

Factors influencing modern contraceptive usage among women aged 15-49 years: a cross-sectional study

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ABSTRACT

Introduction: Modern contraceptives are hormonal or non-hormonal medicines and medical procedures that prevent sexual reproduction. However, millions of reproductive-aged women globally cannot afford modern contraception, leading to unwanted pregnancies and unsafe abortions. This study aimed to examine the factors that influence modern contraceptive use among married women of reproductive age in Kirkuk City, Iraq.

Methods: A cross-sectional study was conducted to gather data from a convenience sample of 500 married women of reproductive age attending family planning units at 10 healthcare facilities, Azadi, Kirkuk Teaching Hospital, and private gynecological and obstetric clinics. Data were collected using a structured questionnaire from October 1st, 2023, to February 1st, 2024. The statistical analysis involved descriptive and inferential techniques.

Results: The prevalence of contraceptive use among participants was 74.6%, with about (21%) reporting condom use and (16.0%) withdrawal usage. However, intrauterine devices were reported in (12.6%). Side effects were significantly ($p < 0.001$) associated with contraceptive method choices, with 52% of the users experiencing adverse effects. External pressures to have additional children or become pregnant significantly ($p = 0.037$) influenced contraceptive method choices. There were fewer modern contraceptive methods due to unsafety (30.9%), discomfort (23.6%), and side effects, such as headache (18%), weight gain (16%), and irregular bleeding (14%).

Conclusions: Modern contraceptive use is affected by healthcare, safety, side effects, reproductive health, and personal choices. Providing complete knowledge and access to modern contraceptives helps couples make informed reproductive health decisions, empowers women to regulate their fertility, supports their personal and reproductive objectives, and promotes their health and well-being.

Keywords: birth control, childbearing age, Iraq, modern contraceptive, side effects

Introduction

Family planning enhances self-fulfillment, empowerment, and general wellness, thereby decreasing mother and infant mortality rates through the prevention of unintended pregnancies and unsafe abortions (World Health Organization, 2022). Contraceptive use reduces the health risks associated with pregnancy in both women and children. Contraceptive prevalence, as defined by the (WHO),

refers to the proportion of married or cohabiting women who use any form or technique of contraception (WHO, 2022). Previous research has shown that if the interval between births is fewer than two years, the rate of mortality in infants would be 45% higher than that in births that are spaced 2-3 years apart and 60% higher compared to births that are spaced four or more years apart (United Nation Population Division, 2019; Kantorová *et al.*, 2020). The WHO provides a wide



variety of birth control methods on a global scale. These methods include oral contraceptive pills, implants, patches, intrauterine devices (IUDs), injectables, condoms, male and female sterilization, vaginal rings as modern methods, lactational amenorrhea methods (LAM), withdrawal, rhythm methods, and fertility awareness-based approaches as traditional methods (WHO, 2023).

The global family planning unit or department provides a wide variety of interventions, including preconception counseling, infertility management, and sexually transmitted disease therapy (WHO 2023). The provision of family planning services has demonstrated consistent and continuous growth in many nations worldwide (WHO 2022). Additional advantages of family planning, other than the purpose of spacing or prolonging pregnancy, encompass the reduction of infant mortality, avoidance of HIV/AIDS and acquired immune deficiency syndrome, promotion of individual empowerment and educational progress, prevention of adolescent pregnancies, and control of population growth (Bongaarts and Hardee, 2019). Despite the availability of free or high-cost contraceptives from various healthcare institutions, both public and private, some women may choose not to utilize them because of constraints related to societal norms, cultural factors, financial limits, or inadequate access to healthcare services (Alrawi, 2021).

A study conducted in 2019 in Kirkuk reported that the prevailing contraceptive methods among married women were male condoms (50%), IUDs (28.7%), injections (14.9%), and oral contraceptive tablets (6.4%) (Ahmed et al., 2019). In Iraq, fertility rates remain elevated, and as of 2021, over 58% of married women in

their childbearing years have utilized family planning methods (Alrawi, 2021). In Kirkuk City, contraceptive use is limited, as only 51.3% of married women with children make use of any form of contraception. Furthermore, among those who used contraception, only 36.5% chose modern techniques. Nevertheless, the proportion of individuals in Kirkuk City who had their family planning needs fulfilled using modern techniques remained at a higher rate of 59.7% in 2018 (UNICEF, 2018). This research contributes to the existing knowledge on contraceptive dynamics among married populations, focusing on improving contraceptive literacy and promoting modern methods, which can positively impact women's reproductive health, decision-making, and overall quality of life. This research also explores the side effects of modern contraceptives, guiding the development of effective family planning programs. Thus, this study aimed to examine the factors that impact the use of modern contraceptive methods among married women of childbearing age residing in Kirkuk City.

