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RELATIONSHIP BETWEEN TYPE OF CONTRACEPTIVE USE AND MENSTRUAL PATTERN AMONG FAMILY PLANNING ACCEPTORS IN THE WORKING AREA OF LAMASI PUBLIC HEALTH CENTER LUWU REGENCY

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Abstract

Contraceptive methods, both hormonal and non-hormonal, are widely used to prevent unintended pregnancies and regulate birth spacing. However, their impact on menstrual patterns varies and can influence user satisfaction, adherence, and continuation rates. Limited evidence exists regarding method-specific menstrual changes in rural Indonesian primary healthcare settings. This study aimed to examine the association between contraceptive type (hormonal vs. non-hormonal) and menstrual patterns among family planning acceptors at Lamasi Public Health Center, Luwu Regency, Indonesia.

An analytic observational study with a cross-sectional design was conducted from September to December 2025. A total of 279 women actively using contraception were selected through purposive sampling. Data on demographic characteristics, type of contraceptive, and menstrual patterns over the last three cycles were collected using structured questionnaires. Associations were analyzed using chi-square tests. Among participants, 61.3% used hormonal contraceptives, and 38.7% used non-hormonal methods. Irregular menstrual patterns were reported by 51.6% of participants, predominantly among hormonal contraceptive users (38.7%) compared with non-hormonal users (12.9%). Three-month injectable contraceptives (DMPA) had the strongest association with menstrual irregularities ($p < 0.001$), followed by one-month injectables ($p = 0.035$) and copper IUDs ($p = 0.006$). Combined oral contraceptive pills and sterilization methods showed more balanced or regular menstrual patterns. Findings suggest that menstrual changes are method-specific and influenced by hormonal mechanisms as well as individual factors, including age, parity, and physiological condition.

Hormonal contraceptives, particularly long-acting progestin injectables, are more likely to cause menstrual irregularities. These results emphasize the need for individualized, evidence-based counseling to inform acceptors of potential menstrual changes, improve adherence, and guide method selection. Future studies should explore method-specific effects and additional determinants such as duration of use, BMI, stress, and reproductive history.

Keywords: contraceptive methods, hormonal contraception, non-hormonal contraception, menstrual pattern, family planning, reproductive health.

1. INTRODUCTION

Family planning is a critical public health strategy aimed at preventing unintended pregnancies, regulating birth spacing, and improving maternal and child health outcomes [1,2]. Despite the long-standing implementation of family planning programs in Indonesia, variability in contraceptive method choice and its physiological effects remain significant concerns. Among contraceptive methods, hormonal options including pills, injections, and implants are widely utilized for their high efficacy but have been associated with menstrual disturbances such as irregular cycles, spotting, prolonged bleeding, and amenorrhea [3,4]. Non-hormonal methods, such as intrauterine devices (IUDs), condoms, and sterilization, generally do not alter systemic hormonal levels and are less frequently linked to menstrual irregularities [5].

Recent studies emphasize that while contraceptive use is beneficial, the side effects on reproductive health can influence user satisfaction, adherence, and continuation rates [6]. International reviews indicate that changes in menstrual patterns can significantly impact quality of life, with hormonal methods often producing predictable but individualized alterations in endometrial response and hypothalamic-pituitary-ovarian axis regulation [1,3]. Scoping reviews and meta-analyses reveal that contraceptive-induced menstrual changes are common globally, highlighting the necessity of comprehensive counseling and evidence-based management strategies [2,3,4].

Several previous studies in Indonesia have reported that hormonal contraceptive use is associated with menstrual disturbances, particularly among injectable contraceptive users [1,2,3]. International studies have also explained that hormonal contraceptives may alter endometrial response and bleeding patterns through suppression of ovulation and hormonal regulation mechanisms [4,5]. However, most previous studies focused only on specific hormonal methods, such as injectable contraception or implants, and were conducted in urban or hospital-based settings. Limited studies have compared hormonal and non-hormonal contraceptive methods simultaneously among family planning acceptors in primary healthcare settings, particularly in rural areas of Indonesia.

