https://doi.org/10.20473/mgi.v17i1SP.90–96

DETERMINAN KEPATUHAN SUPLEMENTASI ZAT BESI PADA REMAJA PUTRI DALAM UPAYA INTERVENSI SPESIFIK PENCEGAHAN STUNTING: A SYSTEMATIC REVIEW

Determinant of Adherence to iron supplementation in Adolescent Girl in Specific Intervention for Stunting Prevention: Systematic Review

Alma Feriyanti[1] *, Nafiatus Sintya Deviatin[1], Ira Nurmala[1], Sri Widati[1], Dominikus Raditya Atmaka[2]
[1]Departemen Epidemiologi, Biostatistika, Kependudukan dan Promosi Kesehatan, Fakultas Kesehatan Masyarakat, Universitas Airlangga, Surabaya
[2]Departemen Gizi, Fakultas Kesehatan Masyarakat, Universitas Airlangga, Surabaya
*E-mail: alma.feriyanti-2021@fkm.unair.ac.id

ABSTRACT

An increase in the prevalence of anemia in young women will affect the quality of life and their offspring. Adolescent girls who experience anemia are at risk for anemia during pregnancy. Anemia in pregnant women will impact giving birth to stunted babies. Iron supplementation is a specific intervention effort to prevent anemia in female adolescents. This study aims to analyze the determinants of adherence to iron supplementation in young women and specific interventions to prevent stunting. This study uses a systematic review using PRISMA. Five electronic databases are used: Scopus, ScienceDirect, Wos, SAGE, and Google Scholar. The articles used in this research are 10 articles. The inclusion criteria for this study were articles published within five years, namely, 2018-2022, full text, open access, and in Indonesian and English. The determinants of adherence to iron supplementation are influenced by several factors, including sociodemographic factors such as the mother's occupation, education, and adolescent age. Intrapersonal factors such as young women's motivation and perceived benefits. Interpersonal factors such as support from parents, peers, and teachers. Institutional factors such as school support in the distribution of iron tablets. The compliance of young women in consuming iron tablets is influenced by sociodemographic, intrapersonal, intrapersonal, and institutional factors. There is a need for health education for young women and parents as well as strengthening commitment to schools so that they receive support in the implementation of iron supplementation as a specific intervention for stunting prevention

Keywords*: Compliance, Iron Tablets, Adolescents, Anemia, Stunting*

INTRODUCTION

Adolescents experience the triple burden of diabetes, namely obesity, nutritional deficiencies, and micronutrient deficiencies (anemia). Cases of anemia are more common worldwide, namely iron deficiency anemia. (Habtegiorgis et al., 2022). Based on data from the World Health Organization in 2019 globally, the prevalence of women of reproductive age (15-49 years) who experience anemia is 29.9% (WHO, 2022b).

Anemia in adolescence affects the quality of life and its offspring. The long-term impact of young women who experience anemia is the increased risk of giving birth to babies with low birth weight (LBW), bleeding during pregnancy, and the risk of experiencing abortion and congenital disabilities (Priyanto, 2018)

The World Health Organization recommends a strategy, namely weekly iron supplementation. (WHO, 2018). Weekly iron supplementation can reduce anemia and increase iron requirements in adolescent girls who experience menstruation (Fernández-Gaxiola & De-Regil, 2020).

Iron supplementation is a specific intervention effort to prevent stunted babies' birth. Specific interventions are direct activities to address stunting (Bappenas, 2018). One of the specific intervention efforts is iron supplementation in female adolescents and women of childbearing age. Iron supplementation is effective in reducing the risk of adolescents experiencing anemia (Gosdin et al., 2021).

 Received 18-11-2022, Accepted 13-12-2022, Published online 15-12-2022.

