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## The Correlation of Length of Using IUD and Hemoglobin Levels in IUD Acceptors



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### Abstract

IUD is a device inserted into the uterus that is very effective and long term. Behind the success of IUD, there is a side effect that often occurs, called menorrhagia. Prolonged menorrhagia will cause a decrease in hemoglobin levels which can lead to anemia. The purpose of this study was to determine the correlation between the length of using intrauterine devices and hemoglobin levels in IUD acceptors at Keniten Village, Mojo District, Kediri Regency. This type of research was a quantitative research by using observational design with Cross-Sectional approach. The population in this study were 53 IUD acceptors by using Probability Sampling called Simple Random Sampling, which obtained 35 respondents. This research used questionnaires as the instrument to obtain general data, birth control participant card, and hemoglobin measurement tool with Easy Touch brand. There was a significant correlation between the length of using IUD and hemoglobin levels in IUD acceptors. So it can be concluded that the use of IUD for more than 5 years can potentially lead to a greater reduction of hemoglobin levels in IUD acceptors. This can be used as a source of reference for prospective IUD acceptors about side effects, prevention, and treatment if they experience side effects from IUDs.

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## INTRODUCTION

The World Health Organization (WHO) reported that the use of contraceptive in many regions was increased. The percentage of women using modern contraceptives such as IUDs has increased from 54% to 57.4% in the worldwide. From 23.6% to 27.6% was reported in Africa; from 60.9% to 61.62% was observed in Asia; and from 66, 7% to 67, 02% was recorded in Latin America and the Caribbean. (Ibrahim et al., 2022). The 2021 family data collection findings from BKKBN revealed that among family planning participants in Indonesia, the prevalence rate of Responsible for The Cooperation Project was 57.4% and 8% of them used IUDs. The 2021 Central Bureau of Statistics also stated that in East Java there were 61.77% Woman of Childbearing Age (WUS) who were active in using contraceptives. In 2020 in East Java there were 11.4% IUD users, 4.8% Female Surgery Methods (MOW) users, 0.36% Male Surgery Methods (MOP) users, 2.1% condom users, 11.6% implant users, 51.28% birth control injection users, and 18.2% pill users. (Central Bureau of Statistics, 2021)

According to the Kediri District Health Department in 2022, there were 197. 290 numbers of Couples of childbearing age (PUS) who actively follow birth control. The percentage of IUD users of 14.31%, Female Surgery Methods (MOW) 6%, Male Surgery Methods (MOP) 0.29%, Condom 1.57%, Implant 16.79%, Injectable 50.62%, and Pill 9.56%. From the data listed, the achievement of Birth Control Active at Kediri District in 2020 during the pandemic is still higher than the 71% of national target. (Kediri Health Profile, 2020).

The spiral contraceptive, or intrauterine device (IUD), is a type of long-acting reversible contraceptive implanted in the uterus to prevent pregnancy by blocking one or both tubes that carry sperm and eggs. The efficiency of this birth control method is quite high, at 0.6% to 0.8% (0.6 to 0.8 births by 100 women in the first year). Judging from its effectiveness and advantages, IUD is an appropriate long-term contraceptive method to reduce maternal mortality. (Anggraini et al., 2021)

Behind the success of IUDs, there are also side effects that can be detrimental to health. The adverse effects that are always being a complaint for IUD acceptors are uterine perforation and abortion, uterine cramping and bleeding, infection, and menorrhagia. Menorrhagia or more and longer bleeding is one of the most common effects complained by IUD acceptors.