Despite this evidence, there is a gap in understanding the patterns of menstrual disturbances, specifically among women in Indonesia using different contraceptive methods, particularly at community health centers such as Lamasi Public Health Center, Luwu Regency. Local studies have reported varying rates of menstrual irregularities. Still, systematic assessment of the relationship between contraceptive type and menstrual pattern, along with consideration of demographic and behavioral factors, is limited [7,8,9,10].

This study addresses this gap by analyzing the association between the type of contraceptive used, hormonal versus non-hormonal, and menstrual patterns among family planning acceptors in the working area of Lamasi Public Health Center. By incorporating findings from both international literature and local Indonesian studies, this research aims to provide novel insights into how contraceptive method selection impacts menstrual health in a real-world Indonesian context, especially in the Lamasi context, thus supporting more individualized and informed family planning counseling.

The novelty of this study lies in the comparative analysis of contraceptive types among community-based acceptors in a primary healthcare setting using recent evidence-based references and local reproductive health data. The findings will contribute to the development of targeted counseling strategies that address both efficacy and quality-of-life concerns in contraceptive use.

2. METHODOLOGY

This study was an analytic observational study with a correlational approach and a cross-sectional design. The study was conducted in the working area of Lamasi Public Health Center,

Luwu Regency, from September to December 2025. The ethical clearance was obtained from the Health Research Ethics Committee Kepanjen University (Approval Number:734/S.Ket/KEPK/UK/IX/2025). Informed consent was obtained from all participants before data collection, ensuring confidentiality and voluntary participation.

The sample size was calculated using the Slovin formula with a 10% margin of error, resulting in 279 respondents. A 10% margin of error was chosen, considering the large population size (3,080 women) and the logistical constraints of conducting primary data collection across the Lamasi Public Health Center's coverage area. Additionally, this study has an exploratory and descriptive aim, focusing on identifying general patterns of contraceptive use and menstrual changes. Using a 10% margin allowed for a feasible sample size while maintaining acceptable precision for initial trend analysis. Future studies with more resources and narrower objectives could consider a 5% margin of error to increase precision. Purposive sampling was selected to ensure that the study specifically included women who were active contraceptive users in the working area of Lamasi Public Health Center and met the inclusion criteria (willing to participate, able to read and write, and residing in the study area). This approach allows researchers to target a relevant subset of the population that can provide the most informative data regarding the relationship between contraceptive type and menstrual patterns, especially when studying specific phenomena in a well-defined population. For future studies aiming to increase representativeness and reduce selection bias, a probability sampling method, such as stratified random sampling, could be employed. This would allow each member of the population an equal chance of selection, enhancing external validity and providing more precise estimates of menstrual pattern prevalence across all contraceptive users. The variables in this study were measured using direct categorical questions. Contraceptive type was classified into two categories: hormonal (including pills, injections, and implants) and non-hormonal (including intrauterine devices, condoms, and sterilization). Menstrual pattern was categorized as regular or irregular based on respondents' self-report over the last three menstrual cycles, following standard clinical definitions used in reproductive health surveys. Since these variables are objective, categorical measures, they do not require psychometric validation or internal reliability testing such as Cronbach's Alpha.

3. RESULTS

A total of 279 family planning acceptors participated in this study. Most respondents were of reproductive age, had completed senior high school education, and worked as housewives.

***Table 1**. Characteristics of respondents*

Characteristics	n	%
Age		
< 20 years	13	4.7
20-35 years	118	42.3
> 35 years	148	53
Education		
Primary school	2	0.7
Junior high school	10	3.5
Senior high school	140	50.2
Diploma	73	26.2
Bachelor degree	54	19.4
Occupation		
Housewife	148	53
Honorary employee	87	31.2
Midwife	14	5
Civil servant	26	9.4
Entrepreneur	4	1.4
Type of Contraceptive Method		
Combined oral contraceptive pills	29	10.4
One-month injectable contraceptives	55	19.7

Three-month DMPA injectable contraceptives	52	18.6
Implants	35	12.5
Copper IUDs	73	26.2
Condoms	20	7.2
Sterilization (Tubectomy/Vasectomy)	15	5.4
Total	**279**	**100.0**