Compliance with consuming iron supplementation affects the incidence of iron deficiency anemia in adolescents. (Handayani et al., 2022). The low adherence of adolescents to consuming iron tablets has an impact on increasing cases of iron deficiency anemia in young women. (Anjarwati & Ruqoiyah, 2020). This systematic review study aims to determine the factors influencing female adolescent compliance in consuming iron tablets as a specific intervention effort to prevent stunting.

METHOD

This research method is a systematic review. The electronic databases used in this research are Scopus, ScienceDirect, World of Science (WoS), SAGE, and Google Scholar. Literature search uses a combination of Boolean Operators (AND and OR). The keywords used in the systematic review: namely "adolescent" AND "adherence" OR "compliance" AND "Iron Folic Acid" AND "anaemia" OR "Anemia." The population in this study is young women; Intervention: iron supplementation; Outcome: Compliance with iron supplementation in female adolescents.

The inclusion criteria are as follows: (i) search for research articles is limited to a period of 5 years (2018-2022), (ii) original articles and open access, (iii) full-text research articles using English and Indonesian (iv) titles and abstracts in the article containing the determinants of adherence to iron supplementation in female adolescents.

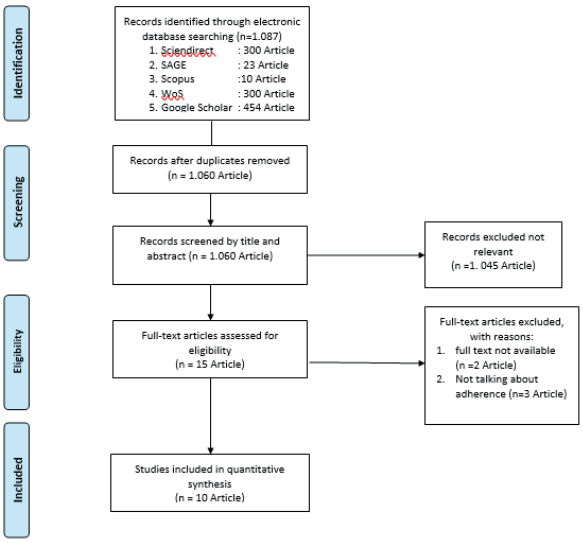

Figure 1. PRISMA 2009 Flow Diagram

The exclusion criteria in this article were (i) the research article was a review article and (ii) and the research article contained iron adherence in pregnant women.

The article selection process using PRISMA 2009 is as follows:

RESULT AND DISCUSSION

Anemia is when the body has a hemoglobin level in the blood below the normal limit (12 g/dl). The increased risk of developing anemia is due to the increased need for iron during the rapid growth of pregnancy, children, and adolescents (WHO, 2022a).

The prevalence of anemia cases globally can be categorized into three. Namely, 954.3 million have mild anemia, 747.8 million have moderate anemia, and 59.5 million have severe anemia (Safiri et al., 2021). The prevalence of anemia is higher in female adolescents compared to male adolescents. Adolescent girls experience iron loss during menstruation every month and insufficient nutritional intake. (Akbarpour et al., 2022).

Iron supplementation in adolescence is a form of pre-conception preparation before becoming a mother-to-be. One of the efforts to prevent anemia during pregnancy (Annisa & Nurmala, 2018). Research states that the provision of iron supplementation in adolescents affects the increase in hemoglobin in the blood (Fernández-Gaxiola et.al, 2020)

Based on the results of the 2018 Riskesdas shows that the coverage of iron tablets in Indonesia is relatively low. 76.2% of young women in Indonesia received iron tablets, of whom 1.4% consumed ≥52 iron tablets, while 98.6% of young women only consumed <52 tablets (Kementerian Kesehatan RI, 2019).

The low adherence to the consumption of iron tablets is related to the incidence of anemia cases in adolescent girls. (Savitri et al., 2021). Several factors affect adherence to iron tablets in adolescents, namely sociodemographic, cues to action , intrapersonal, interpersonal, and institutional factors.

