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Original Research

Pharmacy Students' Knowledge, Attitude, and Practice Regarding Emergency Contraception in Lebanon: A Cross-Sectional Study

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Abstract

Background: Emergency contraception (EC) is a critical intervention for preventing unintended pregnancies when used promptly after unprotected intercourse. Despite its accessibility, misconceptions and inadequate knowledge about EC among pharmacy students may hinder its effective use. **Objective:** The aim of this study is to assess the knowledge, attitudes, and practices of pharmacy students regarding emergency contraceptives and explore factors influencing their knowledge, perceptions, and behaviors towards emergency contraception. **Methods:** This is a cross-sectional study that was conducted between December 2023 and February 2024 at the School of Pharmacy, Lebanese International University. A structured and validated questionnaire was distributed to 366 pharmacy students in their third, fourth, fifth, and PharmD years. The survey was divided into four parts: demographics, knowledge, attitude, and practice. Bivariable and multivariable analysis were conducted to identify demographic factors significantly associated with knowledge about EC and attitudes towards EC. **Results:** The majority of participants were female (79.8%) with a median age of 22 years. Knowledge about EC was inadequate. Fifth-year and PharmD students, as well as those working in community pharmacies, exhibited significantly higher knowledge scores. Attitudes towards non-prescription EC were predominantly negative. Religious affiliation strongly influenced attitudes, with students without religious ties showing more favorable perceptions. Among students working in pharmacies, only 58.3% reported readiness to dispense EC, citing moral and knowledge-related barriers. **Conclusion:** Pharmacy students in Lebanon showed inadequate knowledge and largely negative attitudes towards EC, underscoring the need for educational interventions in pharmacy curricula to address misconceptions about EC among pharmacy students and improve their readiness to counsel and dispense EC in their respective communities.

Keywords: Emergency Contraception, Education, Pharmacy, Students, Knowledge, Attitude, Practice

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INTRODUCTION

Among the contraception methods, Emergency contraception (EC) is a critical intervention adopted to reduce the risk of unintended pregnancy when used within a specific timeframe following unprotected sexual intercourse[1]. This method is primarily utilized after the failure of regular contraception or unplanned intercourse meeting fertility window[2]. According to World Health Organization (WHO), EC can prevent up to over 95% of pregnancies when taken within 5 days after intercourse[3]. Moreover, EC has proven to be an effective option irrespective of age or weight, with a high safety margin and has significantly reduced maternal sequelae of induced abortion[4,5]. EC includes hormonal pills such as levonorgestrel (LNG) available over the counter (OTC) or Ulipristal (ULP) dispensed by a prescription only, and copper intrauterine device (IUCD)[6,7]. Each type of EC carries its own dosage characteristics, considerations, and time frame of effectiveness. For examples, LNG is effective within 72 hours post-coital activity, while ULP is approved to be beneficial within 120 hours[8]. Remarkably, none of the methods can terminate an already formed pregnancy[9].

Despite accessibility and routine recommendation of EC by health care professionals, there remains a need to educate both community pharmacists and patients regarding dosing, safety, efficacy, and effectiveness[10]. This is mainly essential for young females and university students due to the lack of appropriate information regarding EC requirements and considerations, which in turn is exposing them to dangerous methods in order

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to cease pregnancy[11]. Several studies have highlighted the significant impact of induced abortions on health, financial stability, and humanistic satisfactions, identifying these as critical challenges that need to be addressed[12–14]. Furthermore, research has emphasized the essential role of pharmacists in educating patients about emergency contraception (EC), including its appropriate use, time-sensitive efficacy, key considerations, and potential side effects[15].

Since 2019, Lebanon has faced a financial bankruptcy forcing many pharmacy students to work as pharmacy assistants or technicians in order to afford their university expenses[16]. Moreover, pharmacy students are actively engaged in improving public education towards EC utilization during their academic years by conducting awareness campaigns, or by dispensing the treatment during their working hours[15,17]. Several Studies have demonstrated that the academic years, assignments, workshops, and reviewing literature have positively influenced the pharmacy students' knowledge about EC, which successively optimized patient's health outcomes[11,18].

