

## Knowledge, Attitude, and Practices of Iraqi Community Pharmacists Toward Emergency Contraceptives (Conference Paper) #

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### Abstract

Emergency contraceptives (ECs) are indicated for preventing the chance of unintended pregnancy that follows unprotected sexual intercourse in cases of incorrectly used regular contraceptives and in sexual assault. It is considered a safe choice to prevent pregnancy than abortion which is considered life threatening. The aim of this study was to assess knowledge, attitude, and practices (KAP) of community pharmacists towards emergency contraceptives and their association with sociodemographic variables. This study was a cross sectional study conducted between August and September 2021 on a convenient sample of community pharmacists from Iraq. The survey tool was an online, self-administered questionnaire, in English language and a paper-based copy of the questionnaire was delivered face-to-face to some of the study participants. The questionnaire consisted of four parts, sociodemographic characteristics, knowledge, attitude and practices of community pharmacists toward emergency contraceptives. A total of 212 community pharmacists participated in the study. Of the study participants, 67.9% were in the age range of (24-29) years, 61.8% were females, 60% had less than 5 years of experience, the majority (73.1%) were from Baghdad. This study showed that the majority of community pharmacists (74%) had good knowledge and 95% of them had a very positive attitude. However, 51% of the participants had poor practice where 62.5% of the pharmacists did not make counselling during dispensing on mechanism of action. This study results have shown no significant relationship between demographic characteristics and KAP of participants towards emergency contraceptives. The majority of the study participants had good knowledge and very positive attitude too, whereas poor practice was observed in more than half of the participants. Educational programs and training sessions are required to raise knowledge about the importance of emergency contraceptives and also to improve the dispensing practice of these products.

**Keywords: Emergency contraceptives, Knowledge, Attitude, Practice, Community pharmacists.**

### معرفة و مواقف وممارسات صيادلة المجتمع في العراق نحو استخدام وسائل منع الحمل

الطائفة ( بحث مؤتمر ) #

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# المؤتمر العلمي العاشر لكلية الصيدلة، جامعة بغداد ٢ - ٣ حزيران ٢٠٢٢

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### الخلاصة

موانع الحمل الطارئة تستخدم لمنع فرصة الحمل غير المقصود الذي يتبع الجماع غير المحمي في حالات الاستعمال غير الصحيح لوسائل منع الحمل الاعتيادية و الاعتداء الجنسي. يعتبر منع الحمل خيارا امنا مقارنة بالإجهاض الذي يعتبر خطرا على الحياة. كانت أهداف هذه الدراسة هي تقييم معرفة و مواقف و ممارسات صيادلة المجتمع تجاه موانع الحمل الطارئة و علاقتها مع المتغيرات الديموغرافية الاجتماعية. كانت هذه الدراسة عبارة عن دراسة استقصائية مقطعية أجريت في الفترة من آب الى ايلول عام ٢٠٢١ على عينة ملائمة من صيادلة المجتمع من العراق. كانت أداة المسح عبارة عن استبيان الكتروني يدار ذاتيا باللغة الانكليزية و تم تسليم نسخة ورقية من الاستبيان وجها لوجه لبعض المشاركين في الدراسة. يتكون الاستبيان من أربعة أجزاء: الخصائص الاجتماعية الديموغرافية، و المعرفة، و المواقف، و ممارسة صيادلة المجتمع تجاه وسائل منع الحمل الطارئة. شارك في الدراسة ما مجموعه ٢١٢ صيدلي مجتمع، ٦٧,٩٪ في الفئة العمرية (٢٩-٢٤) سنة، ٦١,٨٪ إناث، ٦٠٪ من المشاركين لديهم خبرة أقل من ٥ سنوات، و الأغلبية (٧٣,١٪) من بغداد. أظهرت هذه الدراسة أن غالبية صيادلة المجتمع (٧٤٪) لديهم معرفة جيدة عن وسائل منع الحمل الطارئة و أن ٩٥٪ منهم لديهم مواقف جيدة جدا. و مع ذلك، فإن ٥١٪ من المشاركين كانت لديهم ممارسات ضعيفة حيث أن ٦٢,٥٪ لم يقدموا المشورة بشأن آلية عمل وسائل منع الحمل. بالإضافة لذلك، أظهرت نتائج هذه الدراسة عدم وجود علاقة ذات دلالة أحصائية بين الخصائص الديموغرافية و المعرفة و المواقف و الممارسات تجاه وسائل منع الحمل الطارئة. كان لدى غالبية المشاركين معرفة و مواقف جيدين تجاه وسائل منع الحمل الطارئة، في حين لوحظت ممارسات تطبيقية ضعيفة في أكثر من نصف المشاركين. يقترح وضع برامج تعليمية ودورات تدريبية لرفع مستوى الوعي حول أهمية وسائل منع الحمل الطارئة وكذلك لتحسين ممارسة الصيادلة لصرف هذه المنتجات.

الكلمات المفتاحية: وسائل منع الحمل الطارئة، معرفة، مواقف، ممارسات، صيادلة المجتمع.

### Introduction

Emergency contraceptives (ECs) are indicated for preventing the chance of unintended pregnancy that follows unprotected sexual intercourse in cases of contraceptive failure and

sexual assault. The ECs are considered as a last choice since they cannot be used as a regular method of contraception and they cannot provide protection against sexually transmitted diseases (STDs)<sup>(1)</sup>.