Materials and Methods

Study design and participants

A cross-sectional study was conducted to gather data from a convenience sample, using convenience sampling as a non-probability method to select participants based on their accessibility. Convenience sampling offers several advantages, including simplicity, cost-effectiveness, ability to gather participants at a specific point in time, and suitability for exploratory research. In this study, a sample of 500 married women of reproductive age attending family planning units at 10

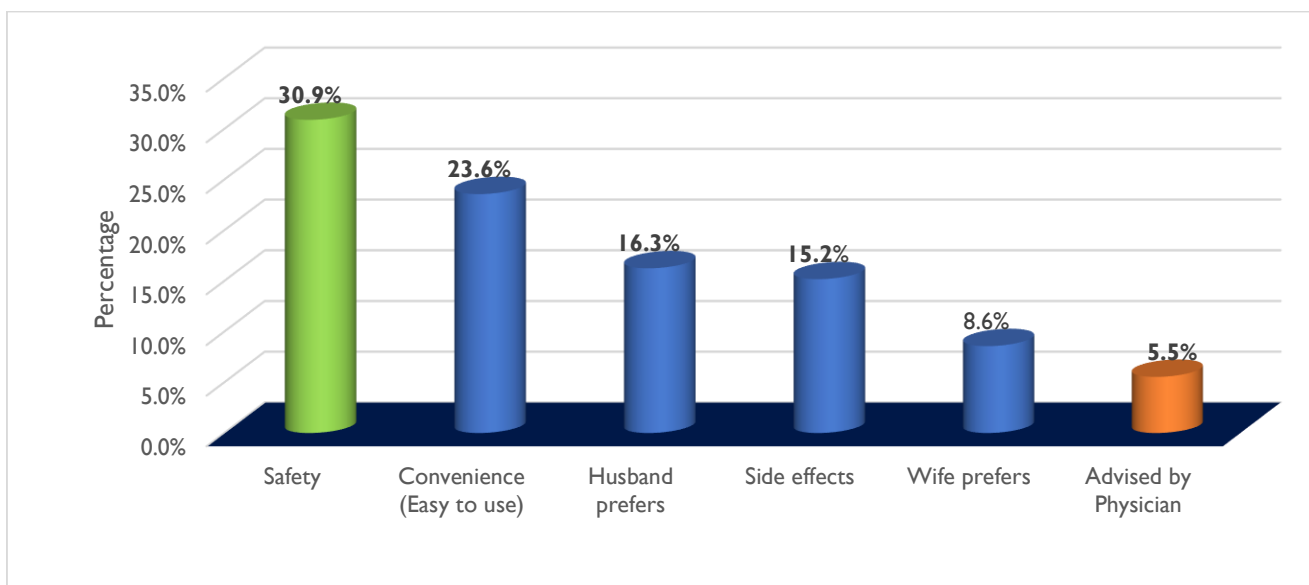


Figure 1 : Reasons for utilizing specific family planning methods among study participants n=373

primary healthcare facilities, Azadi Teaching Hospital, Kirkuk Teaching Hospital, and Private Gynecological and Obstetric Clinics were selected using convenience sampling (Figure 1). The data were collected using a structured questionnaire. As this study was designed as a cross-sectional study, the estimations for sample size calculation incorporated the following notations. The confidence level (Z) was set at 95% and was equal to 1.96. The prevalence of contraceptive use in Kirkuk City (P) is 51.3% (0.513) (UNICEF, 2018). The level of accuracy or sampling error (D) was set at 5% (0.05). The sample size was calculated using the following formula: sample size = $(Z^2 \times P \times (1-P))/D^2$ (Daniel and Cross, 2018). Therefore, the sample size was determined as 384 for an infinite population. However, a larger sample size enhances the generalizability and credibility of study findings and helps mitigate the potential for unrepresentativeness associated with convenience sampling (Littler, 2015; Memon et al., 2020). Hence, we recruited 500 women to enhance the generalizability of the findings. However, only 373 of the 500 currently used contraceptive techniques have been used. Therefore, the association was computed for 373 participants currently using contraceptive methods. The study included married women aged 15 to 49 years, while excluding those who expressed unwillingness to participate, pregnant women, and women who had undergone a hysterectomy.