Several Factors actually influence the use of EC by patients and the recommendations by health care professionals like the religious considerations, sociodemographic levels, and cultural affiliations[17]. which also affected the pharmacy students' knowledge about EC[19,20]. These fluctuating parameters have affected student's attitude and practice in counseling and dispensing as well[21]. For example, the misconception about EC that it can terminate an existed pregnancy, accordingly recognize it as a religiously forbidden intervention[20,22]. Noteworthy, first two years pharmacy students have major gaps regarding EC mechanism and duration of action thinking that it works same as regular contraceptives[23]. Conservative patients have worried about bad reputation and societal judgement whenever thinking about EC as a choice[24]. All these factors together along with governmental regulations in many countries have led to public demanding and disability in limiting incidence of unwanted pregnancy[25].

This study is conducted to evaluate the knowledge, attitude, and practice of pharmacy students in Lebanese retail pharmacies concerning emergency contraceptives. This study also aims to highlight on the factors that improve students' perceptions and believes, along with the factors that may alter students' practice of recommending or discouraging the use of EC.

METHODS

Study Design, Population and Setting

This cross-sectional study was conducted over a three-month period, between December 2023 and February 2024, at the School of Pharmacy at the Lebanese International University (LIU). The ACEP-accredited Bachelor of Pharmacy degree at LIU is a five-year program (2 pre-pharmacy years and 3 professional pharmacy years) followed by one elective PharmD year for selected students (around 30 PharmD students each year).

Google Forms, a survey administration software, was used to create a self-administered online questionnaire that was disseminated by an LIU official email to third, fourth, fifth and sixth year (PharmD) pharmacy students. To ensure similar response rate across different academic years, researchers chose one course from each academic year, and then shared the questionnaire with the students enrolled in these courses. The total number of participants was 366 students.

Questionnaire

A validated questionnaire was adapted from a previous study done in 2009 at the UAMS (University of Arkansas for Medical Sciences) College of Pharmacy[26]. Authors' permission to use and adapt the questionnaire was obtained. The questionnaire was adapted to fit the Lebanese market (EC brand names) and Lebanese laws and regulations for dispensing EC, and to reflect the updates in emergency contraception pharmacotherapy (ulipristal acetate was not approved for EC by the FDA until 2010). The questionnaire was then pre-tested and assessed by multiple researchers to verify content clarity and establish content validity.

The questionnaire included MCQs, True and False questions, and a 5-points Likert scale to assess students' attitudes (1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree). The questionnaire comprised 4 parts and was estimated to take 10 minutes to complete. The first part consisted of questions related to the demographic characteristics of the participants including age, gender, marital status, nationality (Lebanese/Non-Lebanese), religious affiliation, and academic year. The second part included questions that assessed students' knowledge about EC such as methods or types of EC, timing of EC, mode of action, brand names available in the Lebanese market, and Lebanese laws and regulations for dispensing EC in a community setting. The third part assessed students' attitudes and beliefs towards emergency contraception by using a 5-ponits Likert scale as previously mentioned. Students were asked about their level of agreement on the availability of EC for non-prescription use with and without pharmacist counselling, whether the non-prescription use of EC promotes unsafe sex and discourage regular contraception use, if they are uncomfortable dispensing EC for moral or religious reasons, and whether they feel competent to counsel about EC. The Likert scale average score for each attitude statement was then calculated to reflect the general attitude of pharmacy students towards each statement. The last part was only filled by pharmacy students who work in a community pharmacy to assess their behaviors and experience with dispensing EC.

Measured Outcomes

The study aimed to assess the knowledge of pharmacy students in Lebanon about emergency contraception. The study also explored the attitudes and behaviors of pharmacy students towards emergency contraception. In addition, the study examined the influence of certain demographic characteristics on knowledge, attitudes, and behaviors towards emergency contraception.

Ethical Considerations

The Ethics and Research Committee of the School of Pharmacy

at the Lebanese International University reviewed and approved the study protocol (Protocol number: 2024ERC-051-LIUSOP). The survey was anonymous and didn't collect any personal identifiers, such as name or email addresses, that could identify participants and breach the privacy or confidentiality of the students. Participants were able to respond to the survey only after providing their informed consent.