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ECs do not terminate the pregnancy if it has already occurred. Also, they have no harmful effects neither on the fetus nor on the mother compared to methods used in abortion which have adverse effects like maternal death and infertility<sup>(2)</sup>. Unintended pregnancy and induced abortion can be a significant problem in the community, both from the health and economic point of view. A cross sectional study conducted on 500 pregnant women in Erbil/ Iraq has shown that about 39.4% of women had unintended pregnancy which was significantly higher in those aged  $\geq 35$  years and those with insufficient income<sup>(3)</sup>. Another study carried out in Mosul/Iraq on 1302 married women showed that 13.5% of women tried to induce abortion by physical activity, herbal remedies or pharmacological preparations<sup>(4)</sup>. This can impose a significant risk on the mother's health. The same study had shown that induced abortion was significantly higher in women with unemployed husbands, those who were housewives and those who were not using contraceptives<sup>(4)</sup>. Therefore, the use of ECs can reduce both the health and economic consequences of unintended pregnancy and subsequent induced abortion.

There are four types of ECs which vary in their mechanisms of action and efficacy. Available types of ECs include emergency hormonal contraceptives (EHC) pills, also known as morning after pill, which include two major types: ulipristal acetate (Ella)<sup>®</sup> and levonorgestrel (plan B)<sup>®</sup>. In addition, many types of combined oral contraceptives (COC) that contain progesterone and ethynyl estradiol can be used as ECs. Other non-hormonal ECs include copper intrauterine device (IUD). Ulipristal acetate (Ella)<sup>®</sup>, a progesterone receptor modulator, acts by delaying or preventing the ovulation process. It is effective until five days (120 hours) of unprotected sexual intercourse, however, as a general principle for all types of EC, it is best to be given as soon as possible<sup>(5)</sup>. The possible side effects of ulipristal acetate include abdominal pain, headache, dizziness, nausea, vomiting and dysmenorrhea. Other less common side effects include bloating and uterine cramping<sup>(6)</sup>. Levonorgestrel is a progesterone only tablets. It should be taken within 72 hours after unprotected intercourse<sup>(7)</sup>. The mechanism of action of levonorgestrel is inhibiting or delaying the ovulation process by inhibiting rupture of follicle and release of ova that prevents fertilization and pregnancy<sup>(8)</sup>. The possible side effects related to levonorgestrel include heavy or light menstruation, nausea, vomiting, abdominal pain, most women show their cycle within few days with expected date<sup>(9)</sup>. Combined Oral Contraceptives containing an estrogen and a progestin can also be used for emergency contraception in method called Yuzpe regimen. It should be taken within three days (72 hours) after unprotected sexual intercourse<sup>(8)</sup>. The mechanism of action of COCs as ECs is by

inhibiting implantation of a fertilized egg, delaying or suppressing ovulation, interfering with corpus luteum function and making changes in the endometrium that prevents implantation<sup>(8)</sup>. The possible related side effects of COCs include nausea, vomiting in higher proportion than ulipristal or levonorgestrel, headache and abdominal cramping<sup>(8)</sup>. Copper Intrauterine Device (IUD) is the most effective method of EC. It is used within five days of unprotected intercourse. Although copper IUD has high efficacy, many studies showed that it had low recommendation from physician related to its practice and the presence of oral emergency contraceptives<sup>(10)</sup>. The mechanism of action of copper IUD involves releasing copper ion from this device which can have toxic effects on both sperm and ova, so preventing fertilization and preventing implantation if fertilization has occurred. The possible related side effects of IUD include uterine cramping, dysmenorrhea and increasing duration of menstruation<sup>(7)</sup>.

The role of the pharmacists is very important in dispensing EC. This involves providing consultation about the use and side effects and answering related questions on EC use. Different studies were conducted to assess knowledge, attitude and practice of pharmacists toward EC. A study conducted in Kathmandu/Nepal on a sample of community pharmacists has shown that about 65% of participant pharmacists had good knowledge, about 93% of them had positive attitude and 75% of them good practice in dispensing ECs<sup>(11)</sup>. In Ethiopia, a study conducted on pharmacy professionals found that overall participants had very good knowledge, attitude and dispensing practice regarding ECs<sup>(12)</sup>. In Iraq, knowledge about ECs was investigated among primary healthcare doctors (obstetrics and gynecology specialists, general practitioners and family physicians) in Baghdad. The results showed that there was a defect in primary healthcare physicians' knowledge which led to EC underuse<sup>(13)</sup>. In addition, knowledge, attitude, and practice about EC among women in primary healthcare centers was investigated in Baghdad. The study has shown that participants had little knowledge about ECs and that only 12% of them used EC to prevent unwanted pregnancy<sup>(14)</sup>. To our knowledge, there is no study conducted in Iraq that has evaluated the level of knowledge, attitude and dispensing practices of ECs among community pharmacists.

The aim of this study was to assess knowledge, attitude, and practices of community pharmacists towards emergency contraceptives and their association with sociodemographic variables.

## Subjects and Methods

The current study was approved by the Ethical and Scientific Committee at College of Pharmacy/University of Baghdad. The pharmacists were informed of the research objectives and confidentiality of their responses.

This was a cross sectional study conducted between August and September 2021. The inclusion criteria were pharmacists of both genders who were working in community pharmacies and consented to participate in this study. Community pharmacists who were excluded from this study were those who did not consent to participate in the study and those who provided incomplete responses.