(Novianti, F., & Sari, 2018). Twenty-four months after their IUD inserted, women who had not previously used birth control methods had their blood production increase from an average of 32 ml to a range of 52-72 ml. Since the IUD is firm and the uterus is soft, damage can occur if the two are in contact. This can cause more blood to be shed and blood patch occur between periods and spotting. Because this procedure injures the uterine area, having the IUD puncture the area causes more blood to be shed during menstruation and cause in longer periods than before using IUD (Revinovita, 2020). IUD users may experience symptoms of bleeding due to the activity of enzymes found in high concentrations in the lining of the uterus (endometrium). The enzyme is fibrinolytic (destroys fibrils). Fibrin is an important component of the clotting process. The mechanical factor can be also due to uterine contractions. This is due to the availability of IUD and the uterine cavity (*incompatibility*) (Marmi, 2016). IUDs can increase the loss of menstrual blood as much as 100%, which can lead to iron deficiency anemia if left untreated. Increase the number of blood cells that lost during bleeding or anemia, or make individual with anemia feels worse. The occurrence of iron deficiency anemia indicates that hemoglobin levels are also influential in excess blood loss which is one of the side effects of using IUDs. This is what makes a special concern for IUD family planning acceptors and can make one of the considerations for using the contraceptive. (A. K. Dewi, 2020)

Hemoglobin and hematocrit levels are checked annually for women with IUDs and if they report having heavy periods, according to most birth control clinics. (Leveno, 2019). It is possible to diagnose pelvic infection or ectopic pregnancy if there is excessive bleeding. If there are no pathological abnormalities, then counseling and monitoring on hemoglobin levels can be done. This hemoglobin level monitoring is used to determine whether the acceptor is anemic or not. If the Hb is less than 8 gr/dL and the usage is more than 3 months, the IUD can be removed with the consent of the IUD user (Ayu Anggraeni, 2022). Pharmacological therapy for menorrhagia can use Ibuprofen to reduce bleeding and give blood supplement tablets 1x1 tablet in a day (Nurannisa, 2021). Fera Novianti and Ika Novita Sari conducted a study in 2018 and found that among Birth Control-IUD acceptors in Tanjung Uma Village, Baja District, there was a correlation between menstrual

cycle duration and hemoglobin levels.

Based on preliminary study data, it was found that out of 37 districts in Kediri City, Mojo district was ranked as the top 8 users of intrauterine devices. In 2022 IUD users in Mojo District reached 19.64%. In addition, data obtained in 2018-2022 Keniten Village is 2nd ranked users of intrauterine devices out of 20 villages in Mojo District. Keniten Village has 53 IUD users out of 404 IUD users in Mojo district with percentage of 13.11%. From the data above, it can be seen that IUD users in Keniten Village, Mojo district are high. Based on direct brief interviews on September 5<sup>th</sup>, 2022 conducted by cadres in Keniten Village, Mojo district, it was said that IUD users were fewer than injectable users because prospective IUD acceptors were afraid because they received information from IUD users that IUDs caused the effects of more and longer menstruation, vaginal discharge, uncomfortable husband, and felt uncomfortable at the time of installation. On January 17<sup>th</sup> and 18<sup>th</sup>, 2023, a brief interview was conducted with IUD users in Keniten Village. From the brief interview, it was found that 8 of 10 IUD users experienced an increase in blood volume during menstruation compared to before using IUD. After considering the background that has been described previously, the researcher feels interested in exploring further on this topic. "The Correlation Between The Length of Using Intrauterine Device (IUD) And

Hemoglobin Levels in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency

## METHODS

This study used quantitative research with a cross-sectional approach. In this study, researchers conducted hemoglobin checks on IUD acceptors. The population in this study totaled 53 IUD acceptors. The sample in this study was IUD acceptors in Keniten Village who fell into the inclusion criteria that the researchers had set. Researchers used the Probability Sampling technique, called Simple Random Sampling, which totaled 35 IUD acceptors to determine the number of samples used in this research. The research setting used by the researchers was located at Keniten Village, Mojo District, Kediri Regency. The research time was held on May 30<sup>th</sup> up to 31<sup>st</sup>, 2023.

The data collection instrument in this study used a questionnaire to find out the general data of the respondents and an Easy Touch brand hemoglobin checker was used. When processing the data, the researchers first used univariate analysis to learn about the composition and shape of the respondent pool, and then the researchers used bivariate analysis to learn the correlation between independent and dependent variables with the help of Spearman Rank statistical test.

