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Assessment of dispensing and counseling practices of hormonal contraceptives among community pharmacists and pharmacist assistants in Erbil city: a cross-sectional study

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Abstract

Background and Objective: Hormonal contraceptives play a critical role in family planning and women's health, yet pharmacists' involvement in dispensing and counseling on their use remains underexplored in Iraq. This cross-sectional study investigates the dispensing and counseling knowledge of community pharmacists and pharmacy assistants in Erbil, Kurdistan Region, Iraq.

Methods: A total of 450 participants were recruited from 37 randomly selected quarters using cluster sampling. All pharmacies in these clusters were included, and all eligible staff were invited to participate. Data were collected via a structured questionnaire face to face covering demographics, contraceptive knowledge, dispensing and counseling practices, challenges, and pharmacy setting.

Results: The study identified notable knowledge gaps, especially regarding long-acting methods such as IUDs and injectables. While 78% believed they had adequate information for counseling, 27.8% lacked formal training. Familiarity was significantly associated with public sector employment (P <0.001), increased years of experience (P <0.001), and educational level (P <0.001). Although females showed higher familiarity than males, the association was not statistically significant (P = 0.554).

Conclusion: Although almost all pharmacists and assistants were familiar with hormonal contraceptives and willing to counsel, gaps in formal training specially on long-acting methods parsest. Familiarity was linked to experience, public sector work, and education. Structured, targeted training programs are essential to address the knowledge gaps in hormonal contraceptive methods, particularly among early-career pharmacists.

Keywords: Hormonal contraceptives; Community pharmacy; Pharmacists and assistants pharmacists.

Introduction

Hormonal contraceptives (HCs) are a widely used method for managing reproductive health and family planning.[1] Globally, an estimated 257 million women use hormonal contraceptives (HCs) to manage fertility and reproductive health. Despite their widespread use and clinical importance, access to accurate counseling and safe dispensing remains inconsistent, particularly in regions like Iraq.[2] These contraceptives function by altering the uterine lining to prevent implantation, thickening cervical mucus to block sperm, and influencing hormone levels to inhibit ovulation.[3] HCs are essential for addressing menstrual problems, preventing unintended pregnancies, and managing hormonal disorders, including polycystic ovarian syndrome (PCOS) and endometriosis. Various types of HCs are commonly used, including combined oral contraceptives (COCs), progestin-only methods (such as pills, injectables, and implants), as well as transdermal patches and vaginal rings.[4]

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The dispensing and counseling of hormonal contraceptives are crucial aspects of pharmacy practice that significantly impact patient outcomes.[5] Effective counseling improves patient understanding, promotes adherence, and ensures correct use of contraception. Pharmacists play an important role in identifying contraindications, managing side effects, and reducing unintended pregnancies.[6]

While HCs offer substantial benefits, such as high contraceptive efficacy and the management of gynecological disorders, they also pose risks, including cardiovascular events, breast cancer, and psychological effects.[7] Barriers to adherence and gaps in counseling, such as cultural misunderstandings, limited access to healthcare, and time constraints during counseling, have been identified.[8]

The role of pharmacists and pharmacist assistants in the dispensing of hormonal contraceptives is fundamental in ensuring patient safety and optimizing care.[9] Despite their crucial role, challenges such as knowledge gaps, time constraints, regulatory barriers, and patient misconceptions may hinder the delivery of comprehensive care.

Pharmacists' roles in hormonal contraceptive (HC) dispensing and counseling vary globally due to differences in healthcare systems, laws, and cultural norms.[10] In high-income countries, pharmacists can prescribe HCs, improving patient access, satisfaction, and compliance. In low- and middle-income countries, pharmacists face challenges like inadequate training and cultural barriers, which hinder effective counseling.[11,12]

In Erbil City, there are significant research gaps in understanding pharmacists' roles in HC counseling, cultural barriers, and the regulatory environment. Filling these gaps is crucial for improving access to contraception and maternal health outcomes, particularly in underserved communities.

This study aims to assess the dispensing and counseling practices of community pharmacists and pharmacist assistants in Erbil regarding hormonal contraceptives, and to identify the demographic and professional factors associated with knowledge and counseling quality.