The survey tool was an online self-administered questionnaire in Google form distributed through medical groups on social media, in English language, that was used to collect study data from eligible participants. In addition, a paper-based copy of the questionnaire was delivered face-to-face to some of the study participants due to limited time of study and also small sample size who responded to the online questionnaire. The questionnaire was adopted from a previous study with some modifications that were made according to the local practice<sup>(11)</sup>. The questionnaire consisted of four sections. The first section included sociodemographic questions, whereas the other three sections included questions about knowledge, attitude, and practices; respectively. The questionnaire was first pretested on ten community pharmacists to ensure the clarity of the questions. Then it was distributed to other community pharmacists.

The statistical analyses were performed using Microsoft Excel (2010) and Statistical Package for Social sciences (SPSS) version 15 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to summarize the characteristics of the study population. The categorical variables were expressed as frequencies and percentages. For the assessment of knowledge and practice scores, each correct response was given a score of one, whereas each incorrect response was given a score

of zero. Then the cumulative and mean scores were calculated. Participants whose scores above the mean score were considered to have good knowledge and good practice, whereas those who had scores below mean score were considered to have poor knowledge and poor practice<sup>(11)</sup>. The attitude of participants was calculated using five-point Likert scale ranging from strongly agree with a score of 5, to strongly disagree with a score of 1, while a reverse scoring was used in questions one, three and six. Then, both of the cumulative and median score were calculated. Those participants who had scores equal and above median score were considered to have positive attitude while those who had scores below the median score were considered to have negative attitude<sup>(11)</sup>. The data was not normally distributed. Therefore, for the detection of the relationship between sociodemographic variables and the participant knowledge level and practice level, Chi-square and Fischer Exact tests were used where relevant. Additionally, for the assessment of the relationship between the attitude level and the sociodemographic variables Mann - Whitney U and Kruskal-Wallis H tests were used where relevant. A P- value of less than 0.05 was considered to be significant.

## Results

### *Sociodemographic characteristics of the study population*

A total of 217 responses were received from the participants. Five responses were excluded because of incomplete answers and 212 responses were included in the final analysis. There were 162 online and 50 paper-based responses received from the study participants. Table (1) presents the sociodemographic characteristics of community pharmacists who participated in the study. Most of the participants (67.9%) were in the age group (24-29), were females (61.8%), had bachelor degree (79.2%), had less than 5 years of experience (60.8%) and were from Baghdad (73.1%). Most of the participants (83%) had another work in addition to the community pharmacy from whom 48.1% were working in a hospital.

**Table 1. Sociodemographic characteristics of the study participants.**

Characteristic	Percentage distribution of respondents, Number (%)
Age (years)	
24-29	144 (67.9%)
30-35	40 (18.9%)
36-41	16 (7.5%)
42>	12 (5.7%)

Continued table 1

Characteristic	Percentage distribution of respondents, Number (%)
Gender	
Male	79 (37.3%)
Female	131 (61.8%)
Missing	2 (0.9%)
Degree of education	
Bachelor	168 (79.2%)
Diploma	8 (3.8%)
Master	27 (12.7%)
PhD	9 (4.2%)
Years of Experience:	
<5	129 (60.8%)
5-10	48 (22.6%)
>10	35(16.5%)
Governorate in which pharmacy is located	
Baghdad	155(73.1%)
Babil	10(4.7%)
karbala	9(4.2%)
Others <sup>a</sup>	38(17.9%)
Do you have additional work?	
Yes	176 (83.0%)
No	36 (17.0%)
if yes please specify:	
Hospital	102 (48.1%)
Hospital, medical representer	2 (0.9%)
Primary health care center	26 (12.3%)
Academia	24 (11.3%)
Others <sup>b</sup>	18 (8.5)
missing	4 (1.8)
Location of the pharmacy	
Near the hospital	24 (11.3)
Near gynecology clinic	37 (17.5)
None of them	151 (71.2)

<sup>a</sup> : Al-Anbar, AL-Najaf, Al-Qadisiya, Basra, Dhi Qar, Diyala, Erbil, , Kirkuk, Maysan, Nineveh, Saladin, Sulaimaniya, Wasit.

<sup>b</sup> : medical representer, supervisor.

#### **Knowledge of the community Pharmacists towards Emergency contraceptives**

Table (2) shows the participants responses about knowledge questions. Regarding the mechanism of action of ECs, 59.4% of the participants stated that ECs act by preventing or delaying ovulation. Only 39.6% of the community pharmacists indicated that they received information about ECs more than once, with about half of those who received information (51.8%) stated that they received it from undergraduate/postgraduate study.

In contrast, 22.6% of them indicated that they did not receive any information in previous years. More than one-third of the participants (37.7%) indicated that levonorgestrel should be taken within 72 hours, and more than half of them (56.6%) stated that levonorgestrel is the major ECs constituent. Only 48.6% of all participants showed that EC have no harmful effects on fetus development. Most of the participants (83.9%) stated that condom leak was the main cause of ECs use. The majority of the study participants (90.9%) indicated that ECs do not

protect from sexually transmitted diseases (STDs). The most commonly reported side effects of ECs were nausea and vomiting (Figure 1).

Regarding the knowledge level of the community pharmacists, results showed that the

mean knowledge score was 0.55 and that about 74% of the participants had good knowledge, while 26% had poor knowledge (Figure 2).