Table 1 shows that most respondents were older than 35 years (53.0%), had completed senior high school (50.2%), and were housewives (53.0%). These characteristics indicate that most respondents were in the reproductive age group and were likely to be active users of family planning services. The distribution of respondents according to specific contraceptive methods used among family planning acceptors in the working area of Lamasi Public Health Center. The most commonly used contraceptive method was the copper intrauterine device (IUD), with 73 respondents (26.2%). This was followed by one-month injectable contraceptives, used by 55 respondents (19.7%), and three-month DMPA injectable contraceptives, used by 52 respondents (18.6%). Implant contraceptives were used by 35 respondents (12.5%), while combined oral contraceptive pills were used by 29 respondents (10.4%). Non-hormonal barrier methods, such as condoms, were used by 20 respondents (7.2%), whereas sterilization methods (tubectomy or vasectomy) were the least commonly used methods, reported by 15 respondents (5.4%). Overall, the findings indicate that injectable contraceptive methods and IUDs were the predominant contraceptive choices among respondents. The variation in contraceptive methods used in this study provides an opportunity to analyze differences in menstrual patterns according to each specific contraceptive method, rather than only comparing hormonal and non-hormonal categories broadly.

***Table 2**. Distribution of contraceptive use and menstrual pattern*

Variable	**n**	**%**
Type of contraception		
Non-hormonal	108	38.7
Hormonal	171	61.3
Menstrual pattern		
Regular	135	48.4
Irregular	144	51.6

Based on Table 2, most respondents used hormonal contraception (171; 61.3%), while 108 (38.7%) used non-hormonal contraception. Regarding menstrual patterns, most respondents experienced irregular menstrual patterns, totaling 144 respondents (51.6%), whereas 135 respondents (48.4%) reported regular menstrual patterns.

***Table 3**. Statistical Interpretation Analysis of Specific Contraceptive Methods and Menstrual Pattern*

Contraceptive Method	**Regular n**	**Irregular n**	**Total**	**Statistical Interpretation**
Combined oral contraceptive pills	13	16	29	Menstrual irregularity was slightly higher than regular menstruation, indicating a mild tendency toward menstrual disturbance.
One-month injectable contraceptives	17	38	55	Irregular menstruation was substantially higher than regular menstruation, suggesting a strong tendency toward menstrual cycle changes.

Three-month injectable contraceptives (DMPA)	10	42	52	This method showed the highest proportion of menstrual irregularities, indicating the strongest association with menstrual disturbances among hormonal methods.
Implant	12	23	35	Irregular menstruation was more common than regular menstruation, suggesting that implant use may contribute to menstrual pattern changes.
Copper IUD	43	30	73	Most respondents experienced regular menstruation, although menstrual disturbances were still found in a considerable proportion of users.
Condom	20	0	20	All respondents experienced regular menstruation, indicating that condoms had minimal influence on menstrual patterns.
Tubectomy/Vasectomy	9	6	15	Most respondents reported regular menstruation, suggesting relatively stable menstrual patterns among sterilization users.

Based on the distribution above, the tendency toward menstrual irregularities was highest among users of three-month injectable contraceptives (DMPA), followed by one-month injectable contraceptives and implants. In contrast, condom users showed entirely regular menstrual patterns, while IUD and sterilization users generally demonstrated more stable menstrual cycles. These findings indicate that each contraceptive method has different biological effects on menstruation. Therefore, analyzing contraceptive methods individually provides more clinically meaningful information compared with grouping all methods only into hormonal and non-hormonal categories.

Table 4. *Bivariate Analysis of Specific Contraceptive Methods and Menstrual Pattern*

Contraceptive Method	**Regular n**	**Irregular n**	**Total**	**p-value**	**Interpretation**
Combined oral contraceptive pills	13	16	29	p = 1.000	No significant association with menstrual irregularity
One-month injectable contraceives	17	38	55	p = 0.035	Significant association with menstrual irregularity
Three-month injectable contraceptives (DMPA)	10	42	52	p < 0.001	Strongest association with

					menstrual irregularity
Implant	12	23	35	p = 0.266	No statistically significant association
Copper IUD	43	30	73	p = 0.006	Significant association with menstrual pattern
Condom	20	0	20	p < 0.001	Strong association with regular menstrual pattern
Tubectomy/Vasectomy	9	6	15	p = 0.286	No statistically significant association

Overall analysis demonstrated a statistically significant relationship between specific contraceptive methods and menstrual pattern ($\chi^2 = 51.59$; df = 6; $p < 0.001$). Among all contraceptive methods, three-month injectable contraception (DMPA) showed the strongest association with menstrual irregularities, followed by one-month injectable contraception. These findings indicate that long-acting progesterone-based contraceptives tend to produce greater menstrual disturbances compared with other contraceptive methods. Although implant users also showed a higher proportion of irregular menstruation, the association was not statistically significant. Combined oral contraceptive pills demonstrated relatively balanced menstrual patterns and were not significantly associated with menstrual irregularities.