Data Collection Tools and Techniques

Data for this study were gathered using a structured questionnaire administered through face-to-face interviews. The interviews were conducted from October the 1st 2023 to January the 1st 2024 in a confidential and comfortable environment. Anonymity and encouragement of participants' willingness to provide accurate and truthful responses were carefully considered.

The duration of each interview ranged from 15 to 20 min. After obtaining verbal consent from the participants, the questions were asked in their native language. The questionnaire design was influenced by a comprehensive investigation of the available literature on contraceptive use. The study covered a range of factors such as sociodemographic variables, reproductive health indicators, and data on contraceptive use. Sociodemographic factors included age, place of residence, religion, educational attainment of women and their spouses, monthly family income, and occupation. Reproductive health-related parameters included variables such as gravida, parity, history of miscarriage, number of children, age at

Table I: Demographic and reproductive characteristics of the study participants (n=500)

Items	n	%	
age	<20	5	1.0
	20 - 24	61	12.2
	25 - 29	120	24.0
	30 - 34	128	25.6
	35 - 39	110	22.0
	40 or more	76	15.2
Women Educational level	Illiterate	68	13.6
	Primary Graduated	95	19.0
	Secondary Graduated	87	17.4
	Institute Graduated	89	17.8
	College Graduated	161	32.2
	< 500,000	61	12.2
Monthly Family Income (Iraqi Dinar)	500,000-749,000	146	29.2
	750,001-1 million	153	30.6
	>1 million	140	28.0
Occupation	Employed	159	31.8
	Housewife	266	53.2
	Student	4	0.8
	Private work	71	14.2
Gravida	0	37	7.4
	1 - 2	175	35.0
	3 - 4	200	40.0
	5+	88	17.6
Para	0	37	7.4
	1 - 2	238	47.6
	3 - 4	178	35.6
	5+	47	9.4
Miscarriage	0	307	61.4
	1 - 2	183	36.6
	≥ 3	10	2.0
Number of children	0	51	10.2
	1 - 2	232	46.4
	3 - 4	174	34.8
	5+	43	8.6
Women age at marriage(year)	13 - 17	12	2.4
	18 - 22	231	46.2
	23 - 27	169	33.8
	28 - 32	85	17.0
	33 - 39	3	0.6
Interpregnancy interval(year)	Non	84	16.8
	1 - 2	324	64.8
	3 - 4	77	15.4
	5+	15	3.0
Menstrual cycle	Regular	304	60.8
	Irregular	196	39.2
	ND	280	56.0
Method of last delivery	C/S	183	36.6
	Nullipara	37	7.4

n = Frequency, %=Percentage, ND= Normal Delivery, C/S= Cesarean section

marriage, interpregnancy interval, menstrual cycle regularity, and method of last delivery. The inclusion of these characteristics aimed to evaluate the reproductive health condition of the participants and offer a framework for understanding their contraceptive preferences.

Statistical analysis

Data processing and analysis were performed using a statistical program SPSS, Version 27. Descriptive statistical analysis approaches, such as frequency and percentage, were used to summarize the samples and measurements. The study utilized inferential statistical techniques, namely the Fisher-Freeman-Halton Exact

Table 2: Contraceptive methods using currently among study participants (n=373)

Contraceptive methods currently using	n	%
Male Condom	105	21.0
Natural (withdrawal)	80	16.0
Intrauterine device (IUD)	63	12.6
Oral pill (COCP)	51	10.2
Injection(DMPA)	27	5.4
Oral pill (POP)	20	4.0
Skin patch (Implanon)	19	3.8
LAM (breastfeeding)	6	1.2
Rhythm method	2	0.4
Total	373	74.6

n = Frequency , %=Percentage

Test, to examine the relationships between categorical variables. This test was chosen because it is appropriate when the predicted count is less than 5 and exceeds 20% of the total count. Each test was considered significant at a p-value less than 0.05.

