



## Female Student prevention of Anemia at Padjadjaran Vocational High School Jatinangor

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**Abstract:** Healthy generation is one of the keys to achieve “Indonesia Emas 2045” envisioned by The Ministry of National Development Planning of Indonesia. To realize the vision, Indonesia should ensure the health of its citizens. Adolescents should become the priority because their nutrition and health might determine the quality of their future which implies the future of Indonesia's human resources quality. Anemia is a serious problem faced by Indonesia which has a prevalence of more than 40%. This paper aims to illuminate the anemia prevention efforts of female students at Padjadjaran Vocational High School. The design used in this study is qualitative, using a case study approach. The subjects of the study are Puskesmas Jatinangor, the program coordinator, and female students. Data were collected through observation, interviews, and documentation. The data validity technique used in this study is source and technique triangulation, with data analysis using organize the data which involve transcribing interview from the informants, peruse the data by finding general ideas from the informants, code the data using Atlas.ti software to write words representing category, generate a description of the setting or people as well as categories or themes for analysis, determine the ideas and description will be conveyed in the qualitative narrative, interpreting the data and explain the female student prevention at Padjadjaran Vocational High School Jatinangor. The results showed that Padjadjaran Vocational High School, collaborating with Puskesmas, holds an anemia prevention program in that includes anemia prevention dissemination to students in Padjadjaran Vocational High School conducted every three months, monthly blood check up to ensure students are not potentially suffered from anemia and prevent students from further disease, and providing blood supplement tablets to female students every week.

**Keywords:** adolescents, anemia prevention, puskesmas, padjadjaran vocational high school

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## INTRODUCTION

In 2030-2040, Indonesia is predicted to have a demographic bonus (Nuryani & Julia, 2022). Demographic bonus is a phenomenon of civilization of population in a country where there is an explosion of the number of people of productive age (15-64) that can be the basic capital in development (Sutikno, 2020). It has potential for economic growth, which is marked by a high number of productive age populations. In Indonesia, there are 68,3% of the



productive age population of the total Indonesian populations (Rokom, 2023). This high number could be either an advantage or a challenge for Indonesia.

In June 2023, Indonesia President Joko Widodo announced “Indonesia Emas 2045” through *Rencana Pembangunan Jangka Panjang Nasional (RPJPN) 2025-2045*. “Indonesia Emas 2045” is Indonesia's vision to become a sovereign, advanced, and sustainable country by 2045. In that year, Indonesia will be 100 years old and is targeted to become a developed, modern country and on par with the superpower countries. One of the key developments is good health for all (Sekretariat RPJPN 2025-2045, n.d.). However, Indonesia still faces health condition challenges of its populations, especially for Adolescents.

Adolescence is a period of transition or movement from childhood to adulthood, this can be marked by the occurrence of several physical and mental changes. The functioning of reproductive organs, such as menstruation, is one sign of physical changes that usually occur at the age of 10–19 years. To produce the nation's next generation who are creative, competitive, and productive, the health and nutritional status of adolescents must be prepared as early as possible because ensuring the health of adolescents is an investment in the nation's future to continue the nation's leadership relay. However, Indonesia still faces health issues among adolescents due to the lack of nutrition, one of which is micronutrient nutrition deficiencies, namely anemia (Puspikawatmaui et al., 2021).

Research found that the prevalence of anemia in Indonesia is 48.9% which means it is a serious problem if it affects more than 40% of the total population (Margawati et al., 2023). According to Riset Kesehatan Dasar (Riskesdas) data from the Ministry of Health of the Republic of Indonesia's Research and Development Agency in 2018, the prevalence of anemia in female adolescents in the age of 19-24 was 32%. This data shows that three to four out of ten female adolescents in Indonesia suffer from anemia (Djogo et al., 2021; Junita et al., 2023). Anemia is a condition in which there is a reduced number of hemoglobin (Hb) concentration and/or red blood cell (RBC) numbers lower than normal and inadequate to comply with an individual's physiological needs (Chaparro & Suchdev, 2019). One of the causes of anemia is malnutrition, either due to iron deficiency or worms, especially in areas with poor sanitation and limited access to clean water. If left unchecked, anemia could affect an adolescent's health, for example issues related to the heart, lungs, pregnancy, growth and development, and difficulty carrying out daily activities. This can hinder their development to be productive, creative, and competitive in the future (Maudisha, 2022). Another study also shows that anemia is influenced by a variety of personal and familial variables. The univariate logistic analysis revealed that being obese, having parents with higher education levels, having other relatives as caregivers, having started menstruation, and having vegetable intake  $\geq 400$  g/d were protective factors against female adolescent anemia while having vegetable intake  $\geq 3$  times/d and having other relatives as caregivers were risk factors (Li et al., 2022). Thus, this should be prevented as early as possible.