Among non-hormonal methods, copper IUD users still experienced significant menstrual changes, suggesting that menstrual disturbances are not exclusively related to hormonal exposure. In contrast, condom users demonstrated entirely regular menstrual cycles, indicating minimal biological influence on menstruation. These findings suggest that the effects of contraception on menstrual patterns are method-specific rather than merely based on broad hormonal and non-hormonal classifications.

4. DISCUSSION

The findings of this study demonstrate that contraceptive type is significantly associated with menstrual patterns among family planning acceptors in the working area of Lamasi Public Health Center. Based on the overall analysis, there was a statistically significant relationship between specific contraceptive methods and menstrual pattern, with chi-square analysis showing $\chi^2 = 51.59$, df = 6, and $p < 0.001$. Descriptively, menstrual irregularity was more frequently observed among hormonal contraceptive users, with 108 respondents experiencing irregular menstruation, representing 38.7% of the total sample, compared with 36 respondents, or 12.9% of the total sample, among non-hormonal contraceptive users. Conversely, regular menstrual patterns were more commonly reported among users of non-hormonal contraceptive methods. These results indicate that the type of contraception used is related to menstrual pattern changes; however, the relatively weak correlation suggests that menstrual irregularity should not be interpreted as being determined solely by contraceptive type. Rather, menstrual patterns are likely influenced by multiple interacting factors, including age, nutritional status, duration of contraceptive use, parity, breastfeeding status, stress, previous reproductive disorders, and individual hormonal responses. Therefore, the results of this study should be interpreted not as evidence that hormonal contraception inevitably causes menstrual disorders in all users, but as evidence that menstrual irregularity tends to occur more frequently among users of hormonal methods than among users of non-hormonal methods.

A more detailed method-specific interpretation provides a clearer understanding of this relationship. Among hormonal methods, three-month injectable contraception, particularly depot medroxyprogesterone acetate (DMPA), showed the highest proportion of menstrual irregularity, with 42 of 52 users, or 80.8%, reporting irregular menstruation. This was followed by one-month injectable contraceptives, in which 38 of 55 users, or 69.1%, experienced irregular menstrual

patterns, and implants, in which 23 of 35 users, or 65.7%, reported menstrual irregularity. In contrast, combined oral contraceptive pills showed a more balanced distribution, with 16 of 29 users reporting irregular menstruation. Among non-hormonal methods, condom users reported entirely regular menstrual patterns, whereas most copper IUD users also reported regular menstruation, although 30 of 73 users still experienced menstrual irregularity. These findings suggest that the effect of contraception on menstruation is method-specific rather than merely determined by broad hormonal and non-hormonal classifications. Long-acting progestin-based methods, especially DMPA, appear to have the strongest association with menstrual disturbance, while barrier methods such as condoms have minimal biological influence on menstrual regulation.

The researchers assume that the higher occurrence of menstrual irregularity among hormonal contraceptive users is mainly related to the effects of estrogen and/or progestin on ovulation, cervical mucus, and endometrial stability. Hormonal contraceptives, including pills, injections, and implants, prevent pregnancy by suppressing ovulation, thickening cervical mucus, and altering the endometrial environment. These mechanisms are effective for contraception but may also modify menstrual bleeding patterns. Progestin exposure may reduce endometrial proliferation, induce endometrial thinning, and alter vascular stability, resulting in spotting, prolonged bleeding, infrequent bleeding, changes in cycle length, or amenorrhea. The Family Planning: A Global Handbook for Providers published by the World Health Organization and Johns Hopkins Center for Communication Programs explains that changes in bleeding patterns are common side effects of several hormonal contraceptive methods and should be clearly communicated to users during contraceptive counseling [1]. This theoretical explanation is consistent with the present study, in which hormonal contraceptive users showed a higher frequency of irregular menstrual patterns than non-hormonal users.