**Table 2. Knowledge of community pharmacists towards emergency contraceptives**

Knowledge questions	Number (%)
Mechanism of action of ECs:	
Prevent or Delay Ovulation (release of ovum from an ovary)	126 (59.4%)
Induce Abortion	9 (4.24%)
Prevent an already established pregnancy	73 (34.4%)
Don't Know	15 (7.07%)
How many times in the past years have you received information about ECs?	
Yes, once	80 (37.7%)
Yes, more than once	84 (39.6%)
No	48 (22.6%)
Sources of information:	
Undergraduate/postgraduate study	110 (51.8%)
Medical Representative	16 (17.5%)
Textbook	47 (22.1%)
Training	39 (18.3%)
Internet	212 (38.2%)
Within how many hours after unprotected sexual intercourse should the levonorgestrel pills be taken?	
120	9 (4.2%)
72	80 (37.7%)
48	22 (10.3%)
24	36 (16.9%)
Don't know	14 (6.6%)
Mention the constituents of ECs.	
Levonorgestrel	120 (56.6%)
Levonorgestrel plus Ethinyl Estradiol	17 (8.01%)
Copper IUD	22(10.3%)
Don't Know	5 (2.3%)
ECs can harm a developing fetus	
Yes	58 (27.4%)
No	103 (48.6%)
Don't Know	51 (24.0%)
Situations where ECs can be used	
Missed Injection due date and had unprotected sex	140 (66.3%)
Condom leaked/slipped	178 (83.9%)
Victims of sexual assault	172 (81.1%)
Intercourse without any family planning method	143 (67.4%)
Don't Know	16 (7.5%)
Do you know the side effects of ECs?	
Yes	92 (43.3%)
No	89 (41.9%)
Not sure	31 (14.6%)
Does EC protect from Sexually Transmitted Infections (STI)?	
Yes	6 (2.83%)
No	191 (90.09%)
Don't know	15 (7.07%)

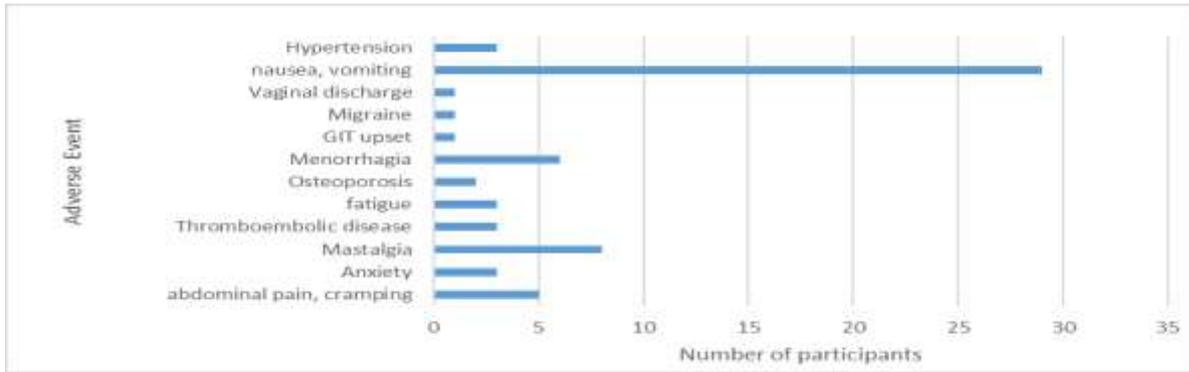


Figure 1. Community pharmacists' responses on side effects.

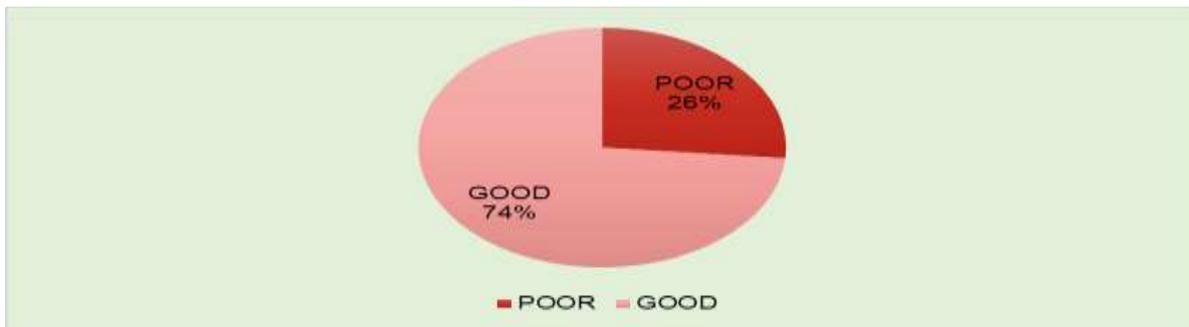


Figure 2. The knowledge level of the study participants.

**Relationship between sociodemographic characteristics and the knowledge level of the community Pharmacists**

Results of the current study showed that none of the sociodemographic characteristic of the

participants had a significant effect on the knowledge level ( $p > 0.05$ ) (Table 3). However, a higher knowledge level was found in the age group of (30-35) (82.5%), those with master degree (81.5%), and those with 5-10 years of experience (79.2%).

Table 3. Association between sociodemographic characteristics and community pharmacists' knowledge level.

