording can be done on nutritional supplementation cards or in health record books. In this context, there is still a discrepancy with the guidelines, as recording should be a mandatory practice for Islamic boarding schools to measure the sustainability of the programs undertaken.

The iron supplementation tablets program is one of the programs monitored by PHC, thus reporting on the program's sustainability needs to be carried out by each Islamic boarding school. Most Islamic boarding schools, 67.5% (52 Islamic boarding schools) only reported to the PHC when requested, while the remaining 32.5% (25 Islamic boarding schools) regularly reported on the program to the community health center. There was a discrepancy in reporting practices conducted by Islamic boarding schools compared to the Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of Reproductive Age (WUS), which stipulates that Islamic boarding schools should report every 3 months (10). Regular reporting processes carried out by Islamic boarding schools can assist PHC in evaluating the program, thus enabling analysis of issues, and in the following months, the PHC can devise follow-up steps to improve the achievement of the iron supplementation tablets program (21).

The Acceptability of Iron Supplementation Program

The assessment results of Islamic boarding schools regarding the Iron Supplementation Program, based on the theoretical framework of acceptability, indicated an acceptability rate of 97.90%, signifying a high level of acceptance within this study. Only 2.10% of Islamic boarding schools exhibited low acceptability or were unable to fully embrace the program. Regarding the Islamic boarding schools, positive self-efficacy accounted for 76.80%, representing the smallest indicator value, while negative self-efficacy reached 23.20%, representing the largest value. This contributes to the assessment, as Islamic boarding schools tend to lack confidence in ensuring their female students consistently adhere to the Iron Supplementation Program. The hesitancy of Islamic boarding schools reflects their commitment to actively participate in the program, as evidenced by studies showing that school commitments and policies impact the consumption of iron supplements among adolescent girls (17).

The lack of confidence among Islamic boarding schools in implementing the Iron Supplementation Program may arise due to several factors. Limited access to information received by the Islamic boarding schools may lead them to neglect the importance of the program, as explained by Notoadmodjo, who emphasizes that acquired information forms the cognitive basis for individuals (22). Furthermore, the Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of Childbearing Age (WUS) stipulate that educational institutions are tertiary targets, necessitating health promotion efforts related to anaemia among program implementers, not just female students (10).

In the theoretical framework of acceptability, the positive opportunity cost in the Iron Supplementation Program at Islamic boarding schools holds the highest value at 97.90%. In this study, opportunity cost is interpreted as the program not interfering with the priorities of other programs. The acceptance of Islamic boarding schools regarding opportunity cost occurs when the Iron Supplementation Program is perceived to provide greater benefits than the costs incurred. This aligns with Siswati et al., indicating that opportunity cost programs can occur when resources used to establish a program yield more significant benefits (24).

Research Limitations

This research only provides an overview of the implementation and the level of acceptability among Islamic boarding schools. However, a more in-depth investigation to identify the factors that support or hinder the acceptability of the Iron Supplementation Program has not been conducted. Further research could employ a stratified random sampling technique to gather data, allowing for a more comprehensive representation of various characteristics of Islamic boarding schools.

CONCLUSION

It can be concluded that, in the context of this research, the implementation process of the Iron Supplementation Program demonstrated active participation from the Islamic boarding schools in the study location and population, both in the receiving iron supplementation tablets by PHC, determination of Iron Supplementation consumption schedules, and involvement of internal stakeholders. However, there are still inconsistencies in program execution, such as program documentation and reporting that do not align with existing guidelines. The level of acceptance of the Iron Supplementation Program is quite high (97.90%). The indicator with the highest frequency value is Opportunity Cost (97.90%), while the lowest frequency value is self-efficacy (76.80%).

ACKNOWLEDGEMENT

We thank the Islamic boarding schools in East Java for providing insights and sharing their experiences, greatly enriching our research findings.

REFERENCES

1. World Health Organization. Haemoglobin Concentrations for The Diagnosis of Anaemia and Assessment of Severity [Internet]. 2011. Available from: https://iris.who.int/bitstream/