Methods

Study Settings

This study was conducted in Erbil's city center, the capital of the Kurdistan Region of Iraq, a rapidly growing urban hub with numerous community pharmacies. These pharmacies play a vital role in family planning by dispensing hormonal contraceptives (oral pills, injectables, patches, and intrauterine devices) and providing patient counseling. The local regulatory framework allows accessible dispensing, influenced by the region's cultural norms.

Study Design

A cross-sectional design was employed to assess dispensing and counseling practices among community pharmacists and assistants.

Sampling Method and Sampling Size

The study focused on community pharmacists and pharmacist assistants working in Erbil's city center private pharmacies who were involved in dispensing hormonal contraceptives or counseling patients. Participants had to be willing to participate and provide informed consent. Eligible participants were defined as licensed community pharmacists or pharmacist assistants working in the selected pharmacies, directly involved in dispensing hormonal contraceptives or providing related counseling services.

A cluster sampling method was used, selecting 37 quarters from Erbil's 108 to represent the city center. The 37 quarters were selected using a simple random sampling technique, where each of the 108 quarters was assigned a number and clusters were selected randomly. This approach ensured geographic and demographic representation of the city center. All private pharmacies in these

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quarters were included. In each pharmacy, all eligible staff members present during the data collection visit were invited to participate. This approach minimized selection bias within pharmacies and ensured comprehensive data collection.

To determine the appropriate sample size, Epi Info software was used to calculate the required number of participants. The sample size was calculated using Epi Info based on a 24.5% estimated proportion of pharmacists' knowledge from a previous study done in Nigeria,[12] with a 95% confidence level, 5% margin of error, and an estimated population of 1000. Based on these parameters, the final sample size for the study was set at 450 participants. This ensured that the sample size was statistically adequate to represent the population accurately and yield reliable data on dispensing and counseling practices in the city center. This method also ensured efficient data collection within the designated timeframe while maintaining a structured and unbiased selection process.

Period of Study

The study has been conducted since October 2024 providing a snapshot of current practices.

Data collection occurred over three months, from December 2024 to February 2025, to ensure reliable participation and minimize variations in pharmacy practices.

Data Collection

Data was collected through face-to-face interviews directly via Google Forms. Efforts were made to interview participants during non-crowded times, although challenges led to fewer responses than expected per pharmacy. A total of 450 responses were collected.

The Questionnaire

Prior to data collection, the questionnaire was reviewed by academic experts in pharmacy and public health to assess its content validity, relevance, and clarity. Additionally, it was shared with a small group of pharmacy students and recent graduates to evaluate ease of understanding and practical usability. Following their feedback, minor modifications were made to the wording and structure of certain items to improve clarity. A pilot study was then conducted with 20 participants from non-sampled pharmacies in Erbil to test the finalized version. The pilot confirmed that the questionnaire was clear, feasible, and suitable for the study objectives.

The structured questionnaire consisted of five main sections. The first section gathered demographic and professional information, including participants' age, gender, professional role, years of experience, and type of pharmacy. The second section assessed knowledge of hormonal contraceptives and other contraceptive methods, with questions aimed at evaluating familiarity with various contraceptive options. The third section focused on dispensing practices and patient counseling, examining factors influencing dispensing, frequency of counseling, and sources of information used. The fourth section explored perceptions and challenges in contraceptive counseling, including participants' confidence, barriers faced, and willingness to undergo further training. The final section addressed the pharmacy setting and included an additional knowledge assessment to further gauge understanding of contraceptive-related practices. Provides context on the pharmacy setting and the respondent's knowledge of contraceptive methods.

The questionnaire was designed for clarity and ease of completion while ensuring comprehensive data collection.

Statistical Analysis

Data was analyzed using IBM SPSS Statistics version 25. The data was organized and cleaned in Microsoft Excel, then imported into SPSS for statistical analysis. Descriptive frequencies were used to summarize the data, and the Chi-square and Fisher's exact tests were applied to assess associations between the level of knowledge with variables like

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public employment, years of experience, educational qualifications, training in the field and gender. The results were presented in tables and graphs. A *P*-value of ≤0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for this study was obtained from the Ethics Committee of Hawler Medical University, College of Pharmacy, Department of Clinical Pharmacy/ Community Pharmacy (Reference No.: HMU-Ph-EC-16122021-143). Prior to participation, all respondents gave verbal informed consent after being fully informed about the purpose and scope of the study. Verbal informed consent was used due to the minimal-risk nature of the study and to accommodate participants during busy pharmacy hours. Confidentiality was always maintained, and participation was completely voluntary. No identifiable personal information was collected or reported, and the data was anonymized to protect the privacy of the participants.