Variables	Good knowledge N(%)	Poor knowledge N (%)	P value
Age			
24-29	104 (72.2%)	40 (27.8%)	<sup>a</sup> 0.144
30-35	33 (82.5%)	7 (17.5%)	
36-41	13 (81.3%)	3 (18.8%)	
42>	6 (50%)	6 (50%)	
Gender			
Male	58 (73.4%)	21 (26.6%)	<sup>b</sup> 0.983
Female	96 (73.3%)	35 (26.7%)	
Degree of education			
Bachelor	123 (73.2%)	45 (26.8%)	<sup>a</sup> 0.485
Diploma	6 (75.0%)	2 (25.0%)	
Master	22 (81.5%)	5 (18.5%)	
PHD	5 (55.6%)	4 (44.4%)	
Years of experience			
<5	93 (72.1%)	36 (27.9%)	<sup>a</sup> 0.174
5-10	38 (79.2%)	10 (20.8%)	
>10	25 (71.4%)	10 (28.6%)	
Location of the pharmacy			
Near the hospital	14 (58.3%)	10 (41.7%)	<sup>a</sup> 0.174
Near gynecology clinic	29 (28.4%)	8 (21.6%)	
None of them	113(74.8%)	38 (25.2%)	

a: Fishers Exact test

b: Chi-square test

**Attitude of the community pharmacists toward emergency contraceptives**

Table (4) shows the attitude of the community pharmacists towards ECs. Results showed that 46% of participants expressed their disagreement on giving easy access for teenagers in using ECs, and 50.7% showed their agreement that adolescents should be discouraged to use ECs. Also, 78.9% showed their agreement that routine

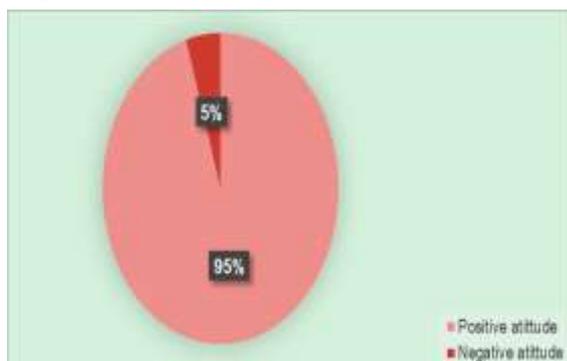
information on ECs should be included in the ECs counselling, and 31% of participants agreed that they were uncomfortable with ECs dispensing for moral or religious reasons. In addition, 76.1% showed their agreement on the importance of formal training in enabling pharmacists to appropriately dispense ECs and 55.4% agreed that ECs without prescription will promote unsafe sexual intercourse.

**Table 4. Attitude of community pharmacists towards emergency contraceptives.**

Attitude questions	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)
Adolescents (Teenagers) should be given an easy access to ECs. *	45 (21.1)	53 (24.9)	42 (19.7)	51(23.9)	20 (9.4)
Adolescents (Teenagers) should be discouraged to use ECs.	14 (6.6)	45 (21.1)	45 (21.1)	68 (31.9)	40 (18.8)
ECs can be used as a regular oral routine contraceptive method.	73 (34.3)	78 (36.6)	21 (9.9)	28 (13.1)	12 (5.6)
ECs discourage regular contraceptive method use among youth.	16 (7.5)	49 (23.0)	56 (26.3)	73 (34.3)	17 (8.0)
Routine information about ECs should be included in contraceptive counseling.	5 (2.3)	7 (3.3)	32 (15.0)	103(48.4)	65 (30.5)
Are you uncomfortable dispensing ECs for moral or religious reason? *	29 (13.6)	42 (19.7)	75 (35.2)	50 (23.5)	16 (7.5)
Formal training is needed to enable the dispensers to appropriately dispense ECs.	2 (.9)	12 (5.6)	36 (16.9)	89 (41.8)	73 (34.3)
ECs without prescription will promote unsafe sexual intercourse.	13 (6.1)	30 (14.1)	51 (23.9)	71 (33.3)	47 (22.1)

\*Reverse scoring was adopted.

Results of the participants' attitude showed that about 95% of them to have positive attitude, while only 5% of them to have negative attitude (Figure 3).



**Figure 3. Attitude of community pharmacists toward ECs.**

**Relationship between sociodemographic characteristics and attitude level.**

In the current study, none of the sociodemographic characteristics of the study population was found to have a significant relation with attitude (Table 5). However, a higher positive attitude was found in participants aged more than 42 years (83.3%), female pharmacists (79.4%), those with PhD and Bachelor qualification (77.8%) and (77.4%) respectively, those who have more than 10 years of experience (82.9%), and where the location of their pharmacies being near a hospital (83.3%).

**Table 5. Association between sociodemographic characteristics and community pharmacists' attitude level.**

Variables	Positive Attitude	Negative Attitude	P value
Age			
24-29	136 (94.4%)	8 (5.6%)	<sup>a</sup> 0.7
30-34	38 (95.0%)	2 (5.0%)	
35-41	16 (100.0%)	0 (0.0%)	
42>	12 (100.0%)	0 (0.0%)	
Gender			
Male	73 (92.4%)	6 (7.6%)	<sup>b</sup> 0.5
Female	128 (97.7%)	3 (2.3%)	
Degree of education			
Bachelor	160 (95.2%)	8 (4.8%)	<sup>b</sup> 0.1
Diploma	7 (87.5%)	1 (12.5%)	
Master	26 (96.3%)	1 (3.7%)	
PhD	9 (100%)	0 (0.0%)	
Years of experience			
<5	125 (96.9%)	4 (3.1%)	<sup>a</sup> 0.2
5-10	43 (89.6%)	5 (10/4%)	
>10	34 (97.1%)	1 (2.9%)	
Location of the pharmacy			
Near the hospital	23 (95.8%)	1 (4.2%)	<sup>a</sup> 0.07
Near gynecology clinic	36 (97.3%)	1 (2.7%)	
None of them	143 (94.7%)	8 (5.3%)	

**a:** Kruskal-Wallis H test

**b:** Mann-Whitney U test

#### **Practice of community Pharmacists toward ECs**

Table (6) shows the responses of participants towards the practice of ECs. Most of the participants (79.2%) stated that they have dispensed ECs in their pharmacy. More than half of them (56.1%) thought that ECs should not be categorized as OTC drugs whereas 43.3% stated that they should be. For the participants who dispensed, 71.4% of them indicated that levonorgestrel (I- pill) ® tablet was the most sold brand of ECs. In addition, 90.4% of the community pharmacists indicated that dispensing ECs was upon their recommendation and

75% of them stated that they have provided ECs for girls under 18 years old.

