Knowledge and Awareness Impact on Adherence to Iron Supplementation: Study in Baron sub-district, Nganjuk Regency

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ABSTRACT

Background: The initial report by the Baron Public Health Centre shows low adherence to iron supplementation among schoolgirls. Therefore, there is a need to identify the causing factors of low adherence.

Purpose: Identify and analyse knowledge and awareness of iron deficiency and its impacts on adherence to iron supplements.

Methods: A Cross-sectional study on 376 female students in the Baron subdistrict. Data were collected using a questionnaire instrument, and data were analysed using binary regression logistics.

Results: A Cross-sectional study with stratified random sampling on 376 female students in the Baron subdistrict. Data were collected using a questionnaire instrument, and data were analysed using binary regression logistics. The majority of respondents have sufficient knowledge of iron deficiency. However, they have low awareness and adherence to iron supplementation. Knowledge has no impact on adherence (p-value 0.823), whereas awareness (p-value 0.000) has a significant impact on adherence to iron supplementation.

Conclusion: Knowledge has no impact on iron deficiency adherence, while awareness of iron deficiency prevention influences has a strong impact on adherence to iron supplementation adherence. Innovative programs are needed to increase not only knowledge but also awareness and adherence to iron supplements.

Keywords: adherence, adolescent girls, iron supplementation

BACKGROUND

Iron deficiency is a micronutrient deficiency that has long-term negative impacts. Iron deficiency in infants usually does not show symptoms in a few months but is closely related to motor disorders if it occurs for a longer period(Santos et al., 2018). Iron deficiency has also been shown to cause cognitive disorders(Miller, 2013). Iron deficiency in pregnant women increases the risk of premature birth, low birth weight and stunting(Haider et al., 2013; Halim et al., 2021).

Iron deficiency in adolescent girls needs special attention. Adolescence experiences significant physical and mental development. In addition, teenage girls are ten times more susceptible to iron deficiency compared to teenage boys because of the menstrual process (Kulsum, 2020). Adolescent girls are also prospective mothers in the future, so tackling iron deficiency now will save Indonesia's future generations.

The prevalence of iron deficiency in adolescent girls in Indonesia is very high. Data from the Indonesian Health Basic Research in 2018 shows that the prevalence of iron deficiency in Indonesia among adolescent girls was 32% (Kesehatan, 2019). Data from the East Java Health Service in 2020 indicated that the percentage of iron deficiency in adolescent girls is 40% (Iftitah et al., 2022). The screening by the Baron Community Health Center showed that 60.89% of adolescent girls experience iron deficiency. The high prevalence of iron deficiency has become a special concern for the ministry and health services through various education and iron supplementation programs.

Iron supplementation is a program implemented by the government to prevent and control iron deficiency. Iron supplementation is given to all students regardless of their iron deficiency status. A preliminary study conducted by Baron Community Health Centre revealed that there are significant adolescent girls who did not regularly take iron supplements. Many students also do not understand how to take it or even let family take the supplements. Low adherence certainly results in a lack of success in programs to improve the health status of adolescent girls. Based on the problems described, further research is needed to identify factors that influence adherence to iron supplementation.

Various health behaviour theories argue that individual knowledge, perceptions, and beliefs will shape behaviour (Glanz et al., 2015). So, the research will focus on testing whether knowledge and awareness factors have an impact on adherence to iron supplementation among schoolgirls in Baron districts.

METHODS

The research is conducted with a cross-sectional method to identify and analyse the knowledge and awareness of iron deficiency and its impacts on iron supplementation adherence. The population in this study all schoolgirls in junior and senior high school who took part in iron supplementation program. The sampling technique used is Stratified Random Sampling. A total of 4 schools were randomly selected using Ms. Excel. Then, after the school was selected, randomisation was conducted to choose which class of female students would be a respondent. The total number of respondents in this study was 376 respondents.

School	Sampling
MTsN 4 Nganjuk	131
MA Al Hidayah	59
Baron 1 Middle School	108
Al Khoiriyah Vocational School	78
Total Respondents	**376**

Table 1. Research Locations and Number of Respondents

The independent variables in this research were knowledge and awareness of iron deficiency, while the dependent variable was adherence to iron supplementation. Data were analyzed using binary *logistic regression*, considering research pupose and data scale. Binary logistic regression is method of statistical analysis to describe the effects between a dependent variable that has two categories or with one or more independent variables on a categorical or continuous scale (Suwarjana, 2016).