Intrapersonal factors, namely motivational factors to consume iron tablets, affect female adolescent adherence. In one study, it was

shown that there was a decrease in motivation to consume iron tablets when young women felt an unpleasant odor from the tablet (Ansari et al., 2021). Some young women said that the iron tablets smelled fishy and unpleasant (Larasati et al., 2021). Adolescent Girls also experience side effects from iron tablets, namely feeling nauseous, dizzy, and constipated. Many young women tend to be disobedient in taking iron tablets regularly (Putra et al., 2020). The age factor is related to the adherence of female adolescents to taking iron tablets. Adolescent girls aged 15-18 have low compliance with weekly iron supplementation (Okunade, 2021)

The cues to action come from exposure to information from technologies that explain the prevention of anemia. The use of technology can increase the adherence of young women to consuming iron tablets. The technology is an application that provides health education about anemia and reminds young women to take iron supplements every week. This study showed that the use of technology could increase female adolescent compliance in consuming iron tablets. (Rohani et al., 2022). The use of technology in TB patients helps improve patient compliance during tuberculosis treatment. This technology will notify patients to take anti-tuberculosis drugs (OAT) (Atamou et al., 2022).

The lack of information that young women get about iron tablets has an impact on low knowledge about the benefits of iron tablets as an effort to prevent anemia (Annisa & Nurmala, 2018). Adolescent Girls who do not feel the benefits of taking iron tablets impact them, so they think taking them is unnecessary (Alfiah et al., 2020). Research shows that the factor causing the non-adherence of young women not taking iron tablets is the lack of perceived benefits (Sudfeld et al., 2020).

Sociodemographic factors that influence adherence include higher education levels in mothers, which affect adolescent girls' adherence to consuming iron tablets compared to mothers with low education. Mothers with higher education have extensive knowledge and insight and are very easy to access and follow the development of information related to efforts to prevent anemia (Agustina, 2019).

Mother's occupation is related to the adherence of female adolescents to taking iron tablets (Dubik et al., 2019). Research shows that the mother's occupation and education are related to immunization adherence (Yuda & Nurmala, 2018).

Interpersonal factors affect adherence to the consumption of iron tablets, namely social support associated with adherence to consuming iron tablets. This social support can come from family, friends, and school. Family support is associated with female adolescent adherence to consuming iron tablets. The high support encourages young women to have a strong intention to consume iron tablets to prevent anemia. (Samputri & Herdiani, 2022). One form of parental support in adherence to iron consumption is reminding the regular schedule for consuming iron tablets and parents providing iron tablets at home. The higher family support for consuming iron tablets impacts the lower risk of female adolescents experiencing anemia (Estiyani, 2020). The role of parents in preventing anemia in adolescents is needed. These parents' role influences young women's adherence to iron tablets. The factors of supervision and encouragement from parents influence adherence to iron tablets in female adolescents (Apriningsih et al., 2019). Parents who supervise their children taking iron tablets have higher adherence than those not supervised by their parents. Other research shows that the role of the family is very important in providing a stimulus to drug abuse (Annisa & Nurmala, 2018).

Friend support influences adolescents to consume iron tablets. (Sudfeld et al., 2020) Adolescents surrounded by friends who are very motivated to consume iron tablets have an impact on increasing female adolescent adherence. Adolescent girls with good peer support, the higher the adherence to consuming iron tablets (Sri Raharjo & Indrayanti, 2021).

Institutional factors related to adherence to the consumption of iron tablets are school support. Compliance with the consumption of iron-added tablets is influenced by school support in distributing and organizing young women to consume it every day a week (Apriningsih et al., 2020). The implementation of the distribution of

iron tablets has an impact on reducing anemia in young girls. However, there are still several schools that still need to implement the distribution properly. The existence of support from schools increases male adolescent compliance in consuming iron tablets.