Results

The analysis showed that study participants consisted primarily of females (59.1%) who were within the age range of 21–30 years (84.7%). The participants mostly achieved bachelor-level education (70%) while residing in urban neighborhoods (98.9%). The majority of participants identified themselves as Kurdish people (90%) and Muslim believers (98.4%). Among the respondents, 73% reported they did not work within the public services sector and 54% maintained one to five years of professional experience. Most survey participants worked in independent drugstores according to the data collected. All 450 distributed questionnaires were returned fully completed, resulting in a 100% response rate with no missing data. Table 1 presents demographic information about the study participants which offers an understanding of their basic characteristics.

Participating individuals received evaluations for their understanding and educational background with hormonal contraception. Table 2 shows the summary of key results according to findings recorded in this study. Many participants had limited knowledge about different types of hormonal contraceptives because they rated their familiarity with 64%. The majority of participants (78%) indicated they possessed enough information to give appropriate counseling about hormonal contraception. A total of 53.1% of respondents assessed their knowledge about different contraceptive methods as very good, though 43.1% described it as fair. A large percentage of 72.2% among the surveyed individuals received formal training regarding hormonal contraception.

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Table 1 Sociodemographic characteristics of the study samples (n=450)

Variable	Frequency	Percentage
Age		
21-30 years	381	84.7
31-41 years	69	15.3
Gender		
Male	184	40.9
Female	266	59.1
Educational Qualifications		
Institution Graduate	125	27.8
Bachelor's Degree	315	70
Master's Degree	8	1.8
Doctorate	2	0.4
Residence		
Urban	445	98.9
Rural	5	1.1
Ethnic Group		
Kurd	405	90
Arab	41	9.1
Turkman	2	0.4
Chaldean/Assyrian	2	0.4
Religion		
Muslim	443	98.4
Christian	7	1.6
Yazidi	0	0
Economic Status		
Less than Enough	32	7.1
Enough	383	85.1
More than enough	35	7.8
Working in the public sector		
Yes	120	27
No	330	73
Years of experience		
Less than 1	17	4
1 to 5	242	54
6 to 10	153	34
More than 10	38	8
Pharmacy location		
Independent pharmacy	341	76
Inside a polyclinic building	109	24

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Table 2 Pharmacists' knowledge of hormonal contraceptives (n=450)

Variable	Frequency	Percentage
How familiar are you with the various methods of hormonal contraception?		
Very familiar	157	34.9
Somewhat familiar	288	64
Not familiar	5	1.1
Do you believe you have enough information about hormonal contraception to conduct appropriate patient counseling?		
Yes	351	78
No	47	10.4
Not sure	52	11.6
How would you rate your knowledge about other types of contraception (e.g., IUDs, implants.)?		
Very good	239	53.1
Fair	194	43.1
Poor	17	3.8
Have you had any official training in hormonal contraception?		
Yes	325	72.2
No	125	27.8

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Pharmacists' familiarity with hormonal contraceptive techniques differed substantially. Almost all subjects (96%) expressed familiarity with oral contraceptive tablets when it came to technique recognition. Then came emergency contraception tablets, which 74.9% of people understood how to use. The intrauterine system (IUS) was identified by 30.4% of respondents, injectable contraception by 13.8%, and contraceptive patches by just 9.1%, demonstrating a considerable lack of familiarity with long acting or alternative types of contraception. These findings indicate that, while pharmacists are educated about regularly used approaches, there may be knowledge gaps regarding longer acting or less popular options.

Hormonal contraceptive training was also provided from a variety of sources. More than half of participants (50.7%) reported obtaining knowledge through on-the-job training, emphasizing the importance of practical experience. Online courses (20.7%) and seminars (36.1%) were also useful educational tools. Notably, just 5.1% of respondents stated that they had never received any formal training, implying that educational programs in this area should be improved. This data emphasizes the need for additional training opportunities, particularly for less commonly used contraceptive procedures as shown in Figures 1 and 2.