The physiological basis of these findings is also supported by the U.S. Selected Practice Recommendations for Contraceptive Use, 2024, which state that spotting, light bleeding, heavy or prolonged bleeding, and amenorrhea may occur among users of implants and DMPA [2]. These changes are generally not harmful; however, they may affect comfort, satisfaction, adherence, and continuation of contraceptive use. The CDC also explains that irregular bleeding among implant users may be associated with endometrial atrophy, impaired angiogenesis, increased matrix metalloproteinase activity, and changes in prostaglandin mediators [2]. Thus, menstrual complaints among hormonal contraceptive users should not be regarded merely as subjective discomfort, but as clinically recognizable manifestations of biological responses to hormonal exposure. In this context, the findings from Lamasi have a strong biological rationale because hormonal contraceptive methods influence the reproductive system through both endocrine and endometrial pathways.

The high proportion of menstrual irregularity among DMPA users in this study is particularly important. DMPA is a long-acting progestin injectable method that maintains sustained progestin levels in the body. Continuous progestin exposure suppresses ovulation and alters endometrial development, which may lead to amenorrhea, spotting, or irregular bleeding. This finding is consistent with Yanti and Lamaindi, who reported that the duration of DMPA injectable contraceptive use was significantly associated with menstrual cycle disorders among family planning acceptors, with $p = 0.036$ [5]. Herlitawati also found a relationship between injectable contraceptive use and menstrual cycle changes among women in Berandang Village, Southeast Aceh [6]. Similarly, Safitri and Ermawati reported that users of three-month injectable contraception experienced more menstrual cycle changes than users of one-month injectable contraception, with $p = 0.000$ [7]. These findings strengthen the interpretation that progestin injectable methods, particularly DMPA, have a greater tendency to affect menstrual patterns than several other contraceptive methods.

The findings of this study are also consistent with other Indonesian studies that have examined the association between hormonal contraception and menstrual cycle changes. Adiesti and Wari found a significant relationship between hormonal contraception and menstrual cycle patterns, reporting that users of progestin hormonal contraception were more likely to experience abnormal menstrual cycles than users of combined hormonal contraception [8]. Ananda also reported a significant association between injectable contraceptive use and menstrual disorders

among family planning acceptors at Lubuk Buaya Public Health Center, Padang, with p = 0.003 [9]. In addition, Enggoe et al. found that menstrual disorders were associated not only with contraceptive type but also with nutritional status and duration of use of contraceptive pills, one-month injectables, and DMPA injectables [10]. The consistency between the present findings and previous Indonesian studies suggests that menstrual pattern complaints among hormonal contraceptive acceptors are not isolated phenomena in Lamasi, but are also observed in various family planning service settings across Indonesia.

In addition to injectable contraception, oral hormonal contraceptives may also influence menstrual bleeding patterns, although their effects may differ from those of injectable methods. In this study, users of combined oral contraceptive pills showed a more balanced distribution between regular and irregular menstruation, indicating that cyclic dosing may provide relatively more predictable bleeding patterns compared with long-acting progestin methods. Archer et al. explained that bleeding irregularity remains an important reason for discontinuation of oral contraceptive use and that different oral contraceptive formulations may produce different bleeding profiles [3]. Kaunitz et al., through a pooled analysis of two phase 3 trials evaluating a combined oral contraceptive containing estetrol/drospirenone, also demonstrated that bleeding and spotting patterns should be monitored across several cycles because individual responses may vary [11]. These findings are relevant to the present study because the hormonal contraceptive category included several methods, including pills, injections, and implants, each of which has different hormonal composition, dosing pattern, and biological effects on the endometrium.