Tabel 1. Reference Articles Related to the Determinants of Compliance of Young Women in Consuming Iron Tablets

Peneliti	Judul	Desain Studi	Hasil
Rai, (2022)	Iron-and-folic-acid supplementation among adolescents (aged 10–19 years) in two North Indian States, 2015–2016: a sex-stratified analysis	Cross-Sectional Survey	Factor influencing adherence to iron tablets in female adolescents is the mother's education.
Rohani et al., (2022)	Smartphone Application "Teenfit" in Increasing Compliance with Taking Iron Supplements in Adolescents in Bantul Indonesia	Quasi Eksperiment	Intervention using the TEEN FIT application can increase adherence to consuming iron supplement tablets in young women at school
Ansari et al., (2021)	The acceptability of weekly iron-folic acid supplementation and its influencing factors among adolescent school girls in Yogyakarta city: a mixmethods study	Mix Mtehods study	Factors that influence the consumption of iron tablets in adolescents are motivation, side effects, and not having the support of friends.
Okunade, (2021)	Prevalence of Anaemia and Compliance to Weekly Iron-Folic Acid Supplementation Programme amongst Adolescents in Selected Schools of Urban Puducherry, India	Cross-Sectional Survey	The age factor is related to the adherence of female adolescents to taking iron tablets.
Gosdin et al., (2020)	Barriers to and Facilitators of Iron and Folic Acid Supplementation within a School-Based Integrated Nutrition and Health Promotion Program among Ghanaian Adolescent Girls	Cross-Sectional Survey	One factor that supports female adolescent adherence to consuming iron tablets is school support.
Alfiah et al., (2020)	Converage and adherence of weekly iron folic acid supplementation among school going adolescent girls in Indonesia	Cross-Sectional Survey	Disobedience of young women consuming iron tablets, namely young women, feel that consumption of iron tablets does not need to be consumed regularly.
Apriningsih et al., (2020)	Determinant of Highschool Girl Adolescent Adherence to Cosume Iron Folic Acid Supplementation in Kota Depok	Cross-Sectional Survey	Factors related to adherence to taking iron tablets are school organization, student motivation, and teacher support.
Sudfeld et al., (2020)	Population-level efeetive coverge if adolescent weekly iron and folic acid supplemnetataion is low in rural west Bengal, India	Cross-Sectional Survey	Factors causing the non-adherence of young women not taking iron tablets are the lack of perceived benefits and the support of friends.
Dubik et al., (2019)	Compliance with Weekly Iron and Folic Acid Supplementation It's Associated Factors among Adolescent Girls in Tamale Metropolis of Ghana	Cross-Sectional Survey	Factors related to adherence to consumption of iron tablets among young women were mother's education, mother's occupation, awareness of anemia and knowledge
Apriningsih et al., (2019)	The Role of Parents in Increasing Student Adherence to Taking Iron Folate Tablets in Depok City	Cross-Sectional Survey	The role of parents is related to the adherence of young women to consuming iron tablets.

Teachers at school play an important role in providing health education regarding the intervention of consuming iron tablets every week. It is intended that young women understand the purpose of the iron supplementation program, namely to prevent iron deficiency anemia in their teens (Nuradhiani et al., 2017)

CONCLUSION

Adherence of young women in consuming iron tablets is influenced by sociodemographic factors such as the mother's occupation, education, and teenage age. Intrapersonal factors such as young women's motivation and perceived benefits. Interpersonal factors such as support from parents, peers, and teachers. Institutional factors such as school support in the distribution of iron tablets

There is a need for health education for young women and parents as well as strengthening commitment to schools so that support in the implementation of iron supplementation gets specific intervention efforts to prevent stunting.

ACKNOWLEDGEMENT

We gratefully acknowledge the funding from Maching Fund Kedaireka "Desa Emas" Accelerating the Reduction of Stunting in East Java.

DAFTAR PUSTAKA

Agustina. (2019). Analisis pengetahuan terhadap kepatuhan remaja putri dalam mengkonsumsi tablet tambah darah untuk pencegahan dan penanggulangan anemia gizi besi. *Jurnal Ilmiah Kesehatan Masyarakat*, *11*(4), 269–276.