The prevalence of anemia appears to be high, especially in developing countries, the combined prevalence of anemia in women of reproductive age in South Asia and Southeast Asia is 52%, min-max 22.7-62%. West Java is one of the provinces with a fairly high prevalence of anemia. West Java is 13.4%, even though it is located in urban areas, the prevalence is quite high (Fayasari et al., 2022). Padjadjaran Vocational High School (Padjadjaran Vocational High School) is a private school located in Jatinangor, West Java Province, Indonesia. It is one of at least five vocational high schools in Jatinangor, Sumedang Regency, Indonesia. Established in 2009, it has specific competencies in technology and business management. By December 2023, there are 129 female students in Padjadjaran Vocational High School.

At the vocational school level, the average student is 15 to 16 years old. At this relatively young age, adolescent's level of knowledge can also be influenced by some of the information they obtain. The less information they receive, the lower their level of knowledge will be.

Schools might be the right place where they can obtain such knowledge, especially in regard to diseases such as anemia.

In complementing previous research, this paper will explain in more depth the school's efforts to prevent anemia, specifically in the Padjadjaran Vocational School which has collaborated with other actors, specifically with the public health center (Puskesmas). Khairunnisa et al (2020) explains the utilization of the School Health Room (*unit kesehatan sekolah/UKS*) as an effort to prevent anemia in elementary school students. Musniati & Fitria (2022) illustrate anemia prevention through education in high school female adolescents by using methods such as planning, implementing, and evaluating. However, it doesn't include collaboration with other actors specifically with Puskesmas.

This paper aims to illuminate the anemia prevention efforts of female students at Padjadjaran Vocational High School by collaborating with Puskesmas and giving education through disseminations. This paper will also compare and examine other related studies and highlight the differences to see the novelty.

The novelty offered in this paper is how schools can contribute to prevent anemia among female adolescents by also collaborating with Puskesmas. Additionally, Padjadjaran Vocational High Schools in Jatinangor is the subject of this study, which serves as a case study and offers pertinent recommendations for raising the standard at institutions of similar programs. It also offers detailed insights into the process of the anemia prevention program.

## METHOD

This study used qualitative approach to explore and understand the meaning of individuals or groups ascribe to a social or human phenomenon. The instruments used in this study were interview protocol and observation. The qualitative design used in this study is case study, where this design is found in many fields, especially evaluation. In case study research, scholars analyze a case in detail, usually focusing directly on one or more people, programs, events, activities, or processes (Creswell, 2014; Yin, 2016). The essence of case study research is to illuminate a decision or set of decisions, why it occurs, how to implement it, and what is the result (Yin, 2009). The type of case study used in this research is an *intrinsic case study* where the researcher's interest is simply in understanding the case at hand. The aim is to generalize within rather than from the case (Cousin, 2005).

A case study typically involves the collection of data on the person(s), program(s), or event(s) that are the subject of the investigation. These data frequently consist of observations, interviews, written materials (such as newspaper articles), audiovisual materials (such as photographs, videotapes, and audiotapes), and historical records (such as test results) in a period.

The subjects of this study were the speaker from Puskesmas Jatinangor, the program coordinator, and female students. The program coordinator was the school staff responsible for coordinating the program. Female students were all female students in Padjadjaran Vocational High School who participated in the program. In qualitative research, primary data sources are used for data gathering, which is done in a natural setting. Participant observation, in-depth interviews, and documentation techniques are the main methods of data collection (Sugiyono, 2017). The primary method of gathering data for this study was conducting a thorough interview directly with the research participants. Furthermore, to achieve comprehensive outcomes, the data's completeness was further enhanced by the use of participant observation methods and activity documentation at the Padjadjaran Vocational High School.