RESULTS

The distribution of respondents based on knowledge about iron deficiency is presented in the following table. Knowledge is categorised into 3, namely good (>=75% correct answer), sufficient (50%-74% correct answer) and poor category (<50%) correct answer field (Arikunto, 2019). This category is based on expert opinion. The distribution of respondents' knowledge, awareness and adherence status is presented in the following table.

Characteristics	Frequency	Percentage
Knowledge		
Poor	15	4.0%
Sufficient	263	69.9%
Good	98	26.1%
Awareness		
Poor	180	47.9%
Sufficient	145	38.6%
Good	51	13.6%
Adherence		
No	267	71.0%
Yes	376	29.0%

Table 2. Respondent knowledge, awareness and iron supplementation adherence

Based on the data in the table, it is known that the majority of female students have sufficient iron deficiency, namely 69.9%. In general, they already know the definition of iron deficiency and what actions can be taken to prevent and control iron supplementation. Slightly more than a quarter of respondents have good knowledge, whereas a less significant percentage of schoolgirls have poor knowledge of iron deficiency.

Awareness was also classified into three categories, namely good (>=75% positive answers), sufficient (50%-74% positive answers) and poor category (<50% positive answers). Based on the data in the table, it is shown that almost half of schoolgirls have low awareness of iron deficiency. As many as 38.6% have sufficient awareness of iron deficiency, and there a low percentage of respondents who have a high awareness of iron deficiency.

Characteristics	Frequency	Percentage
Remember when to take iron supplements	170	45.2%
Don't let other people take their iron supplement	130	34.6%
Reduce consumption of tea and coffee	283	75.3%
Feeling guilty when eat less nutritious food	214	56.9%
Be mindful before eating	162	43.6%
Tell parents about the iron supplementation program.	254	67.6%

Table 3. Details on Schoolgirls' Awareness of Iron Deficiency

The data from the questionnaire also gives more details on respondents' low awareness of iron deficiency. More than half of schoolgirls do not remember schedule to take iron supplementation. A significant number of respondents let the other family members take their iron supplements. Approximately half of schoolgirls do not pay attention to their diet and do not feel guilty when consuming less nutritious food. Fortunately, most respondents reduce coffee and tea consumption and tell their parents about iron supplementation programs.

The *Binary Logistic Regression* test showed that 45.0% of adherence to iron supplementation was due to the variables in this research while 55,0% were influenced by other factors which is not in the research. Knowledge of iron deficiency has no impact on adherence (p-value 0.812), while awareness has a significant impact on iron supplementation adherence (p-value 0.000). The Exp value is 10,347, which indicates that a higher level of awareness of iron deficiency will increase 10 times more probability for schoolgirls to be more adherent to iron supplementation.

DISCUSSION

Individual behaviour is an important determinant in improving public health. Developing personal skills is also the main action of health promotion (Mcqueen & De Salazar, 2011). In the case of iron deficiency in adolescent girls, routine consumption of iron supplements will improve hemoglobin and treat iron deficiency. Removing iron deficiency cases in Indonesia not only improves health for current but also future generations. Iron deficiency in mothers has a strong correlation to stunting in children (Halim et al., 2021). The current adolescents will give birth to children in future, and Indonesia should improve their nutrition starting from now.

Based on the research results, it is known that most respondents (69.9%) already have sufficient knowledge about the definition of iron deficiency, its impact on health and prevention. Unfortunately, the knowledge has not transformed into awareness yet, so the majority of respondents have low awareness of iron deficiency (47.9%). Many respondents admitted that they did not remember when to take iron supplements and ate whatever they wanted without considering the nutritional value of the food. Furthermore, as many as 71.0% of respondents stated that they did not regularly consume iron tablets provided by the community health centre.

Based on the research results, it is known that knowledge has no influence on iron supplementation adherence. Knowledge is the first door to changing behaviour. Knowledge will shape perceptions about the dangers and prevention of a disease, which will lead to actions or actions for prevention. However, there is a long process before knowledge transforms into action and knowledge itself will not be enough to shape actions. Other studies also show a similar result with this study that sometimes knowledge does not impact health behaviour (Ahmad, 2020; Amalia et al., 2021; Nurbeti et al., 2021). Knowledge cannot stand alone in changing behaviour and needs to be supported by factors such as environmental support self-efficacy.