Regarding counseling about ECs 70.2% of the pharmacists stated that they counsel all ECs users while dispensing, whereas 62.5% of them indicated that they do not make counselling on ECs mechanism of action. Also, 86.9% of the pharmacists indicated that they make counselling on the time ECs should be taken, on other hand, about 61.3% of the pharmacists stated that they provide counselling about ECs side effects.

**Table 6. The practice of the community pharmacist toward EC**

Practice questions	Percentage distribution of respondents, Number (%)
Have you ever dispensed Emergency Contraceptives?	
Yes	168 (79.2%)
No	44 (20.7%)
Do you feel ECs should be categorized under Over the Counter (OTC) drug?	
Yes	92 (43.4%)
No	119 (56.1%)
Don't know	1 (0.47%)
Which brand of ECs is sold the most?	
Levonorgestrel (I pill)	120 (71.4%)
Ulipristal (Ella One)	17 (10.11)
Combination oral contraceptives	29 (17.2%)

Continued table 6.

Practice questions	Percentage distribution of respondents, Number (%)
Intrauterine device (IUD)	5 (2.9%)
Most often the products are sold on:	
Patient request	2 (1.1%)
Patient approaches with prescription	79 (47.02%)
On your recommendations	152 (90.4%)
To whom you have provided ECs:	
Girls aged under 18 years	126 (75%)
Victims of sexual assault	15 (8.9%)
Women whose partner's barrier contraception method fail	5 (2.9%)
Women who did not use any contraception method	70 (41.6%)
Do you counsel all ECs users while dispensing?	
Yes	118 (70.2%)
No	50 (29.8%)
Do you counsel on mechanism of action of ECs?	
Yes	63(37.5%)
No	105 (62.5%)
Do you counsel the time at which the ECs should be taken?	
Yes	146 (86.9%)
No	22 (13.09%)
Do you conceal side effect of EC?	
Yes	103(61.3%)
No	65(38.7%)

Figure (4) shows the practice level of the community pharmacists based on their responses. The mean practice score was 0.6, and 82 (48.8%) of the participants were found to have good practice while 86 (51.1%) of them were found to have poor practice.

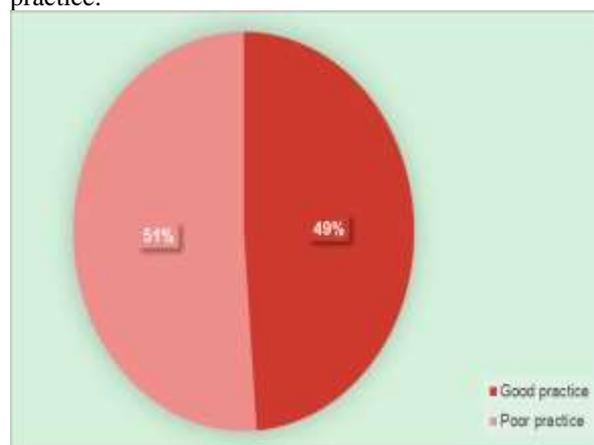


Figure 4. The community pharmacists' practice level

#### Association between sociodemographic characteristics and practice level

Table (7) shows the results of the relationship between sociodemographic characteristics of the study population and the practice level. No significant relationship was found between any of the sociodemographic and practice level of the participants. However, a good practice was found within the age group (24-29) (51.4%), participants with Diploma degree (83.3%), those with 5-10 years of experience (57.6%), and those who had location of the pharmacies near hospital (58.8%).

Table 7. Association between sociodemographic characteristics and community pharmacists' practice level.

Variables	Good practice	Poor practice	P value
Age			<sup>a</sup> 0.4
24-29	56 (51.4%)	53 (48.6%)	
30-35	17 (50.0%)	17 (50.0%)	
36-41	6 (37.5%)	10 (62.5%)	
≥42	2 (25.0%)	6 (75.0%)	

Continued table 7.

Variables	Good practice	Poor practice	P value
Gender			
Male	30 (44.8%)	37 (55.2%)	<sup>a</sup> 0.4
Female	47 (48.0%)	47 (48.0%)	
Degree of educating			
Bachelor	62 (48.8%)	65 (51.2%)	<sup>b</sup> 0.3
Diploma	5 (83.3%)	1 (16.7%)	
Master	11 (42.3%)	15 (57.7%)	
PHD	3(37.5%)	5 (62.5%)	
Years of experience			
<5	47 (48.0%)	51 (52.0%)	<sup>a</sup> 0.3
5-10	20 (57.6%)	18 (47.4%)	
>10	14 (45.2%)	17 (54.8%)	
Location of the pharmacy			
Near hospital	10 (58.8%)	7 (41.2%)	<sup>a</sup> 0.3
Near gynecology clinic	10 (37.0%)	17 (63.0%)	
None of them	61 (49.6%)	62 (50.4%)	

**a:** Chi-square test

**b:** Fishers Exact test

## Discussion

Community pharmacists play an essential role in dispensing of ECs. In addition, looking at the significant numbers of unintended pregnancies and induced abortions reported in Iraq<sup>(3)</sup>, it has become very imperative to conduct a study to evaluate the knowledge, attitude and dispensing practice of community pharmacists towards these medications. The results of this study have shown that 74% of community pharmacists had good knowledge about ECs. Other studies have shown that pharmacists had very good knowledge<sup>(12)</sup> or had good knowledge<sup>(11)</sup> about ECs. In comparison, another study has shown a low level of the knowledge among community pharmacists<sup>(15)</sup>.