handle/10665/85839/WHO_NMH_NHD_MNM_11.1_eng.pdf?ua=1.
2. World Health Organization. Anaemia in Women and Children [Internet]. 2021. Available from: https://www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children.
3. Gardner W, Kassebaum N. Global, regional, and national prevalence of anemia and its causes in 204 countries and territories, 1990–2019. Curr Dev Nutr. 2020;4(Supplement 2):830. doi:10.1093/cdn/nzaa053_035.
4. Ministry of Health of the Republic of Indonesia. The 2023 Indonesian Basic Health Survey. Jakarta; 2023.
5. Lestari S, Fujiati II, Eyanoer PC, Sari DK, Daulay M, Nasution NH. The Prevalence and Risk Factors of Anemia among Primary School Children in North Sumatera, Indonesia: In: Proceedings of the International Conference of Science, Technology, Engineering, Environmental and Ramification Researches. Medan, Indonesia: SCITEPRESS - Science and Technology Publications; 2018. p. 657–62. doi:10.5220/0010083006570662.
6. Pareek P, Hafiz A. A Study on anemia related knowledge among adolescent girls. Int J Nutr Food Sci. 2015;4(3):273. doi:10.11648/j.ijnfs.20150403.14.
7. Wahyuni S, Yustina Ananti, Chentia Misse Issabella. Pregnancy anemia relationship with the event of low birth weight (LBW): systematic literature review. J Health JoH. 2021;8(2):94–104. doi:10.30590/joh.v8n2.p94-104.2021.
8. East Java Provincial Health Office. East Java Health Profile 2021. Surabaya: East Java Provincial Health Office; 2022.
9. Nadhiroh SR, Micheala F, Tung SEH, Kustiawan TC. Association between maternal anemia and stunting in infants and children aged 0–60 months: a systematic literature review. Nutrition. 2023;115:112094. doi:10.1016/j.nut.2023.112094.
10. Ministry of Health of the Republic of Indonesia. Guidelines for the Prevention and Control of Anaemia in Adolescent Girls and Women of Reproductive Age. Kementerian Kesehatan Republik Indonesia; 2018.
11. Purwandari ES. Comparison anemia in adolescent girls who stay at pondok pesantren and at home in madrasah aliyah pondok pesantren darussalam Kepung Kediri. J Ilm Kebidanan Sci J Midwifery. 2018;4(2):114–9. doi:10.33023/jikeb.v4i2.191.
12. Hamidiyah A, Rohmani L, Zahro NA. Determinant factors of anemia female santri. OKSITOSIN J Ilm Kebidanan. 2019;6(1):64–72. doi:10.35316/oksitosin.v6i1.345.
13. Indraswari S, Achadi EL. The differences of haemoglobin changes between two methods of IFA supplementations among anemic female adolescent students of miftahul huda al azhar langgensari Islamic boarding school, West Java. Indones J Public Health Nutr. 2020;1(1). doi:10.7454/ijphn.v1i1.4379.
14. Roche ML, Bury L, Yusadiredja IN, Asri EK, Purwanti TS, Kusyuniati S, et al. Adolescent girls' nutrition and prevention of anaemia: a school based multisectoral collaboration in Indonesia. BMJ. 2018;363:k4541. doi:10.1136/bmj.k4541.
15. Hulaila A, Musthofa SB, Kusumawati A, Prabamurti PN. Analysis of pesantren health post implementation program at durrotu aswaja Islamic boarding school sekaran Gunungpati Semarang. Media Kesehat Masy Indones. 2021;20(1):12–8. doi:10.14710/mkmi.20.1.12-18.
16. Ansari MR, Kandarina BJ, Kusmayanti N, Fikrinnisa R. The acceptability of weekly iron-folic acid supplementation and its influencing factors among adolescent school girls in Yogyakarta city: a mixmethods study. Malays J Nutr. 2021;27(1). doi:10.31246/mjn-2020-0019.
17. Helmyati S, Syarifa CA, Rizana NA, Sitorus NL, Pratiwi D. Acceptance of iron supplementation program among adolescent girls in Indonesia: A Literature Review. Amerta Nutr. 2023;7(3SP):50–61. doi:10.20473/amnt.v7i3SP.2023.50-61.
18. Sekhon M, Cartwright M, Francis JJ. Acceptability of healthcare interventions: an overview of reviews and development of a theoretical framework. BMC Health Serv Res. 2017 Jan 26;17(1):88. doi:10.1186/s12913-017-2031-8.
19. Mardliyah IK, Rusli M, Purwanti S. Implementation of the santri husada programme for health independence at riyadlotut thalabah Islamic boarding school, Sedan, Rembang. LENTERNAL Learn Teach J. 2023;4(1):29–39. doi:10.32923/lenternal.v4i1.3256.
20. East Java Provincial Communication and Information Office. Dinas Komunikasi dan Informatika Provinsi Jawa Timur. 2024. Realising Healthy and Quality Pesantren, IKI PESAT East Java Programme Reaches 1,419 Ponpes. Available from: https://kominfo.jatimprov.go.id/berita/wujudkan-pesantren-yang-sehat-dan-berkualitas-program-iki-pesat-jatim-jangkau-1-419-ponpes.
21. Fitriana F, Pramardika D. Evaluation of blood-tableting programs in young women. MPPKI Media Publ Promosi Kesehat Indones Indones J Health Promot. 2019;2:200–7. doi:10.31934/mppki.v2i3.807
22. Notoatmodjo S. Health Promotion and Health Behavior. Jakarta: Rineka Cipta; 2007.
23. Nuradhiani A, Briawan D, Dwiriani CM. Teacher's support helps to increase compliance of iron supplementation on female adolescents in Bogor. J Gizi Dan Pangan. 2017;12(3):153–60. doi:10.25182/jgp.2017.12.3.153-160.
24. Siswati T, Maryuni E, Rahmawati L, Nugroho RS, Rialihanto MP, Olfah Y. Using the theoretical framework of acceptability for assessment of

the preventing teen pregnancy program: in the context of stunting reduction in Yogyakarta. J Kebijak Kesehat Indones JKKI. 2022;11(4):36–46. doi:10.22146/jkki.78303.