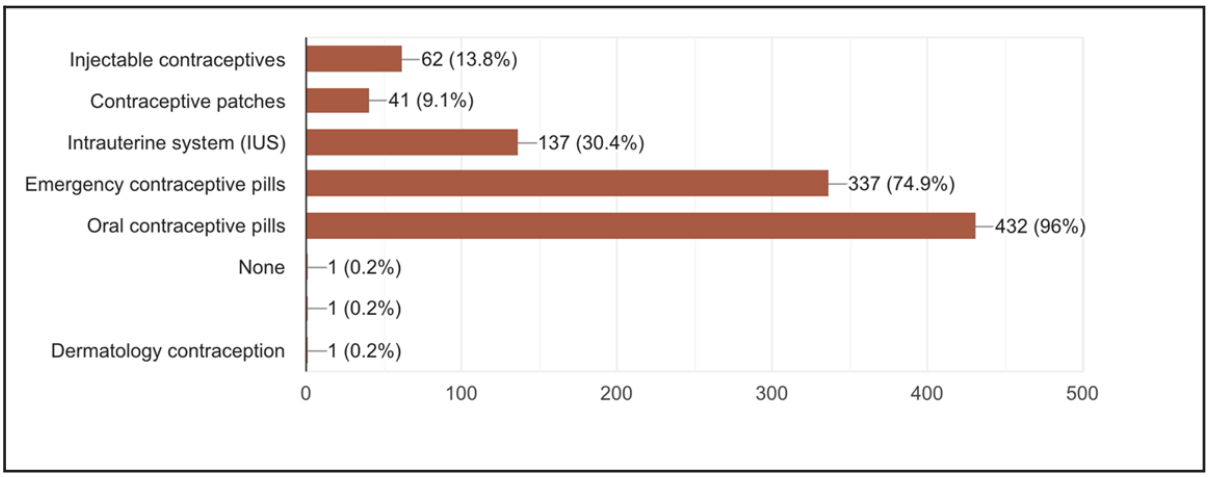

Figure 1 Most dispensed hormonal contraceptives

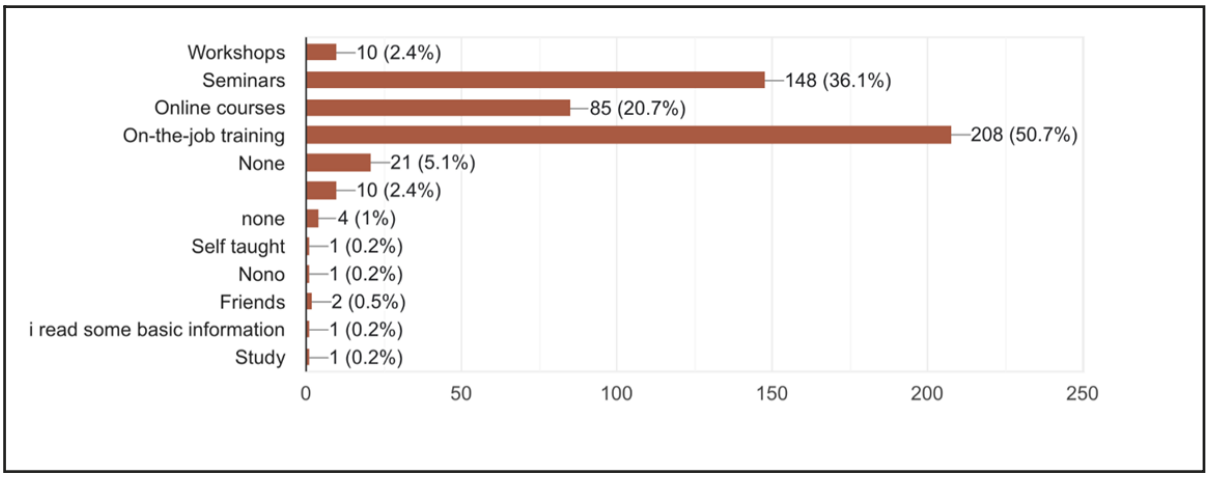

Figure 2 Types of training received by pharmacists and assistant pharmacists

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The participants' familiarity with hormonal contraception was found to be significantly connected to a variety of factors. Public sector workers were more familiar than those not in public employment, indicating that public employment played a role (*P* <0.001). Among public employees, 48.3% were very familiar and 51.7% were somewhat familiar. Among those not in public employment, 30% were very familiar, 68.5% were somewhat familiar, and 1.5% were not familiar. Individuals with over 10 years of experience demonstrated the highest levels of familiarity (63.2% very familiar, 34.2% somewhat familiar and 1% not familiar), while those with less than a year had the lowest familiarity level. (23.5% very familiar, 64.7% somewhat familiar, and 11.8% not familiar) (*P* <0.001). The biggest number of participants who claimed to be quite familiar came from institution graduates (52.8% very familiar, 44.8% somewhat familiar, 2.4% not familiar), whereas the majority of those with bachelor's degrees reported being moderately knowledgeable (72.1% somewhat familiar, 27.3% very familiar, 2.6% not familiar). Educational levels had an important influence on familiarity with hormonal contraceptives (*P* <0.001).

Furthermore, no individual who had received formal training reported not knowing about hormonal contraception, showing the importance of training programs (*P* <0.001). Among those with training, 34.8% were very familiar and 65.2% were somewhat familiar. Among those without training, 35.2% were very familiar, 60.8% were somewhat familiar, and 4% were not familiar.

In terms of gender, 60.5% of those who were very familiar, 58.0% of those who were somewhat familiar, and 80.0% of those who were not familiar were females. Conversely, 39.5% of the very familiar group, 42.0% of the somewhat familiar group, and 20.0% of the not familiar group were males. As shown in Table 3, these connections demonstrate the importance of education, training, and experience in determining pharmacists' familiarity with hormonal contraception.

Table 3 Association of the familiarity of the pharmacists and pharmacist assistants with a range of socio-demographic criteria and participants' training experience