Analyzing data involves several steps including: (1) organize the data which involve transcribing interview from the informants, (2) peruse the data by finding general ideas from the informants, (3) code the data using Atlas.ti software to write words representing category,

(4) generate a description of the setting or people as well as categories or themes for analysis, (5) determine the ideas and description will be conveyed in the qualitative narrative, (6) interpreting the data and explain the female student prevention at Padjadjaran Vocational High School Jatinangor (Creswell, 2014; Leedy et al., 2019). To validate the data, this research uses triangulation of data and techniques. Triangulation of data is carried out by examining the data from different sources: the speakers from Puskesmas Jatinangor, the program coordinator, and female students in Padjadjaran Vocational High School Jatinangor. Triangulation of techniques was used by examining the data through different data collections: observation, interview, and documentation (Creswell, 2014). The limitations of this study were: time limitation within a particular period of time, which was in September 2022 to August 2024; and the results are subjected to the researcher's interpretation.

## **RESULTS AND DISCUSSION**

School should provide not only education but also a healthy lifestyle they would cultivate as they grow older. School could be the role model for its students in sanitation to promote both education and health, such as giving them health facilities to clean water sanitation, education on disease prevention that are prone to their age, and health counseling. To make it happen, stakeholders outside the school could also contribute to promoting health among students. The government may provide funds or health facilities to schools. Parents may help the school build health facilities in school. Such collaboration is in line with the concept of Health Promoting School provided by World Health Organization (WHO) (Mwanri, 2001). This concept is also implemented by Padjadjaran Vocational High School in Jatinangor to prevent anemia among their students.

Every month, female adolescents will likely experience menstruation, including adolescents in Padjadjaran Vocational High School. This results in decreasing blood in their body, which affects them to anemia. Not only menstruation, anemia could be caused by nutritional deficiencies, a lack of vitamins A and B, and iron in daily consumptions. This is severed by the diet pattern to manage their weight (Deivita et al., 2021). To prevent anemia, Padjadjaran Vocational High School has been organizing a program since early September 2022. The program includes disseminating anemia prevention to students in Padjadjaran Vocational High School, monthly check-ups, and giving tablets to students which is consistently conducted weekly. The program becomes one of the routine activities carried out by the school

### **Anemia Dissemination by Puskesmas Jatinangor**

Every three months, Padjadjaran Vocational High School with Puskesmas Jatinangor holds an anemia prevention dissemination for adolescents in Padjadjaran Vocational High School. It is attended by all students, either male or female. The main speaker could be both from Puskesmas and the school (see [Figure 1](#)). It took approximately 90 minutes for the presentation before students were allowed to ask the speaker. The materials given at least include, the definition of anemia, possible causes of anemia, anemia symptoms, the impact of anemia, anemia prevention, balanced nutrition, and nutritional food. These materials are also based on the guidance book of anemia prevention published by the Ministry of Health of the Republic of Indonesia (Kementerian Kesehatan, 2018).



Figure 1. Anemia prevention dissemination to students at Padjadjaran Vocational High School

After the dissemination, students are allowed to ask the speaker with the topic at hand. The question-and-answer session increases student's curiosity regarding anemia. Several female students admitted that the program raised their awareness of the risk of anemia and how to prevent it by paying attention to what they eat and consuming routine blood supplement tablets. On the other hand, the school, in line with Puskesmas Jatinangor, also expects that the program will prevent students from diseases, particularly anemia, and create a healthy environment in the school. As the program is still conducted every three months, the materials given will vary but remain revolve around health and anemia.

### **Anemia Check-up**

In addition to anemia prevention dissemination, Padjadjaran Vocational High School and Puskesmas Jatinangor also hold a check-up every three months, right after the dissemination is conducted for students at school. Adolescents at their age may lose blood due to menstruations. This check-up program aims to check the blood level of the female students to keep them at normal level.