Having good knowledge could be attributed to receiving information about ECs from various sources. This was shown in the results of this study where the majority of participants indicated that they had received information about ECs, with about half of them had received the information during their undergraduate/postgraduate studies. This reinforces the important role of the undergraduate/postgraduate curriculum to provide essential information to pharmacists. The overall good knowledge level obtained in this study came from the participants' responses. The majority of participants provided correct responses about the major ECs constituents, situations where ECs can be used and whether ECs can protect from STDs. However, a fewer number of participants have provided correct information about the mechanism of action of ECs, the time within which ECs should be used after sexual intercourse, whether ECs can harm a developing fetus, and side effects of ECs. Additionally, some participants gave inaccurate side effects of ECs. This may be related to receiving information from internet (38.2%) which may be inaccurate or not receiving any

information about ECs (22.6%). Possessing correct information about ECs, particularly that regarding the mechanism of action, timing of use and side effects is very essential for the community pharmacists to enable them to properly dispense these medications. For example, giving inaccurate information about the side effects of ECs may result in fear of women from using these products and using other risky ways to terminate pregnancy.

The current study's results had shown that there was no significant relationship between sociodemographic characteristics of the community pharmacists and knowledge score. However, a higher knowledge level was observed in the age group of (30-35) and those with 5-10 years of experience. This may implicate that as pharmacists had more years of work, they gain more experience and knowledge about ECs. This came in agreement with a study conducted in Iran which found non-significant association between pharmacists' knowledge and their demographic variables<sup>(15)</sup>. On the other hand, the study of Ethiopia found a positive relationship between knowledge and years of practice<sup>(12)</sup>. Also, in Nepal study pharmacists' age had a significant effect on level of knowledge<sup>(11)</sup>.

Regarding the attitude of community pharmacists towards ECs, this study's results have shown that 95% of participants had very positive attitude towards ECs. Similarly, the studies conducted in Turkey and Ethiopia have shown that pharmacists had positive attitudes towards ECs<sup>(12,16)</sup>. In addition, the study done in Nepal showed that high percentage of pharmacists (93.4%) had positive attitude towards ECs<sup>(11)</sup>. This level of positive attitude may have come from the responses obtained from the participants. Half of the study participants (50.7%) agreed that adolescents should be

discouraged from using ECs, and about half (46%) of them expressed their disagreement in giving an easy access for teenagers in using ECs as this may decrease the use of regular contraceptive methods among youth (42.3%), also may encourage some teenagers on illegal relationships. Attitudes about the use of ECs by adolescents and youngest people may be subject to cultural backgrounds. The study of Nepal has shown that 48.9% of participants disagreed that adolescents should have an easy access to ECs<sup>(11)</sup> whereas studies of Turkey and Ethiopia have shown that 40% and 63.3% of participants, respectively, thought that teenagers and youngest people can take responsibility of using ECs<sup>(12,17)</sup>.

Another positive attitude was shown when the majority of the participants indicated the importance of including routine information on ECs during counselling and felt that formal training is important to enable pharmacists to appropriately dispense ECs. Besides, more than half of the participants believed that dispensing ECs without prescription will promote unsafe sexual intercourse. Therefore, 56.1% of them felt that ECs should not be categorized under over-the-counter drugs.

The current study's results showed non-significant relationship between sociodemographic characteristics and attitude score. That coincides with Nepal study where the relationship between sociodemographic characteristics and attitude score was non-significant<sup>(11)</sup>.

Regarding the dispensing practice of community pharmacists towards ECs, the current study's results have shown that only 48.8% of the participants had good practice. These findings contradict the results that showed that most of the study participants had good knowledge and very positive attitude. Having good knowledge and attitude does not necessarily mean applying it in practice. This could be due to the finding that some participants did not dispense ECs in their pharmacies or the dispensing was improper as will be discussed later. Similar findings were obtained from a study conducted in United Arab Emirates where the dispensing practice of ECs was rated as suboptimal<sup>(18)</sup>, and the Turkish study which concluded that some aspects of the dispensing practice of ECs needs to be improved<sup>(17)</sup>. However, in Nepal study, 74.9% of pharmacists had good practice<sup>(11)</sup> and in Ethiopia study, the practice level was described to be very good<sup>(12)</sup>.

In the current study, only 79.2% of the participants indicated that they had dispensed ECs which may indicate underuse of ECs in our community. This was shown in a study conducted in Baghdad/Iraq where only 12% of women used ECs to prevent unwanted pregnancy<sup>(3)</sup>. In the current study, dispensing of ECs was mostly based on the pharmacists' recommendations. This may reflect the level of knowledge of customers who request ECs,

where it has been shown that women had limited information about ECs in the study done in Baghdad<sup>(14)</sup>. An interesting finding in the current study where more than half of the participants stated that they have provided ECs to girls under 18 years old, which was contradicting to their attitude where about half of them disagreed that adolescents should have easy access to ECs.