Akbarpour, E., Paridar, Y., Mohammadi, Z., Mard, A., Danehchin, L., Abolnezhadian, F., Azadpour, S., Rahimi, Z., Zamani, M., Cheraghian, B., Poustchi, H., & Shayesteh, A. A. (2022). Anemia prevalence, severity, types, and correlates among adult women and men in a multiethnic Iranian population: the Khuzestan Comprehensive Health Study (KCHS). *BMC Public Health*, *22*(1), 1–13. https://doi.org/10.1186/s12889-022-12512-6

Alfiah, E., Briawan, D., Khomsan, A., Dewi, M., Ekayanti, I., Mardewi, Raut, M. K., Zakaria, A., & Roche, M. L. (2020). Coverage and adherence of weekly iron folic acid supplementation among school going adolescent girls in indonesia. *Journal of Nutritional Science and Vitaminology*, *66*, S118–S121. https://doi.org/10.3177/jnsv.66.S118

Anjarwati, A., & Ruqoiyah, S. (2020). Obedience of iron tablet consumption reduces risk of anemia among Indonesian female adolescents. *Journal of Health Technology Assessment in Midwifery*, *3*(1), 24–28. https://doi.org/10.31101/jhtam.1345

Annisa, F. N., & Nurmala, I. (2018). Influence Perceived Benefit and Perceived Self Efficacy with Intention of Adolescent girls in Consuming Fe Tablet. *Indian Journal of Public Health Research & Development*, *8*(4). https://doi.org/10.5958/0976-5506.2018.00307.8

Ansari, M. R., Istiti Kandarina, B. J., Kusmayanti, N., Destriyani, D., Masfufah, M., & Fikrinnisa, R. (2021). The acceptability of weekly iron-folic acid supplementation and its influencing factors among adolescent school girls in Yogyakarta city: a mixmethods study. *Malaysian Journal of Nutrition*, *27*(1), 53–66. https://doi.org/10.31246/MJN-2020-0019

Apriningsih, A., Madanijah, S., Dwiriani, C. M., & Kolopaking, R. (2019). Peranan Orang-Tua Dalam Meningkatkan Kepatuhan Siswi Minum Tablet Zat Besi Folat Di Kota-Depok. *GIZI INDONESIA*, *42*(2), 71. https://doi.org/10.36457/gizindo.v42i2.459

Apriningsih, Madanijah, S., Dwiriani, C. M., & Kolopaking, R. (2020). Determinant of highschool girl adolescent'adherence to consume iron folic acid supplementation in Kota Depok. *Journal of Nutritional Science and Vitaminology*, *66*, S369–S375. https://doi.org/10.3177/jnsv.66.S369

Atamou, L., Setiawan, A., & Rahmadiyah, D. C. (2022). Penggunaan Teknologi Layanan Short Message Service Terhadap Kepatuhan Pengobatan pada Pasien Tuberkulosis: Literature Review. *Jurnal Keperawatan*, *14*(1), 253–264.

Dubik, S. D., Amegah, K. E., Alhassan, A., Mornah, L. N., & Fiagbe, L. (2019). Compliance with Weekly Iron and Folic Acid Supplementation and Its Associated Factors among Adolescent Girls in Tamale Metropolis of Ghana. *Journal of Nutrition and Metabolism*, *2019*. https://doi.org/10.1155/2019/8242896

Estiyani, A. (2020). Hubungan Dukungan Keluarga Terhadap Konsumsi Tablet Tambah Darah (Ttd) Dengan Kejadian Anemia Pada Remaja Putri.