Ethics approval and consent to participate

The Kirkuk Nursing College Ethical Committee approved and granted data collection permits (Number

3 / 7 / 2340 on 19 / 10 / 2023). The authors received formal consent from Azadi and Kirkuk Teaching Hospitals (Number 713 on 31 / 10 / 2023). The researcher protected the privacy and ethics of the subjects. The researcher introduced herself and described the study's goal before involving participants, ensuring that the data would be safeguarded and used for research.

Results

Data of 500 married women of childbearing age (15-49) years who were attending the Family Planning Unit at 10 Primary Health Care Centers, Azadi Teaching Hospital, Kirkuk Teaching Hospital, and Private Gynecological and Obstetric Clinics were analyzed. One hundred twenty-eight women (25.6%) were aged 30 to under 35 years, and 153 (30.6) belongs to 750000-1 million (Iraqi Dinar) equivalent to (500 to 700 USD) monthly income. College graduates had the highest

Table 3: Factors influencing the choice of modern contraceptive methods among study participants. n=373

Items	Types of contraceptive methods currently used									Total(%)	Fisher Freman-Halton Exact Test	P-Value (Sig.)
	Oral pill (COCP)	Oral pill (POP)	IUD	Injection	Skin patch (Implanon)	Condom	Natural (withdrawal)	LAM (breastfeeding)	Rhythm method			
Side effects experiencing while using Contraceptive methods												
No	-	-	-	-	-	94 (25)	77 (21)	6 (2)	2 (1)	179(48)		
Yes	51 (14)	20 (5)	63 (17)	27 (7)	19 (5)	11 (3)	3 (1)	-	-	194(52)		
If (Yes): (n=194)												
Headache	11 (6)	8 (4)	-	4 (2)	7 (4)	5 (3)	-	-	-	35(18)		
Irregular bleeding	1 (1)	-	24 (12)	-	2 (1)	-	-	-	-	27(14)		
Weight gain	17 (9)	2 (1)	-	10 (5)	2 (1)	1 (1)	-	-	-	32(16)		
Fatigue	1 (1)	1 (1)	7 (4)	2 (1)	2 (1)	-	-	-	-	13(7)		
Backache	3 (2)	-	17 (9)	1 (1)	-	-	1 (1)	-	-	22(11)		
Nausea	8 (4)	7 (4)	1 (1)	2 (1)	2 (1)	-	-	-	-	20(10)		
Abdominal pain	2 (1)	-	-	2 (1)	-	3 (2)	-	-	-	7(4)		
Vertigo	-	-	-	1 (1)	-	-	-	-	-	1(0)	920.863	
Increase heartbeat	1 (1)	-	1 (1)	-	3 (2)	-	-	-	-	5(3)	<0.001(HS)	□
Pains in whole body	2 (1)	-	-	2 (1)	1 (1)	-	-	-	-	5(3)		
Depression	3 (2)	-	-	3 (2)	-	-	-	-	-	6(3)		
Nervous & Anxiety	2 (1)	2 (1)	-	-	-	-	-	-	-	4(2)		
Infection	-	-	6 (3)	-	-	2 (1)	2 (1)	-	-	10(5)		
Heavy menstrual bleeding	-	-	7 (4)	-	-	-	-	-	-	7(4)		
The final decision-maker in choosing reproductive decisions, such as the timing of the next birth and the number of children in the family												
Wife	6 (2)	5 (1)	4 (1)	4 (1)	1 (0)	15 (4)	13 (3)	-	-	48(13)		
Husband	9 (2)	7 (2)	12 (3)	6 (2)	4 (1)	13 (3)	10 (3)	1 (0)	-	62(17)		
Both	36 (10)	8 (2)	47 (13)	17 (5)	14 (4)	77 (21)	57 (15)	5 (1)	2 (1)	263(70)	17.455	0.295(NS)
Experiencing any pressure from spouse or family to have additional children or to become pregnant if haven't given birth yet												
Yes	16 (4)	11 (3)	17 (5)	9 (2)	8 (2)	29 (8)	16 (4)	2 (1)	2 (1)	110(29)	15.692	0.037(S)
No	35 (9)	9 (2)	46 (12)	18 (5)	11 (3)	76 (20)	64 (17)	4 (1)	0 (0)	263(71)		□

F.= Frequency , %=Percentage, □=Fisher-Freeman-Halton Exact Test, N.S = Non-Significant at P >0.05 , S = Significant at P ≤ 0.05 , H.S = Highly Significant at P ≤ 0.01.