Among implant users, the present study also found that irregular menstruation was more common than regular menstruation. This finding is supported by Mansour et al., who reported that initial bleeding patterns among etonogestrel implant users could predict subsequent bleeding patterns and were associated with discontinuation due to bleeding complaints [4]. Zheng et al., in a three-year observational study of etonogestrel implant users, also documented varied bleeding patterns, including amenorrhea, infrequent bleeding, frequent bleeding, and prolonged bleeding [12]. More recently, Torelli et al. found that unfavorable bleeding among etonogestrel implant users was associated with specific gene expression patterns in endometrial tissue [13]. These studies strengthen the interpretation that bleeding disturbances among implant users are related to biological endometrial responses to progestin and not merely to subjective perception or reporting bias.

Nevertheless, the presence of hormonal contraceptive users who maintained regular menstruation is also an important finding. In this study, 63 hormonal contraceptive users reported regular menstrual patterns. This indicates that responses to hormonal contraception vary between individuals. Such variation may be influenced by hormone type, dosage, duration of use, consistency of use, metabolic factors, breastfeeding status, body mass index, age, and reproductive health conditions. Tang et al. found that body mass index was associated with menstrual blood loss among women of reproductive age, although its relationship with cycle length was not always direct [14]. Therefore, the weak correlation observed in this study may reflect the fact that contraceptive type contributes to menstrual pattern changes, but it does not fully explain them. Other biological, nutritional, behavioral, and reproductive factors should be considered in future analyses to better understand why some users experience menstrual disturbances while others do not.

The findings among non-hormonal contraceptive users also require careful interpretation. Most respondents in the non-hormonal group experienced regular menstruation, which is biologically plausible because methods such as condoms and sterilization do not introduce systemic hormones and therefore do not directly suppress ovulation or alter hypothalamic-pituitary-ovarian axis regulation. However, the presence of 36 non-hormonal contraceptive users with irregular menstruation indicates that menstrual complaints are not exclusive to hormonal contraceptive users. Among copper IUD users, menstrual changes may occur due to local endometrial effects. The CDC notes that spotting, light bleeding, heavy bleeding, and prolonged bleeding may occur among copper IUD users, especially during the first three to six months after insertion, although these symptoms often decrease over time [2]. Thus, menstrual irregularity among non-hormonal contraceptive users should be interpreted based on the specific method

used, duration of use, and possible underlying conditions such as thyroid disorders, infection, endometrial polyps, myoma, pregnancy, or other gynecological problems.

Respondent characteristics should also be considered in interpreting the findings. Most respondents in this study were older than 35 years, a period in which some women may begin to experience hormonal fluctuation or early ovarian function changes before perimenopause. This may contribute to menstrual variability independently of contraceptive use. In addition, many respondents were housewives, which may influence access to health information, previous family planning experience, health-seeking behavior, and household decision-making regarding contraceptive selection. These factors may affect both the choice of contraceptive method and the interpretation of menstrual side effects. Therefore, the association between contraceptive type and menstrual pattern should be understood within a broader reproductive, social, and behavioral context. The findings do not imply that hormonal contraception always causes menstrual disorders; rather, they indicate that menstrual irregularity is more likely to be observed among hormonal contraceptive users, particularly users of progestin-based injectable methods.

The clinical significance of these findings lies in the need for individualized and evidence-based contraceptive counseling. Health workers, particularly midwives and family planning providers, should explain that changes in menstrual patterns are common among hormonal contraceptive users and are generally not signs of danger. However, these changes still need to be monitored because they may affect comfort, satisfaction, adherence, and continuation of contraceptive use. Counseling should distinguish between expected side effects, such as mild spotting or amenorrhea without other symptoms, and warning signs that require further examination, such as very heavy bleeding, prolonged bleeding, severe pelvic pain, symptoms of anemia, or new bleeding after a previously stable pattern. The CDC emphasizes the importance of exploring the user's goals, providing reassurance, offering management when needed, and respecting the acceptor's decision to continue or change contraceptive methods [2]. Therefore, the present findings support the need to strengthen counseling practices at primary healthcare centers by explaining method-specific menstrual effects before contraceptive initiation.

The novelty of this study lies in its direct comparison of hormonal and non-hormonal contraceptive methods among family planning acceptors in a rural primary healthcare setting. Many previous studies have focused on a single contraceptive method, particularly injectable contraception, or have been conducted in urban or hospital-based settings. By using data from Lamasi Public Health Center, this study provides local evidence from a community-based service context and demonstrates that menstrual outcomes differ not only between hormonal and non-hormonal categories but also across specific contraceptive methods. This distinction is clinically important because counseling based only on broad classifications may overlook the different risks associated with DMPA, one-month injectables, implants, pills, copper IUDs, condoms, and sterilization. The findings, therefore, contribute to more method-specific, context-sensitive, and patient-centered family planning counseling.