Statistical Analysis

Data were analyzed using IBM SPSS version 27. Descriptive data were analyzed by their mean and standard deviation (SD), or median and interquartile range (IQR) for continuous variables, and frequencies and percentages for categorical variables. The bivariate analysis for factors associated with knowledge about EC and attitudes towards non-prescription EC among pharmacy students utilized independent sample T-test and one way ANOVA. Thereafter, a multivariable logistic regression model was performed and included variables with P-value less than 0.2 in the bivariate analysis as independent variables and knowledge about EC as the dependent variable. Results were reported as adjusted odds ratio (ORa) with 95% confidence interval (95% CI). The level of significance was set at P-value less than 0.05 with an acceptable margin of error = 5%.

RESULTS

Characteristics of the study population

This study included 366 pharmacy students from the Lebanese International University in Lebanon. The majority of study participants were females (79.8%), with a median age of 22 years (interquartile range: 21-23). Most patients were of Lebanese nationality (92.6%), Muslim (81.7%) and were single (92.1%).

Students were almost equally distributed among the academic years, with 33.9% being in their 3rd year of bachelor in pharmacy, 29% in their 4th year, and 37.1% in their 5th year or postgraduate studies. Only 108 students (29.5%) were working in a community pharmacy. Study population characteristics are presented in table 1.

Table 1. Demographic characteristics of study participants (N=366)

Variable	N(%)
Gender	
Male	74 (20.2)
Female	292 (79.8)
Age in years (median, IQR)	22 (21-23)
Marital Status	
Single	337 (92.1)
Married	27 (7.4)
Divorced/widowed	2 (0.5)
Nationality	
Lebanese	339 (92.6)
Other	27 (7.4)
Religious Belief	
Muslim	299 (81.7)
Christian	46 (12.6)
No religious affiliation	7 (1.9)
Other	14 (3.8)
Academic Year	
3rd year of bachelor in Pharmacy	124 (33.9)
4th year of bachelor in Pharmacy	106 (29)
5th year of bachelor in Pharmacy	111 (30.3)
6th year (PharmD)	25 (6.8)
Working in a community pharmacy	
No	258 (70.5)
Yes	108 (29.5)

Knowledge about EC

Knowledge about emergency contraceptives was assessed in three aspects: knowledge of methods used for EC, knowledge of appropriate timing of EC, and pharmacy related questions (table 2).

Regarding the methods used for EC, more than half of the students (53.8%) considered medroxyprogesterone injection within 3 days of unprotected intercourse can be used as an EC method which is a false statement. The methods which can be correctly used for EC: namely combination birth control pills, progestin-only birth-control pills, and intrauterine device (IUD) placement within 5 days were correctly acknowledged by 68%, 54.6%, and 51.6% students respectively.

With regards to the timing of EC, 63.9% of students speculated that EC must be started within 24 hours of unprotected intercourse in order to be effective, which is not correct. 212 students (57.9%) indicated that EC could be initiated within 72 hours to be effective, while 154 students (42.1%) believed that it could be started within 120 hours- which are correct statements.

Concerning pharmacy practice related questions, the majority of students thought that EC worked by disrupting a newly implanted embryo (278 students -76%) which is not true. Knowledge of the commonly used EC brand names in Lebanon (Nevela® and Purperline®) and their active ingredients was sub-optimal, with only 132 students (36.1%) providing the correct answer. Knowledge of the mechanism of action for a commonly used EC (Ellaone®) also proved unsatisfactory (51.4% providing the correct answer). There was also a gap in knowledge concerning Lebanese regulations governing the dispensation of EC, whereby 260 students (71%) thought they were prohibited by law from dispensing EC without a prescription. Also, 67.5% didn't know they had the legal right to refuse to dispense EC based on moral or religious beliefs.