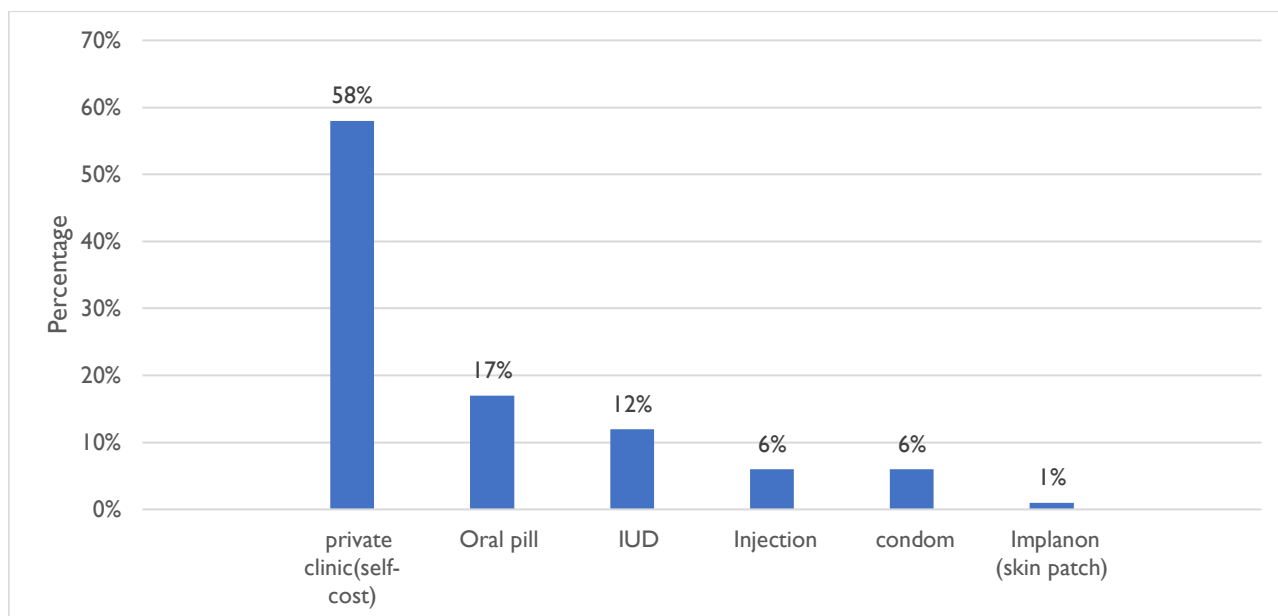


Figure 2: Contraceptive methods offered by FP units in primary health care centers and Hospitals n=373

education level (32.2%). Reproductive features showed that 200 women (40%) had 3-4 pregnancies and two handed thirty-two of women (46.4%) had 1-2 children. Three handed twenty-four women (64.8%) had a median interpregnancy interval of 1-2 years. The majority of the women (60.8%) experienced a regular menstrual cycle (Table 1). Of the 500 respondents, 373 (74.6%) reported using contraceptive methods, while 127 (25.4%) did not. Of the 373 participants who currently used contraceptive methods, condoms were the most popular, chosen by 21.0% (n=105) of the participants. Subsequently, natural withdrawal was observed in 16.0% (n=80), IUD in 12.6% (n=63), oral contraceptive pills containing COCP 10.2% (n=51), injections of 5.04% (n=27), progestin-only pills (POP) 4.0% (n=20), and skin patches (Implanon) (Table 2). The association between the nine contraceptive methods and side effects, as well as decision-making authority and pressure to become pregnant by the surroundings, are presented in (Table 3). The results revealed a strong significant association (Fisher-Freman-Halton Exact Test= 920.863, $p < 0.001$) between side effects and participants' choices of contraceptive methods. Among the 373 respondents currently using contraceptive methods, 52% reported experiencing adverse effects, whereas 48% did not. Most of the reported side effects were associated with modern contraceptive techniques, with headache (18%), weight increase (16%), and irregular bleeding (14%) being the most common side effects. The results also showed a significant association between the presence of external pressures from spouses or family members to have additional children or become pregnant and participants' choice of