Variable	Very familiar No. (%)	Somewhat Familiar No. (%)	Not familiar No. (%)	Total No. (%)	*P* Value
Public employment					
Yes	58 (48.3)	62(51.7)	0 (0)	120 (100)	<0.001
No	99 (30)	226 (68.5)	5 (1.5)	330 (100)	
Years of experience					
Less than 1	4 (23.5)	11 (64.7)	2 (11.8)	17 (100)	<0.001
1-5 years	75 (31)	165 (68.2)	2 (0.8)	242 (100)	
6-10 years	54 (35.3)	99 (64.7)	0 (0)	153 (100)	
More than 10 years	24 (63.2)	13 (34.2)	1 (2.6)	38 (100)	
Educational qualifications					
Institution graduate	66 (52.8)	56 (44.8)	3 (2.4)	125 (100)	<0.001*
Bachelor's degree	86 (27.3)	227 (72.1)	2 (0.6)	315 (100)	
Master's degree	4 (50)	4 (50)	0 (0.0)	8 (100)	
Doctorate	1 (50)	1 (50)	0 (0.0)	2 (100)	
Training					
Yes	113 (34.8)	212 (65.2)	0 (0)	325 (100)	<0.001
No	44 (35.2)	76 (60.8)	5 (4)	125 (100)	
Gender					
Male	62 (39.5)	121 (42)	1 (20)	184 (40.9)	0.554
Female	95 (60.5)	167 (58)	4 (80)	266 (59.1)	

*Fishers 'exact test was used.

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Discussion

According to this study, there are substantial differences between community pharmacists and pharmacist assistants' understanding of hormonal contraceptive knowledge. A vast majority of participants (64%) described their knowledge of hormonal contraceptives as “somewhat familiar.” Still, only 34.9% considered their knowledge as “very familiar,” while 1.1% disclosed limited knowledge or unfamiliarity with these contraceptives. Most pharmacists demonstrate a basic understanding of hormonal contraception, but their expertise could be insufficient for delivering complete patient counseling services. Cross-sectional studies from Mexico and Thailand, found that a significant proportion of pharmacists did not ask any questions to women before dispensing oral contraceptives.[13] The limited evidence from developing countries concerning pharmacists’ involvement in hormonal contraceptives reflected infrequent collection of patient medical history and limited engagement in patient counseling.[14]

Results of this study demonstrate a fundamental problem between how participants judge their knowledge and their actual knowledge. Participants indicated they had sufficient counseling information for their patients (78%), yet 27.8% of them lacked official training on hormonal contraception. The mismatch between how practitioners rate their knowledge and actual medical expertise indicates serious problems related to patient feedback or improperly handled counseling practices.