After computing the knowledge score about EC, scored ranged between 0 and 12, with a median of 5 (interquartile range: 4-7). Categorizing students using the median as a cut-off point resulted in 191 students (52.2%) having poor knowledge of EC,

Table 2. Knowledge about emergency contraceptives among pharmacy students of a University in Lebanon (N=366)

Question	Correct Answer	N(%) with correct answers
Method that may be used for EC		
Combination birth control pills (pills containing estrogen and progestin)	TRUE	249 (68)
Progestin-only birth-control pills	TRUE	200 (54.6)
Intrauterine device (IUD) placement within 5 days of unprotected intercourse	TRUE	189 (51.6)
Medroxyprogesterone injection within 3 days of unprotected intercourse	FALSE	169 (46.2)
Timing of EC		
EC must be started within 24 hours of unprotected intercourse in order to be effective.	FALSE	132 (36.1)
EC may be started within 72 hours of unprotected intercourse in order to be effective.	TRUE	212 (57.9)
EC may be effective if started within 120 hours of unprotected intercourse.	TRUE	154 (42.1)
Pharmacy practice related quetsions		
EC works by disrupting a newly implanted embryo.	FALSE	88 (24)
Navela® and Purpleline® are progestin-only products approved for EC.	TRUE	132 (36.1)
Ellaone® is a progestin receptor modulator (antiprogestin) product approved for EC.	TRUE	188 (51.4)
Lebanese pharmacists have a legal right to refuse to dispense EC based on moral or religious beliefs.	TRUE	119 (32.5)
Lebanese law prohibits pharmacists from dispensing EC without a prescription	FALSE	106 (29)
Knowledge about EC score (mean ±std)	5.39 ±2.11	
Knowledge about EC	**N(%)**	
Poor	191 (52.2)	
Good	175 (47.8)	

while 175 students (47.8%) demonstrated good knowledge.

Factors associated with knowledge about EC

Bivariable analysis (table 5) revealed that only age, academic year, and working status were significantly associated with knowledge about EC. Mean age of students who had good knowledge about EC (23.33, SD=3.86) was significantly higher than that of students with poor knowledge (22.52, SD=3.16), p=0.033. Students in their 5th year of bachelor in pharmacy or postgraduate year (PharmD) also had better knowledge than 3rd or 4th year students (p=0.001). Similarly, the percentage of students of having good knowledge among those working in community pharmacies (58.3%) was higher than that of students now working in pharmacies (43.45%), p=0.009.

On multivariable analysis (table 6), only two variables were significantly associated with knowledge about EC. Working in a community pharmacy increases the probability of having good knowledge by 1.85 times (p=0.014). Also, being in the 5th year or postgraduate compared with 3rd year of bachelor in pharmacy increases the probability of having good knowledge by 2.4 times (p=0.002), with no significant difference found between 4th year and 3rd year students (p=0.728).

Attitudes towards non-prescription EC

The majority of students exhibited a negative attitude towards EC being available for non-prescription use without mandatory counseling by a pharmacist, with nearly 70% expressing disagreement. 36.6% agreed that non-prescription EC will promote unsafe sex, and 31.2% believed it would discourage regular contraception use. 23.8% felt uncomfortable dispensing EC for moral or religious reasons, and only 30.6% felt competent instructing patients regarding the appropriate use of EC (Table 3).

By choosing the median as cut-off point for the attitude score, attitude towards nonprescription EC was generally negative for the majority of students (71.9%).

Factors associated with attitude towards non-prescription EC

None of the demographic factors was significantly associated with attitude towards non-prescription EC except for religious beliefs. Interestingly, students with no religious affiliations had the highest percentage of positive attitude towards non-prescription EC (85.7%), compared to 32.6% among Christians, and 25.4% among Muslims, p=0.002 (Table 5).

Practices related to the dispensation of EC medication

Among students working in community pharmacies (N=108), 66 students (61.1%) reported that they had dispensed EC medications in the past, and 63 students (58.3%) reported readiness to dispense EC. However, a good percentage were unconfident about dispensing EC medication, with 30.6% stating they were unsure of what do when faced with an EC request today, and 11.1% stating they would refer the patient another pharmacist/pharmacy (table 4).