Regarding counseling during dispensing, only 70.2% of the participants indicated that they counsel all EC users while dispensing. This is comparable to the finding that 79% of the participants thought that providing information on ECs during counselling is essential. Counselling was mostly about the time of taking ECs, and the ECs' side effects, with only a minority of participants who counselled about the mechanism of action of ECs. Counseling is a very essential role of the pharmacist and it enables women to make the right choice of which EC product to use and the proper way to use it. Providing inadequate counseling may be attributed to the lack of time due to the work load or lack of private areas in the pharmacies to discuss such sensitive issue. Similarly, only 58.2% of the pharmacists in the study done in United Arab Emirates provided spontaneous counseling about the use of ECs<sup>(18)</sup>. In contrast, the Nepal study has shown that 70% of the participants provided counseling to all EC users<sup>(11)</sup>. Additionally, 85% of the respondents in Ethiopia study stated that they counsel all women while dispensing ECs<sup>(12)</sup>.

This study's results showed that there was non-significant relationship between demographics variables and practice level. In comparison, the results of the Nepal study showed a significant association between age, years of experience and location of the pharmacy with the dispensing practice<sup>(11)</sup>. On the other hand, the Ethiopian study results showed that dispensing practice had positive relation of years of experience<sup>(12)</sup>.

The limitation of this study was the small sample size due to the short time of data collection.

## Conclusions

This study detected that community pharmacists in Iraq had good knowledge and positive attitude but poor practice especially about counselling about ECs during dispensing. Additionally, the sociodemographic variables had non-significant relationship with the knowledge, attitude and dispensing practice of ECs. Recommendations of the current study were:

1. Future educational programs are very important like regular training programs by the Pharmacists Syndicate.
2. Necessity of inserting the subject of ECs in the Continuing Education System in Ministry of Health to the pharmacists especially in general hospitals, and Primary Health Care Centers in which family planning department is present.

3. Necessity of educating the community education about the importance of ECs and their safe and effective use.

### Conflict of interest

Authors of the study declare no conflict of interest.

### References

1. Lewandowski CM, Co-investigator N. Emergency contraception: a last chance to prevent unintended pregnancy. *J Chem Inf Model.* 2013;53(18):1689–99.
2. Mittal S. Emergency contraception - Potential for women ' s health. *Int J Womens Health.* 2014;140:45–52.
3. Salih RK, Zangana J. A Cross sectional study about unintended pregnancy among women in Erbil, Kurdistan Region of Iraq. *J Med Chem Sci.* 2022;5(2):171–6.
4. Al-Ridhwany H, Aljawadi A, Abduljawad M. Use of induced abortion for birth control by mothers in Iraq. *East Mediterr Heal J.* 2018;24(7):644–52.
5. Rosato E, Farris M, Bastianelli C. Mechanism of action of ulipristal acetate for emergency contraception: A systematic review. *Front Pharmacol.* 2016; 6:315.
6. Jadav SP and Parmar DM. Ulipristal acetate, a progesterone receptor modulator for emergency contraception. *J Pharmacol Pharmacother .* 2012;3(2):109–11.
7. Haeger KO, Lamme J, Cleland K. State of emergency contraception in the U.S., 2018. *Contracept Reprod Med.* 2018;3(1):1–12.
8. Matyanga CMJ, Dzingirai B. Clinical pharmacology of hormonal emergency contraceptive pills. *Int J Reprod Med.* 2018;2018:1–5.
9. Li HWR. Emergency contraception. *Trends Androl Sex Med.* 2021;8(3):195–206.
10. Harper CC, Speidel JJ, Drey EA, Trussell J, Blum M, and Darney PD. Copper intrauterine device for emergency contraception. *Obstet Gynecol.* 2012;119(2):220–6.
11. Shakya S, Shrestha S, Shrestha RK, Giri U, Shrestha S. Knowledge, attitude and practice of emergency contraceptive pills among community pharmacy practitioners working in Kathmandu Valley: A cross-sectional study. *BMC Health Serv Res.* 2020;20(1):1–18.
12. Belachew SA, Yimenu DK, Gebresillassie BM. Pharmacy Professionals' Dispensing practice, knowledge, and attitude towards emergency contraceptives in Gondar Town, Northwestern Ethiopia: A Cross-Sectional Study. *Int J Reprod Med.* 2017;2017:1–9.
13. Tawfeeq WA, Abaas A, Abdulkareem ZA. Knowledge about emergency contraception pills among primary health care doctors in baghdad/al-karkh sector. *Indian J Forensic Med Toxicol.* 2020;14(2):321–6.
14. Anwar Alkhazrajy D. Knowledge, Attitudes& practice about emergency contraception among sample of women attending primary health care centers in Baghdad. *Eur J Biol Med Sci Res.* 2014;2(2):1–24.
15. Mostafavi SA, Sabzghabae AM, Mirmoghtadae P, Hoseini-Biuki SM. Emergency contraception and the knowledge of community pharmacists in Isfahan, Iran. *Int J Prev Med.* 2011;2(4):252–5.
16. Apikoglu-Rabus S, Clark PM IF. Turkish pharmacists' counseling practices and attitudes regarding emergency contraceptive pills. *clin pharm.* 2012;34(4):579-586.
17. Apikoglu-Rabus S, Sancar M, Okuyan B, Izzettin F V. Turkish pharmacy technicians' counseling practices and attitudes regarding emergency contraceptive pills. *African J Pharm Pharmacol.* 2011;5(1):60–6.
18. Mobark DM, Al-Tabakha MM, Hasan S. Assessing hormonal contraceptive dispensing and counseling provided by community pharmacists in the united arab emirates: A simulated patient study. *Pharm Pract (Granada).* 2019;17(2):8–14.



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