## RESULTS

### 1. The Length of Using Intrauterine Device (IUD) and Hemoglobin Levels in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency

Table 1: Distribution the length of using Intrauterine Device (IUD) at Keniten Village, Mojo District, Kediri Regency

The length of using IUD	Frequency	Percentage (%)
≤ 5 Years	11	31,4
> 5 Years	24	68,6
<b>Total</b>	<b>35</b>	<b>100</b>

From the table above, it can be seen that of all respondents, most of them used IUDs for more than 5 years with 24 respondents (68.6%).

### 2. Hemoglobin Levels in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency

Table 2: Distribution of Hemoglobin Examination Results in IUD Acceptors in Keniten Village, Mojo District, Kediri Regency

Hemoglobin Check Result	Frequency	Percentage (%)
Normal	22	62,9
Mild Anemia	7	20
Medium Anemia	6	17,1
<b>Total</b>	<b>35</b>	<b>100</b>

From the table above, it can be stated that from all respondents, the majority of IUD users does not feel anemia at 62.9%, 20% of mild anemia and 17.1% of moderate anemia.

### 3. The Analysis of Correlation Between The Length of Using Intrauterine Device (IUD) and Hemoglobin

**Levels in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency**

Table 3: Distribution Analysis of the Correlation between the Length of Using IUD and Hemoglobin Levels in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency.

Number	The Length of Use	Normal		Mild Anemia		Medium Anemia		Total		P-Value
		f	%	F	%	f	%	f	%	
1.	≤ 5 Years	10	45,5	0	0	1	16,6	11	31,4	0,035
2.	> 5 Years	12	54,5	7	100	5	83,4	24	68,6	
<b>Total</b>		22	100	7	100	6	100	35	100	

From the table above, it can be stated that respondents who used IUD for ≤ 5 years are 10 respondents (45.5%) who does not suffer from anemia and 1 respondent (16.6%) who suffered from moderate anemia. Meanwhile, respondents who used IUD for > 5 years showed that there are 12 respondents (54.5%) who does not suffer from anemia, 7 respondents (100%) who experienced mild anemia, and there are 5 respondents (83.4%) who experienced moderate anemia.

It is known that P-value is  $0.035 \leq 0.05$ , so it is stated that there is a significant correlation between the length of using IUDs and hemoglobin levels in IUD user. Therefore, it can be concluded that there is a correlation between the length of using IUDs and hemoglobin levels in IUD acceptors at Keniten Village, Mojo District, Kediri Regency.

**DISCUSSION****The Length of Using Intrauterine Device (IUD) in IUD Acceptors at Keniten Village, Mojo District, Kediri Regency**

Based on the results of the study, it is known that there are 35 respondents who are IUD acceptors, the majority using IUD for more than 5 years is 24 acceptors (68.6%) and there are 11 acceptors (31.4%) who use IUD for less than 5 years. This shows that the majority of IUD acceptors have installed IUD at least once.

The results of the research above are in accordance with previous research conducted by (C. P. L. Dewi & Etik Khusniyati, 2018) which stated that the majority of IUD users were more than 5 years totally 24 respondents (50%). The results of this study also stated that the majority of IUD acceptors are in the age range of 41-50 years totally 17 respondents (48.6%). Most respondents aged 41-50 years used IUD for more than 5 years, totally 15 respondents. This shows that respondents aged 41-50 years feel the effectiveness of using IUDs. This is in line with the book written by (Puspawati, 2022), which explained that factors affecting the effectiveness of using IUD include age, parity, and frequency of intercourse. The age factor is one of the factors that affect the effectiveness of the IUD because the older the age, the lower the pregnancy rate, expulsion and removal or removal of the IUD. It can be interpreted that the older the IUD user, the higher the effectiveness of the IUD.