The absence of formal training emerges as a serious issue because it affects healthcare services for users of complex hormonal contraceptives and different usage patterns along with medication interactions. In contrast to certain developed countries The Accreditation Council for Pharmacy Education (ACPE), for example, mandates pharmacy schools in the United States to ensure that their graduates are prepared to provide patient-centered care, including appropriate evaluation and counseling.[15] In another study that was conducted in the USA, it was discovered that trained community pharmacists can effectively evaluate women for the safe use of hormonal contraception and select the appropriate products in the United States.[16]

Providing proper counseling requires expertise that reaches beyond determining contraceptive types since it necessitates the understanding of medication mechanisms and side effects as well as drug interactions and contraindications and patient-specific factors. According to another cross-sectional study conducted in the USA, 44% of respondents consistently provided contraceptive information and counseling.[17] Patient adherence and contraceptive effectiveness could be negatively influenced when pharmacists deliver insufficient or incorrect information due to lacking structured educational programs and training.

Pharmacists who had received training under the Patient Group Direction Protocol (PGD) were clinically qualified to offer oral contraception in community settings, and majority of the users were happy with the service. Before offering contraception treatments in the UK, pharmacists are required to finish the PGD and an MSc module on oral hormonal contraception services.[18] Community pharmacists in Erbil City are not required by pharmaceutical authorities or other organizations to test for the safe use of hormonal contraceptives and advise women on how to use them.

According to the current study, pharmacists with more years of experience and advanced degrees showed more knowledge and confidence regarding hormonal contraception (P <0.001). Those with bachelor's degrees or more were significantly more informed than those who had just graduated from the institutions, suggesting that formal academic education is a significant factor in shaping pharmacists' perceptions about

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contraception. To stay up with changing guidelines and new contraceptive options, pharmacists even those with advanced degrees need to continue their education. According to the study, 64% of participants had minimal knowledge of the various types of hormonal contraception. However, 78% were confident that they had the knowledge to provide appropriate hormonal contraception counseling. However, a previous study from Saudi Arabia found that just 24.5% of participants used effective counseling approaches, despite 72.7% having a thorough understanding of oral contraceptives.[19,20] Our study demonstrated a strong correlation between certain sociodemographic factors and participants' familiarity with hormonal contraception. However, the previously cited study from Saudi Arabia, revealed no link between contraceptive knowledge and sociodemographic variables. According to these findings, there may be disparities between perceived and actual knowledge, and sociodemographic variables may influence how pharmacists and pharmacist assistants perceive and give hormonal contraception counseling.

Female participants exhibited more familiarity with hormonal contraception than males. 60.5% of those who were very familiar were females compared to 39.5% males, and 58% of those who were somewhat familiar were females versus 42% males, although the difference was not statistically significant (P = 0.554). This shows that both genders received comparable degrees of training and education. However, cultural factors may influence the comfort and regularity of counseling provided by female pharmacists, necessitating additional research. To improve the use of hormonal contraceptives in Erbil city, a variety of measures could be taken, such as implementing established worldwide models along with creating protocols and resources such patient education leaflets and patient assessment checklists.

There are several limitations to the study. Firstly, when individuals misrepresent their level of experience or counseling techniques, self-reported data may be vulnerable to recall bias or social desirability bias. Additionally, the study was conducted solely in Erbil City, which would restrict the findings' generalizability to other parts of Erbil or the Kurdistan Region. Results might have been more accurate and comprehensive if pharmacists' actual counseling practices had been directly observed rather than relying just on self-reported answers.

Conclusion

The study found that almost all the pharmacists and pharmacist assistants were familiar with hormonal contraceptives and had received official training, primarily through seminars. Familiarity was significantly associated with public sector employment, longer professional experience, graduation from institutional programs, and prior exposure to relevant training. However, notable gaps in confidence and consistency in counseling practices remain, emphasizing the need for structured and standardized training programs. Variations in counseling frequency based on experience and gender suggest the importance of implementing targeted approaches, such as continuing education modules, gender-sensitive communication training, and policy-level support. Future research should assess the effectiveness of these interventions and explore systemic barriers to effective contraceptive counseling through observational and qualitative methods.

Competing interests

The authors declare that they have no competing interests.

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