Awareness has a significant impact on adherence to iron supplementation. Someone who is aware shows that he cares and is ready to act to prevent the disease. The importance of awareness for healthy living has been understood, so many programs have been implemented to increase awareness of healthy behaviour (Darmawan et al., 2010; Sugiarto & Gabriella, 2020). Based on the research results, it is known that there is a gap between knowledge and awareness of iron deficiency. It means that current health education on schoolgirls is effective in increasing knowledge, but not their awareness and compliance to iron supplementation. So, the program to improve adherence to iron deficiency should not only increase knowledge but

also awareness and create a supportive environment.

CONCLUSION

Knowledge has no impact on adherence to iron supplementation, while awareness of iron deficiency prevention substantially impacts compliance with iron supplementation. Innovative programs are needed to increase knowledge and awareness to improve adherence to iron supplementation among schoolgirls.

CONFLICTS OF INTEREST

There is no conflict of interest in this research.

REFERENCES

Ahmad, M. H. (2020). Pengaruh Pengetahuan, Sikap dan Motivasi Terhadap Kepatuhan Dokter dalam Penulisan Diagnosis pada Resume Medis di RS Zahirah 2018. *Jurnal Administrasi Rumah Sakit Indonesia*, *4*(3).

Amalia, N. R., Basuki, D. R., Kusumawinakhyu, T., & Purbowati, M. R. (2021). Pengaruh pengetahuan dan sikap terhadap perilaku pasien TB Paru di Balai Kesehatan Paru Masyarakat (BKPM) Purwokerto. *Herb-Medicine Journal: Terbitan Berkala Ilmiah Herbal, Kedokteran dan Kesehatan*, *4*(1), 28-35.

Arikunto, S. (2019). Prosedur penelitian suatu pendekatan praktik.

Darmawan, B., Saam, Z., & Zulkarnaini, Z. (2010). Hubungan Pengetahuan, Sikap, Perilaku dan Peranserta dengan Kesadaran Lingkungan Hidup serta Kesanggupan Membayar Masyarakat Sekitar Bantaran Sungai di Kota Pekanbaru. *Jurnal Ilmu Lingkungan*, *4*(2), 103-116.

Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health behavior: Theory, research, and practice*. John Wiley & Sons.

Haider, B. A., Olofin, I., Wang, M., Spiegelman, D., Ezzati, M., & Fawzi, W. W. (2013). Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis. *Bmj*, *346*.

Halim, F., Ermiati, E., & Sari, E. A. (2021). Factors of stunting in toddlers: A literature review. *Journal of nursing care*, *4*(1).

Iftitah, O., Hanum, S. F., & ST, S. (2022). Incidence of Anemia Reviewed From Daily Diet in Adolescents in Waru Village. *Academia Open*, *6*, 10.21070/acopen. 21076.22022. 21692-21010.21070/acopen. 21076.22022. 21692.

Kesehatan, K. (2019). Laporan Nasional Riskesdas 2018. http://repository.bkpk.kemkes.go.id/3514/1/Laporan%20Riskesdas%202018%20Nasi onal.pdf.

Kulsum, U. (2020). Pola menstruasi dengan terjadinya anemia pada remaja putri. *Jurnal Ilmu Keperawatan Dan Kebidanan*, *11*(2), 314-327.

Mcqueen, D. V., & De Salazar, L. (2011). Health promotion, the Ottawa Charter and 'developing personal skills': a compact history of 25 years. *Health promotion international*, *26*(suppl_2), ii194-ii201.

Miller, J. L. (2013). Iron deficiency anemia: a common and curable disease. *Cold Spring Harbor perspectives in medicine*, *3*(7), a011866.

Nurbeti, M., Prabowo, E. A., Faris, M., & Ismoyowati, R. (2021). Hubungan Antara Tingkat Pengetahuan Dengan Kepatuhan Staf Rumah Sakit Dalam Penggunaan Alat Pelindung Diri Secara Rasional Di Masa Pandemi Covid-19. *The Journal of Hospital Accreditation*, *3*(2), 96-100.

Santos, D. C., Angulo-Barroso, R. M., Li, M., Bian, Y., Sturza, J., Richards, B., & Lozoff, B. (2018). Timing, duration, and severity of iron deficiency in early development and motor outcomes at 9 months. *European journal of clinical nutrition*, *72*(3), 332-341.

Sugiarto, A., & Gabriella, D. A. (2020). Kesadaran dan perilaku ramah lingkungan mahasiswa di kampus. *Jurnal Ilmu Sosial Dan Humaniora*, *9*(2), 260-275.

Suwarjana, I. K. (2016). *Statistik kesehatan*. Penerbit Andi.