DISCUSSION

This study revealed significant gaps in the knowledge about EC combined with negative attitudes, towards emergency

Table 3. Attitude towards non-prescription emergency contraceptives among pharmacy students of a University in Lebanon (N=366)

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	N (%)	N (%)	N (%)	N (%)	N (%)
a. EC should be available for nonprescription use WITH required counseling by a pharmacist.	50 (13.7)	65 (17.8)	115 (31.4)	87 (23.8)	49 (13.4)
b. EC should be available for nonprescription use WITHOUT required counseling by a pharmacist.	127 (34.7)	127 (34.7)	87 (23.8)	21 (5.7)	4 (1.1)
c. Nonprescription EC will promote unsafe sex.	40 (10.9)	76 (20.8)	116 (31.7)	92 (25.1)	42 (11.5)
d. Nonprescription EC will discourage regular contraception use.	39 (10.7)	78 (21.3)	135 (36.9)	84 (23)	30 (8.2)
e. I am uncomfortable dispensing EC for moral or religious reasons.	67 (18.3)	75 (20.5)	137 (37.4)	59 (16.1)	28 (7.7)
f. I feel competent instructing patients regarding the appropriate use of EC.	29 (7.9)	46 (12.6)	179 (48.9)	78 (21.3)	34 (9.3)
Attitude towards nonprescription EC	**N(%)**				
Negative attitude	263 (71.9)				
Positive attitude	103 (28.1)				

Table 4. Practices related to the dispensation of EC medication among pharmacy students currently working in community pharmacies (N=108)

Question	N(%)
Have you ever dispensed EC medication?	
Yes	66 (61.1)
No, I have never received a request for EC	37 (34.3)
No, I refer the patient to another pharmacy/pharmacist to purchase an EC medication	5 (4.6)
Does your pharmacy currently stock EC medication?	
Yes	88 (81.5)
No	20 (18.5)
What would you do if you were presented with a request for EC today?	
Dispense the medication	63 (58.3)
Refer the patient to another pharmacist or pharmacy	12 (11.1)
Not sure	33 (30.6)

Table 5. Bivariable results for factor associated with knowledge about EC and attitudes towards non-prescription EC among pharmacy students

	Knowledge about EC			Attitude towards nonprescription EC		
Variable	**Poor**	**Good**	**P value**	**Negative**	**Positive**	**P value**
Age (mean ±std)	22.52 ±3.16	23.33 ±3.86	**0.033**	22.77 ±3.50	23.26 ±3.62	0.248
Gender						
Male	38 (51.4)	36 (48.6)	0.872	52 (70.3)	22 (29.7)	0.734
Female	153 (52.4)	139 (47.6)		211 (72.3)	81 (27.7)	
Marital Status						
Single	176 (52.2)	161 (47.8)	0.997	246 (73)	91 (27)	0.146
Married	14 (51.9)	13 (48.1)		15 (55.6)	12 (44.4)	
Divorced/widowed	1 (50)	1 (50)		2 (100)	0 (0)	
Nationality						
Lebanese	175 (51.6)	164 (48.4)	0.445	243 (71.7)	96 (28.3)	0.79
other	16 (59.3)	11 (40.7)		20 (74.1)	7 (25.9)	
Religious Belief						

Muslim	153 (51.2)	146 (48.8)	0.801	223 (74.6)	76 (25.4)	**0.002**
Christian	27 (58.7)	19 (41.3)		31 (67.4)	15 (32.6)	
No religious affiliation	4 (57.1)	3 (42.9)		1 (14.3)	6 (85.7)	
Other	7 (50)	7 (50)		8 (57.1)	6 (42.9)	
Academic Year						
3rd year of bachelor in Pharmacy	74 (59.7)	50 (40.3)	**0.001**	94 (75.8)	30 (24.2)	0.323
4th year of bachelor in Pharmacy	65 (61.3)	41 (38.7)		78 (73.6)	28 (26.4)	
5th year of bachelor in Pharmacy	41 (36.9)	70 (63.1)		76 (68.5)	35 (31.5)	
6th year (PharmD)	11 (44)	14 (56)		15 (60)	10 (40)	
Working in a community pharmacy						
No	146 (56.6)	112 (43.4)	**0.009**	190 (73.6)	68 (26.4)	0.24
yes	45 (41.7)	63 (58.3)		73 (67.6)	35 (32.4)	