Jurnal Kebidanan Mutiara Mahakam, *8*(1), 71–76. https://doi.org/10.36998/jkmm.v8i1.83

Fernández-Gaxiola, A. C., & De-Regil, L. M. (2020). Intermittent iron supplementation for reducing anaemia and its associated impairments in adolescent and adult menstruating women. *International Journal of Evidence-Based Healthcare*, *18*(2), 274–275. https://doi.org/10.1097/XEB.0000000000000212

Gosdin, L., Sharma, A. J., Tripp, K., Amoaful, E. F., Mahama, A. B., Selenje, L., Jefferds, M. E., Martorell, R., Ramakrishnan, U., & Addo, O. Y. (2021). A School-Based Weekly Iron and Folic Acid Supplementation Program Effectively Reduces Anemia in a Prospective Cohort of Ghanaian Adolescent Girls. *Journal of Nutrition*, *151*(6), 1646–1655. https://doi.org/10.1093/jn/nxab024

Gosdin, L., Sharma, A. J., Tripp, K., Amoaful, E. F., Mahama, A. B., Selenje, L., Jefferds, M. E., Ramakrishnan, U., Martorell, R., & Addo, O. Y. (2020). Barriers to and facilitators of iron and folic acid supplementation within a school-based integrated nutrition and health promotion program among ghanaian adolescent girls. *Current Developments in Nutrition*, *4*(9), 1–11. https://doi.org/10.1093/cdn/nzaa135

Habtegiorgis, S. D., Petrucka, P., Telayneh, A. T., Getahun, D. S., Getacher, L., Alemu, S., & Birhanu, M. Y. (2022). Prevalence and associated factors of anemia among adolescent girls in Ethiopia: A systematic review and meta-analysis. *Plos One*, *17*(3), e0264063. https://doi.org/10.1371/journal.pone.0264063

Handayani, Y., Budiman, I. A., Studi, P., Keperawatan, P., Ilmu, F., Universitas, K., & Yunihudsacid, E. (2022). Hubungan Kepatuhan Konsumsi Tablet Fe Terhadap Kejadian Anemia Correlation Fe Tablet Consumption Compliance with Anemia yang banyak dan tidak diiringi dengan (Dinas Kesehatan Kabupaten Jember suatu anemia yang penyebabnya yakni haemoglobin yang ada pada. *Oksitosin: Jurnal Ilmiah Kebidanan*, *9*(2), 121–130.

Kementerian Kesehatan RI. (2019). *Laporan Nasional Riskesdas 2018*. Kementrian Kesehatan Republik Indonesia. https://doi.org/10.12688/f1000research.46544.1

Kementerian PPN/ Bappenas. (2018). Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi di Kabupaten/Kota. *Rencana Aksi Nasional Dalam Rangka Penurunan Stunting: Rembuk Stunting*, *November*, 1–51. https://www.bappenas.go.id

Larasati, D. K., Mahmudiono, T., & Atmaka, D. R. (2021). Literature Review : Hubungan Pengetahuan dan Kepatuhan Mengkonsumsi Tablet Tambah Darah dengan Kejadian Anemia Defisiensi Besi Literature Review : Correlation Of Knowledge and Compliance of Iron Folic Acid Supplement Consumption with Iron Deficiency Anemi. *Media Gizi Kesmas*, *10*(02), 120.

Nuradhiani, A., Briawan, D., & Dwiriani, C. M. (2017). Dukungan guru meningkatkan kepatuhan konsumsi tablet tambah darah pada remaja putri di Kota Bogor. *Jurnal Gizi Dan Pangan*, *12*(3), 153–160. https://doi.org/10.25182/jgp.2017.12.3.153-160

Okunade, K. (2021). Prevalence of Anaemia and Compliance to Weekly Iron-Folic Acid Supplementation Programme amongst Adolescents in Selected Schools of Urban Puducherry, India. *Nigerian Postgraduate Medical Journal*. https://doi.org/10.4103/npmj.npmj

Priyanto, L. D. (2018). The Relationship of Age, Educational Background, and Physical Activity on Female Students with Anemia. *Jurnal Berkala Epidemiologi*, *6*(2), 139. https://doi.org/10.20473/jbe.v6i22018.139-146