This study has several limitations. First, the cross-sectional design limits the ability to establish causality between contraceptive type and menstrual pattern. Second, purposive sampling may introduce selection bias and reduce generalizability to all family planning acceptors in other regions. Third, menstrual patterns were measured through self-report, which may be affected by recall bias or differences in individual interpretation of menstrual irregularity. Fourth, several potential confounding factors, including duration of contraceptive use, parity, body mass index, breastfeeding status, stress level, history of reproductive disorders, medication use, and endocrine conditions, were not analyzed in depth. These limitations may partly explain the weak correlation found in this study and indicate the need for more comprehensive analytical approaches in future research.

Overall, the results of this study strengthen the evidence that contraceptive type is associated with menstrual patterns among family planning acceptors. Hormonal contraception, particularly progestin-based injectable methods such as DMPA, tends to be more closely related to menstrual irregularity because of its effects on ovulation suppression and endometrial modification. Non-hormonal contraception generally has less influence on systemic hormonal regulation, although copper IUDs may still cause local endometrial bleeding changes. Future

studies should analyze contraceptive methods more specifically, including pills, one-month injectables, three-month injectables or DMPA, implants, IUDs, condoms, and sterilization, and should include duration of use, age, parity, body mass index, breastfeeding status, stress level, and history of reproductive disorders. Longitudinal designs and multivariate analyses are also recommended to clarify temporal relationships and control for confounding factors. Such evidence would support more accurate, individualized, and clinically meaningful contraceptive counseling in primary healthcare settings.

5. CONCLUSIONS

This study found a significant relationship between the type of contraceptive used and menstrual patterns among family planning acceptors in the working area of Lamasi Public Health Center, Luwu Regency. Menstrual irregularities were reported more frequently among users of hormonal contraceptive methods than among users of non-hormonal methods, particularly among acceptors using three-month injectable contraception or DMPA. However, the relationship should not be interpreted as the sole determinant of menstrual changes, because other individual factors such as age, duration of contraceptive use, parity, nutritional status, body mass index, breastfeeding status, stress, and history of reproductive disorders may also contribute to menstrual pattern variations.

These findings indicate that contraceptive counseling should not only emphasize contraceptive effectiveness but also provide clear, method-specific information regarding possible menstrual changes. In practical healthcare services, this can be implemented through structured pre-contraceptive counseling, including assessment of menstrual history, previous contraceptive experience, reproductive history, and user preferences before method selection. Health workers, particularly midwives and family planning providers, should explain the expected bleeding patterns of each method, such as spotting, irregular bleeding, amenorrhea, or heavier bleeding, and distinguish between normal side effects and warning signs that require further examination.

Practical implementation in primary healthcare services may include the use of a counseling checklist, menstrual pattern recording cards or menstrual diaries, scheduled follow-up visits after contraceptive initiation, and individualized counseling for users who experience menstrual complaints. Acceptors using hormonal methods, especially DMPA and other progestin-based contraceptives, should be advised to monitor menstrual changes and return for consultation if they experience very heavy bleeding, prolonged bleeding, severe pelvic pain, symptoms of anemia, or sudden changes after a previously stable menstrual pattern. For users who feel uncomfortable with menstrual side effects, health workers should provide management options, reassurance when symptoms are not dangerous, and alternative contraceptive choices according to the woman's reproductive condition and preference.

Therefore, the results of this study support the integration of evidence-based, method-specific menstrual counseling into routine family planning services at primary healthcare centers. Strengthening provider counseling skills, preparing simple educational materials, documenting menstrual complaints in family planning records, and establishing clear referral pathways for abnormal bleeding are important steps to improve contraceptive satisfaction, continuation, and reproductive health outcomes. Future studies are recommended to analyze specific contraceptive methods separately and include additional factors such as duration of use, age, parity, body mass index, breastfeeding status, stress level, and history of reproductive disorders using longitudinal designs and multivariate analysis.

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