In the researcher's opinion, IUD acceptors of

more than 5 years with a majority aged 41-50 years are more because IUD acceptors feel comfortable in using IUDs such as no need to remember, long-term methods, and no interaction with the drugs. In addition, IUD acceptors at the age of 41-50 years feel that IUD is the most effective contraceptive as the theory has been mentioned. This can also be seen from IUD acceptors who have removed the IUD and then reinstalled it again.

**Hemoglobin Levels in IUD Acceptors in Keniten Village, Mojo District, Kediri Regency**

Based on the results of the study above, there are 22 respondents (62.9%) with normal hemoglobin levels (>12 gr/dl), 7 respondents (20%) are in the mild anemia classification (11 gr/dL - 11.9 gr/dL), and 6 respondents (17.1%) are in the moderate anemia classification (8 gr/dL - 10 gr/dL). From filling out the questionnaire, it was found that most respondents experienced an increase in blood volume after using an intrauterine device (IUD) totally 20 respondents (57.1%). This is in line with the research (Zainiyah et al., 2019) which explained that 14 out of 19 Copper-T Cu 380A IUD users mostly (73.7%) have normal hemoglobin levels of ≥ 12 gr/dL. In addition, this study also explained that 17 out of 19 Nova-T IUD users mostly (89.5%) also had normal hemoglobin levels of ≥ 12 gr/dL. Furthermore, research from (Novianti, F., & Sari, 2018) there were 45 people with normal hemoglobin (61.6%) among IUD users, while 28 people had abnormal hemoglobin levels (38.4%). Supported by research (Revinovita, 2020) explained

that because the base of the IUD is solid, it can cause damage to the uterine lining if it comes into contact with the uterine wall. This is what may cause spotting, or the release of small amounts of blood outside of a woman's regular menstrual cycle. Similarly, the menstrual cycle increases the amount of blood shed as the lining of the uterus deteriorates. Since the procedure injures the uterine area, having the IUD that puncture the area will cause more blood flow during menstruation. The increased blood volume experienced by IUD acceptors is related to the hemoglobin levels in IUD acceptors. In the Research (Yudianti et al., 2018) explained that out of 33 respondents there are IUD acceptors who experienced the most side effects, which is menorrhagia (excessive menstrual bleeding caused by things outside the disease) amount 14 respondents (42.4%).

Based on the results of this study there are also 18 respondents (51.4%) who experienced an increase in the period of menstruation after using an IUD. This is relevant to the research from (Novianti, F., & Sari, 2018) entitled "Correlation between the length of menstruation and HB levels in IUD acceptors at Tanjung Uma Village, Lubuk Baja District." the test results showed that the p-value is 0.03 and the OR (Odds Ratio) value is 4.431. The p-value is 0.003 with a significance limit of 0.05. This means that the p-value of  $0.003 < 0.05$ , so it can be concluded that  $H_0$  (null hypothesis) is rejected. This indicated that there is a correlation between the length of menstruation and hemoglobin levels in Birth Control-IUD acceptors at Tanjung Uma Village, Lubuk Baja District, Batam City. The researchers assumed that the increase in menstrual blood volume and the increase in menstrual period after using IUD can affect the hemoglobin level of IUD acceptors at Keniten Village, Mojo District, Kediri Regency. This doesn't affect the number of IUD users at Keniten Village, which is the largest acceptor in Mojo Sub-district.

### **The Correlation of The Length of Using Intrauterine Device (IUD) and Hemoglobin Levels**

Based on the results of the study above, it stated that respondents who used IUD for  $\leq 5$  years there are 10 respondents (45.5%) who does not suffer from anemia and 1 respondent (16.6%) who suffered from moderate anemia. While respondents who used IUD for  $> 5$  years there are 12 respondents (54.5%) who does not experience anemia, 7 respondents (100%) who felt mild anemia, and there are 5 respondents (83.4%) who felt moderate anemia. The results of manual Spearman Rank analysis in this study

obtained that the P value is 0.38 and the P table is 0.335 which means that  $P \text{ count} > P \text{ table}$  which means  $H_0$  is rejected and with the help of a computer program obtained P-Value  $(0.035) \leq \alpha \text{ value } (0.05)$  which means  $H_0$  is rejected. Therefore, it can be concluded that there is a significant correlation between the length of using intrauterine devices (IUD) and hemoglobin levels in IUD acceptors at Keniten Village, Mojo District, Kediri Regency.