Anemia check-up includes a physical and hemoglobin examination. The physical examination could be an examination conjunctiva (anemic/not anemic), facial examination (pale/not pale), examination of lips, skin, nails and palms (pale/not pale). A hemoglobin test was conducted by the finger-prick method or taking venous blood using a syringe. Then the blood can be tested directly or collected into an examination tube, and then the blood is tested using special medical equipment for testing Hb. In the last anemia check-up, there were up to five female students whose blood level was below average, which was 11 to 12. This number doesn't imply severe anemia for those students. The normal Hb level for females is 12 to 16 grams per deciliter (g/dl) (Billett, 1990). Students who have severe inadequate blood levels will be referred to a special doctor for further treatment. However, most students have normal blood levels, and there are no students who have been referred to a special doctor.

### **Routine Blood Supplement Tablets**

Since the program has been started in early September 2022. Students are given blood supplement tablets by the program coordinator every week. Students come to school from Monday to Friday every week. On Every Friday, Meilani Alwianti, as the program coordinator and UKS constructor in Padjadjaran Vocational High School, provides blood supplement tablets to all female student before they enter the class in the morning. The blood tablets given to the students are distributed by the local local health center, which is Puskesmas Jatinangor. Students are suggested to consume the blood supplement tablets after they eat. Therefore, the school asks the students to bring their meal from home so that they can consume the blood supplement tablets at school without buying less healthy food. If their parents didn't bring them meals for lunch or breakfast to eat at school, they should consume the tablet at home. The school suggested not to buy less healthy food at the school canteen. To ensure that they consume the tablet at home, they should consume it with their parents, document it, and send it to their teacher as a proof. This allows teachers to monitor their students in accordance with

the program and evaluate the progress during check-up. The school also conveyed to the student's parents that the students will be referred to a special doctor if they found the students should have further treatment.

One of the effects after consuming blood supplement tablets experienced by the students was to relieve dizziness, although it didn't happen to all students. The school and Puskesmas Jatinangor hope that the program will also positively affect them in the long-term.

## **Discussion**

The anemia prevention program conducted by Padjadjaran Vocational High School and Puskesmas Jatinangor is one of the efforts to achieve "Indonesia Emas 2045" through education about anemia, anemia check-up, and blood supplement tablets to female students in school. Instead conducting a one-day program to prevent anemia, they take this program to be sustainable. This is also because the students are expected to be more aware and get more detailed information about anemia. To make it happen, a one-day education program for students will not be enough. The education program should be sustainably conducted and become a routine agenda for the school (Wisnuwardani et al., 2023).

While the school tries to prevent anemia among students, it is also undeniable to consider the student's consumption habits. According to the World Health Organization (WHO), a change in dietary habits has been brought about by a rise in the manufacturing of processed foods, fast urbanization, and altered lifestyles. Nowadays, people are eating more meals heavy in fats, sugars that aren't processed, salt, and potassium. A number of students also don't eat enough fruits, vegetables, or other dietary fiber-rich foods like whole grains as a source of nutritional food. Adolescents should prevent this from happening by paying attention to what they consume as intake of certain types of nutrients, specific food groups, or overarching dietary patterns positively influences health and promotes the prevention of common non-communicable diseases (NCDs), including the increasing risk of anemia (Cena & Calder, 2020; Paramastri et al., 2021). Through the material explained above, students in Padjadjaran Vocational High School are expected to be more aware and educated about anemia although there are still challenges to face.

The challenge of preventing anemia can be found in the student's social conditions. An increase in food consumption outside home or less healthy food has been attributed to changes in demographic and socioeconomic variables. Adolescents find it easier to buy outside home food. Parents' income also determines the nutritional intake of their children. The lower the parents' income, the less their children can fulfill nutritional food (Denaya & Shofwan, 2023). This might cause unbalanced nutrition intake and health issues (Kim & Ahn, 2020). For balancing nutrition, students need more flexible meal plans, such as the capacity to change serving sizes, the number of meals served each day, or the inclusion of side dishes. However, the school has not been able to facilitate students to buy more healthy foods at school. This is due to the limited space of the canteen at the school. There are only two merchants in the canteen and both merchants have not provided healthy foods to students. To solve this, the school has the authority to set rules for merchants to support more healthy food sales.