contraceptive method (Fisher Freman-Halton Exact Test=15.692, $p=0.037$). However, decision-making authority did not significantly influence contraceptive method choices (Fisher-Freman-Halton Exact Test=17.455, $p=0.295$). Reasons for choosing specific family planning methods among study participants. The main reasons mentioned included safety (30.9%), convenience (23.6%), husband's preference (16.3%), and side effects (15.2%) (Figure 1). Availability of contraceptive techniques at primary healthcare centers and hospitals. The most commonly administered contraceptives were the combination oral contraceptive pill (COCP) and progestogen-only pill (POP), accounting for 17% and 12%, respectively. 58% of the respondents considered private clinics as a viable option for contraception (Figure 2).

Discussions

The findings of this study provide valuable insights into the usage and prevalence of modern and traditional contraception and health behaviors in women residing in Kirkuk City, Iraq. The study revealed contraceptive usage rates among the participants, reporting that 373 (74.6%) of married women used contraceptives, while 127 (25.4%) did not. The prevalence of contraceptive use is higher than that reported in Iraq in 2021 (58%), followed by neighboring countries, such as the UAE (33.4%), Kuwait (35.5%), and Saudi Arabia (66.5%) (United Nations, 2020; Alenezi and Haridi, 2021). The most commonly used contraceptive method is condom use, followed by natural contraception. These findings are consistent with the preference for traditional or natural withdrawal as a contraceptive method rather

than modern methods owing to its accessibility, lack of supplies or clinic visits, safety, lack of known adverse effects, and non-interference with breastfeeding. However, it is important to note that withdrawal is less effective than modern contraceptives. The study also found that a significant proportion of women used intrauterine devices (IUDs) and oral contraceptive pills (COCP), while other methods such as implants and injectables were less commonly used. These findings differ from those of a study conducted in Kirkuk City on displaced women, which reported a higher utilization rate of contraceptive pills and IUDs (Mustafa, [2019](#)). Variations in contraceptive preferences may be influenced by factors such as availability, cost, side effects, and personal preferences, which make modern methods less popular among study participants. These factors also influence modern contraceptive methods. Concerns about the side effects and misunderstandings surrounding modern contraceptives have been reported in previous studies and have significantly influenced the choice of modern contraceptive methods usage (Wasti, [2017](#); Imam and Khan, [2019](#); Berglas et al., [2021](#)). The study also found that the decision-making process regarding contraceptive methods involved both husbands and wives in most participants. This highlights the importance of including both partners in family planning decisions, and considering their needs and preferences. Additionally, the study revealed that private clinics were the preferred choice for obtaining contraception, which may be attributed to the lack of medical specialists, particularly for IUD insertion in family planning units, and the availability of the desired techniques. These findings are consistent with previous research highlighting the importance of addressing healthcare provider availability and the availability of desired contraceptive methods, particularly modern methods (Mushy et al., [2020](#); Salih, [2022](#)). This study also determined the cultural and societal factors that could indirectly affect women's contraceptive use in Iraq. The patriarchal nature of Iraqi society, cultural preferences for larger families, religious influences, and informal relationships all contribute to a complex set of factors that influence women's contraception use. These factors emphasize the need for comprehensive reproductive health interventions that consider cultural and societal contexts and promote gender equality and women's empowerment in Iraq, particularly in Kirkuk City. Furthermore, the study revealed that women aged 30–35 years comprised the largest age group, accounting for 25.6% of the participants. This age group is of particular importance in the context of