The results of the research above are supported by the theory contained in the book written by (Amalia, 2017) there are several side effects of using an IUD, one of the side effect is heavy bleeding or longer than normal menstrual cycles. This is not dangerous and the bleeding will decrease over the time. If the bleeding continues to be very heavy and prolonged, especially if there are clinical signs of anemia, or if the woman cannot accept the bleeding, then remove the IUD and replace it with another method because it is feared that the acceptor will experience a decrease in hemoglobin and cause anemia. The research is relevant to the research conducted by (Nadhiroh, 2022) entitled "The Correlation between the Length of Using Birth Control IUD with HB levels in IUD Acceptors" conducted by 11 respondents at Tanah Kali Kedinding Health Center work area. This study obtained a Chi-Square test for statistical significance resulting in  $X^2 \text{ count} > X^2 \text{ table}$ , or  $7.236 > 3.841$ . Therefore, it is reasonable to conclude that IUD family planning acceptors around Tanah Kali Kedinding Health Center have higher Hb levels the longer they use the device. The same result is also shown in the study (Sulistiyanti, 2023) entitled "The Correlation Between Length of Using IUD Contraceptive Method and the Incidence of Anemia in IUD Birth Control Acceptors" It was found that Seven respondents (11.67%) out of twenty respondents who reported anemia and long term use of IUD for birth control (21.67%) were equally divided between those with and without anemia. Thirty-one (51.67%) of the forty respondents who had used IUDs for birth control for a long period of time were anemic, while nine (15%) were not. Using the Chi-Square test, the researcher found a significance level of  $p=0.003$  at  $\alpha=0.05$ . Contraceptive acceptors had a lower risk of anemia than non-acceptors, according to statistical analysis (p value 0.05). According to the theory written in the book (Amalia, 2017) revealed that a common side effect and complication of prolonged using IUD is longer and more profuse menstrual bleeding (menorrhagia) for which the cause is uncertain. Increasing fibrinolytic activity and clotting of

occluded blood is likely due to the increase of concentrations of plasminogen activator in the endometrium, triggered by IUD implantation. If this is not prevented and treated, it is feared that the longer IUD users, using IUDs can cause a decrease in hemoglobin levels and cause anemia.

Researchers argued that the length of using contraceptives (IUD) is related to hemoglobin levels of IUD acceptors. This is related to the side effects of using IUD itself, which is an increase in blood volume and an increase in the period of menstruation so that if this situation is not prevented or treated, IUD acceptors can experience a decrease in hemoglobin levels which can continue to become anemia.

## CONCLUSION

From this study it can be concluded that based on the results of the study, the majority used IUDs for more than 5 years at 68.6%, then the majority of IUD users experienced normal hemoglobin levels, namely at least 12 gr/dL or more, with a proportion of 62, 9%, and it can be concluded that there is a correlation between the duration of IUD use and hemoglobin levels because the P-Value (0.035) is smaller or equal to the value (0.05), so the null hypothesis (H0) can be rejected.

## SUGGESTION

Community health centers and health workers can provide education to prospective IUD acceptors about the side effects of using the IUD. In addition, education can also be given on how to prevent and treat if the IUD acceptor experiences side effects from the contraceptive device. For future researchers, it is hoped that they can conduct research using other methods and types of research, namely qualitative research to find out more about the correlation between duration of IUD use and hemoglobin levels.

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## CONFLICTS OF INTEREST

We declare that there is no conflict of interest in publishing this article.

## AUTHOR CONTRIBUTIONS

The first researcher as the person doing the research. the second and third researchers as supervisors in conducting research.

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