Putra, K. A., Munir, Z., & Siam, W. N. (2020). Hubungan Kepatuhan Minum Tablet Fe dengan Kejadian Anemia (Hb) pada Remaja Putri Di SMP Negeri 1 Tapen Kabupaten Bondowoso. *Jurnal Keperawatan Profesional*, *8*(1), 49–61. https://doi.org/10.33650/jkp.v8i1.1021

Rai, R. K. (2022). Iron-and-folic-acid supplementation among adolescents (aged 10-19 years) in two North Indian States, 2015-2016: a sex-stratified analysis. *Public Health Nutrition*, *25*(3), 617–622. https://doi.org/10.1017/S136898002000508X

Rohani, T., Diniarti, F., & Febriawati, H. (2022). *Aplikasi Smartphone "Teenfit" Dalam Meningkatkan Kepatuhan Minum Suplemen Zat Besi Pada Remaja Di Bantul Indonesia*. *9*(3), 156–167.

Safiri, S., Kolahi, A. A., Noori, M., Nejadghaderi, S. A., Karamzad, N., Bragazzi, N. L., Sullman, M. J. M., Abdollahi, M., Collins, G. S., Kaufman, J. S., & Grieger, J. A. (2021). Burden of anemia and its underlying causes in 204 countries and territories, 1990–2019: results from the Global

Burden of Disease Study 2019. *Journal of Hematology and Oncology*, *14*(1), 1–16. https://doi.org/10.1186/s13045-021-01202-2

Samputri, F. R., & Herdiani, N. (2022). Pengetahuan dan Dukungan Keluarga dengan Kepatuhan Konsumsi Tablet Tambah Darah pada Remaja Putri. *Jurnal Media Kesehatan Masyarakat Indonesia*, *21*(1), 69–73.

Savitri, M. K., Tupitu, N. D., Iswah, S. A., & Safitri, A. (2021). Hubungan Kepatuhan Konsumsi Tablet Tambah Darah Dengan Kejadian Anemia Pada Remaja Putri: a Systematic Review. *Jurnal Kesehatan Tambusai*, *2*(2), 43–49. http://journal.universitaspahlawan.ac.id/index.php/jkt/article/view/1784

Sri Raharjo, D., & Indrayanti. (2021). Dukungan Peer Group Terhadap Kepatuhan Konsumsi Minum Obat Tablet Tambah Darah Pada Remaja Putri Di Sma N 1 Banguntapan Tahun 2020. *Journal of Health (JoH)*, *8*(1), 36–41. https://doi.org/10.30590/joh.v8i1.226

Sudfeld, C. R., Rai, R. K., Barik, A., Valadez, J. J., & Fawzi, W. W. (2020). Population-level effective coverage of adolescent weekly iron and folic acid supplementation is low in rural West Bengal, India. *Public Health Nutrition*, *23*(15), 2819–2823. https://doi.org/10.1017/S1368980020000932

WHO. (2018). Weekly iron and folic acid supplementation as an anaemia-prevention strategy in women and adolescent girls Lessons learnt from implementation of programmes among non-pregnant women of reproductive age. *World Health Organization*, 40. https://www.who.int/nutrition/publications/micronutrients/WIFS-anaemia-prevention-women-adolescent-girls/en/

WHO. (2022a). *Global anaemia reproductive age: among women of reduction efforts of targets and the impact, achievement way forward for optimizing efforts*. https://apps.who.int/iris/handle/10665/336559

WHO. (2022b). *WHO Global Anaemia estimates, 2021 Edition*. https://www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children#:~:text=Summary findings&text=In 2019%2C global anaemia prevalence,women aged 15-49 years.

Yuda, A. D., & Nurmala, I. (2018). The Relationship of Characteristics, Knowledge, Attitudes, and Mother's Action on Immunization Compliance. *Jurnal Berkala Epidemiologi*, *6*(1), 86. https://doi.org/10.20473/jbe.v6i12018.86-94