reproductive health and family planning initiatives as they have unique birthing and contraceptive needs and challenges. These findings are consistent with previous studies conducted in the Qaladzi district and Najaf City, which also found a high prevalence of women aged 30–37 years (Hussain and Lefta, [2020](#); Ibrahim and Abdulsahib, [2022](#)). This highlights the importance of considering regional variations in reproductive health needs and tailoring interventions accordingly. One significant finding of the study was the relatively common occurrence of multiple gravidae among the study population, with the highest percentage falling into the 3-4 pregnancies group at 39.4%. This finding is consistent with research conducted in Ethiopia, which showed a similar prevalence of 3-4 pregnancies (Geremew and Gelagay, [2018](#)). It is worth noting that while many women had experienced multiple pregnancies, a considerable number also had fewer deliveries, potentially due to factors such as fertility complications or personal choices. This finding contradicts a study conducted in Ethiopia, which reported that women had a median of 3 births, with a minimum of one and a maximum of 10 births (Gebremariam and Hadush, [2017](#)). These findings highlight the importance of reproductive health and family planning interventions that address the diverse needs and preferences of women in Kirkuk City. Miscarriage is another important aspect of reproductive health, and the study found that a substantial number of women (36.6 %) had experienced one to two miscarriages. This prevalence of miscarriage is consistent with a study conducted in Duhok, which reported a 39% prevalence in women with a history of miscarriages (Alsanity and Hasan, [2023](#)). Healthcare providers must address and support women who have experienced miscarriages, as evidence suggests that women should use contraception for at least six months after a miscarriage before attempting to conceive again to reduce the risk of another miscarriage (Yland et al., [2023](#)). This study also examined the interpregnancy interval (IPI) and menstrual cycle regularity, both of which are important factors in women's reproductive health. Most participants had an IPI of 1-2 years, with a high proportion experiencing short IPIs. Short IPIs have been associated with an increased risk of adverse maternal and fetal outcomes, such as preterm birth and low-birth-weight infants (Schmalenberger et al., [2021](#)). However, long-term IPIs may have their own set of challenges, including increased maternal age and declining fertility rates (Akamike et al., [2020](#)). Therefore, health care providers must educate women on the

importance of optimizing their IPIs for optimal maternal and infant health outcomes. Additionally, 39.2% of the participants reported having irregular menstrual cycles, which can pose challenges in accurately predicting ovulation and identifying the fertile window, reducing the chances of conceiving. Evidence reported that Modern contraceptives, particularly hormonal contraceptives, can alter menstrual cycles in several ways, including irregular bleeding and spotting, lighter and more regular periods, heavier bleeding, and missed periods of time. Combination methods such as pills, patches, and rings can make periods lighter, shorter, and more regular, whereas hormonal IUDs, such as Mirena, can reduce heavy bleeding and prevent missed periods (Baird and Glasier, 1993; Andi et al., 2014; Alyahya et al., 2019; Ahinkorah, 2020; Creinin et al., 2021). Addressing the underlying causes of menstrual irregularities can help improve the fertility outcomes in these women. In conclusion, the findings highlight the importance of addressing the unique needs and challenges of women in their twenties and thirties. These findings have important implications for reproductive health interventions and family planning initiatives in Iraq, and highlight the need for comprehensive approaches that consider regional variations, cultural factors, and the preferences of both partners. Future longitudinal studies are recommended to monitor contraceptive use over time and to identify patterns that can inform targeted interventions.

This study investigated the factors influencing modern contraceptive usage among married women of childbearing age in Kirkuk City, Iraq. It provides updated insights into the prevalence and modern contraceptive methods used by the participants. However, the study faced potential constraints due to cultural issues, such as limited women using modern contraceptive methods because of reproductive health and modern contraceptive literacy among participants. Another limitation of the study is the small number of reproductive-aged women visiting family planning centers. In addition, the use of convenience sampling resulted in a lack of generalizability because of sample bias. However, this limitation was fixed using a large sample size.

Conclusion

Health care availability, safety, side effects, reproductive health, and personal choices affect modern contraceptive use. Addressing these variables and providing thorough knowledge and access to modern contraceptives helps couples make informed

reproductive health decisions, empowers women to regulate their fertility, make decisions that supports their personal and reproductive goals, and improves health and well-being.

Availability of data and material

All data generated or analyzed during this study are available from the corresponding requests.

Funding Source

Not applicable.

Conflict of Interest

Not applicable.

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