The blood tablets supplement given to the students is also important. Beside curing the symptom effects, consuming routine supplement blood tablets is also essential for female students to prevent the long-term effects of anemia. When they grow up and are pregnant, those who have anemia would not be able to provide nutrients for themselves and the fetus in their womb, which can increase the frequency of complications, the risk of maternal death, prematurity rates, low birth weight (LBW), and perinatal mortality rates (Yuanti et al., 2020). This is in line with the regulation of the Minister of Health (Peraturan Menteri Kesehatan/Permenkes). According to Permenkes, RI No. 88, 2014, providing blood supplement tablets is one of the crucial initiatives in the management and prevention of anemia since it is a successful means of preventing anemia brought on by iron and folic acid deficiencies (Sari et

al., 2022). This is because deficiency in both macro and micronutrients might result in anemia. Hence, giving blood tablet supplements is able to fulfill those nutrients needed to produce blood for female students.

Providing female students with blood supplement tablets enhances their nutritional condition to break the cycle of stunting, and boost their body's iron levels. The recommended dose of tablets for female students is 60 mg elemental in the form of *ferrous Sulfate*, *ferrous fumarate*, or *ferrous gluconate*, together with 0.400 mg of folic acid given once a week and once daily during menstruation (Dewi et al., 2023). Research found that giving blood supplement tablets to female adolescents increases their hemoglobin levels so that prevents the risk of anemia (Hb<12 mg/dL) and reduces the prevalence of anemia in Indonesia (Nafis & Hilmi, 2022; Sari et al., 2022).

Further discussion will also provide challenges encountered during the implementation of blood supplement tablet. Several female students in Padjadjaran Vocational High School did not apparently consume the blood supplement tablets given by the school properly. Some of them did not necessarily consume the tablet and just keep it. On the other hand, they consume the tablet before they eat anything although the school has suggested to consume the blood supplement tablets after they eat. This behavior might be caused by the student's level of knowledge, attitudes, and support of health workers (Meika Sari et al., 2023). Adolescents also tend to like things that are found deviant (Sudirman et al., 2022). Although there are still challenges to implementing the program, Padjadjaran Vocational High School, along with Puskesmas Jatinangor, has put efforts into achieving "Indonesia Emas 2045" envisioned by the government of Indonesia. This research suggests that preventing anemia in female high school students is more complex due to, for example, the different habits, socioeconomic condition, and tendencies of the students. The school could set more strict rules to support the program, such as facilitating the students to buy healthier food at school and ensuring the students consume the blood supplement tablets by consuming the tablets simultaneously before or after the class. Rizka et al. (2020) also highlights, to increase students' literacy especially in anemia, there should be more collaborations, such as with communities or private institution.

## CONCLUSION

To realize "Indonesia Emas 2045", Indonesia should ensure the health of its young generations. Adolescents in Indonesia are now prone to anemia, one of which is in Padjadjaran Vocational High School. Padjadjaran Vocational High School is a private school located in Jatinangor, West Java Province, Indonesia. It has specific competencies in technology and business management. By December 2023, there are reportedly 129 female students in Padjadjaran Vocational High School. During their age, students, especially females, are prone to anemia—a condition in which there is a reduced number of hemoglobin (Hb) concentration and/or red blood cell (RBC) numbers lower than normal and inadequate to comply with an individual's physiological needs. To prevent this to happen, Padjadjaran Vocational High School, in collaboration with Puskesmas Jatinangor, has been conducting a program to prevent students from anemia. Based on the observation, interview, and documentation, it is found that the program was first started in early September 2022. The program includes anemia prevention dissemination to students in Padjadjaran Vocational High School which conducted every three months, anemia check-up to ensure students have not potentially suffered from anemia and prevent students from further disease, and providing blood supplement tablets to female students on every Friday. However, preventing anemia among students was not necessarily easy to run in accordance with the plan. Students' consumption habits, socioeconomic condition, and the tendencies of adolescents are undeniable factors to be faced. While there are several obstacles during the implementation of the program, the school keeps



evaluating the program to be able to achieve the aims as expected. For the future similar program, it is suggested to strengthen the connection between the parties involved (e.g. school and parents) by building a scheme so as to ensure students adhere to the program properly.

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