Table 6. Multivariable results for factors associated with knowledge about EC among pharmacy students

Variable	P value	Adjusted OR	95% CI
Age	0.862	1.01	0.94- 1.07
Working in a community pharmacy (yes vs. no)	**0.014**	1.85	1.14- 3.01
Academic Year			
4th year vs. 3rd year of bachelor in pharmacy	0.728	0.91	0.52- 1.57
5th year or postgraduate vs. 3rd year of bachelor in pharmacy	**0.002**	2.4	1.38- 4.18

OR: odds ratio, CI: confidence interval
Method: enter, omnibus test p value <0.001, Hosmer and Lemeshow test p value: 0.866, overall percentage classified: 61.8%

contraception (EC) among pharmacy students in Lebanon, emphasizing the need for targeted educational interventions. In addition, the study presented that older age, higher academic year level (5th year and PharmD), and working in a community pharmacy were all significantly associated with good knowledge among pharmacy students, suggesting that combining experience and education is critical in shaping understanding. In general, majority of pharmacy students had an overall negative attitude towards non-prescription EC. Having no religious affiliation was the only demographic factor significantly associated with a positive attitude towards non-prescription EC. Around half of the students working in a community pharmacy reported that they have dispensed EC before, and around the same percentage of students stated their readiness to dispense EC if they were presented with a request for EC.

The overall knowledge about EC among pharmacy students was insufficient across different aspects, particularly concerning appropriate methods, timing, and mechanisms of action. Many students failed to correctly identify the appropriate methods used for EC including combination birth control pills (the Yuzpe regimen), progestin only pills containing levonorgestrel, and IUDs[27]. Furthermore, there was an insufficient knowledge regarding the appropriate time window to administer EC. Combined oral contraceptives (COCs), IUDs, and ulipristal acetate (an anti-progestin) can be administered up to 5 days (120 hours) after unprotected sexual intercourse, while progestin only pills (levonorgestrel) should be administered within 3 days (72 hours) to ensure adequate efficacy[28]. Studies in Lebanon have shown inadequate knowledge on EC among women of childbearing age[13], insufficient knowledge about contraception among university students[14], and satisfactory knowledge about oral contraceptives among pharmacists[29]. However, there are no available studies assessing knowledge of pharmacy students about EC in Lebanon.

It is noteworthy that the study revealed 76% of students believed emergency contraception (EC) disrupts a newly implanted embryo, despite evidence demonstrating that EC methods work by preventing ovulation or fertilization and do not interfere with an established pregnancy or induce abortion[27,30]. Other studies also showed a similar misconception among pharmacy students about the mode of action of EC, with varying percentages between different academic years[26,31]. On the other hand, 97% of pharmacy students in a recent study conducted in the US were aware that EC doesn't induce abortion[15]. Moreover, being a fifth year or a PharmD student was significantly associated with higher knowledge among all pharmacy students. This finding aligns with the fact that pharmacy students at LIU take their pharmacology courses as well as a therapeutic course, focusing on endocrinology and women's health topics, during their fourth year. Besides, students at this academic year level (5th year and PharmD) should have finished 2 pharmacy practice experience courses (PPE) in community settings. This increases students' knowledge and experience regarding many community related topics including emergency contraception. Similarly, working in a community pharmacy, which translates

to a wider exposure and experience, was also positively associated with a good knowledge score. Our findings are similar to other studies, where higher knowledge was detected in pharmacy students with higher academic level[15,23,31]and possibly work experience[31]. In addition, the participated students in this study had suboptimal knowledge about the EC brands available in Lebanon as well as their pharmacological categories. These findings warrant the need for pharmacy curricula to introduce the knowledge of EC earlier in the program, for example in the first professional pharmacy year (third year) and before going to the first PPE course. Moreover, active learning activities about EC in pharmacy schools could improve knowledge among pharmacy students as well as their counseling skills[32].

An overall negative attitude score towards non-prescription EC was recognized in this study. In Lebanon, there are no designated laws that specifically prohibit pharmacists from dispensing EC without prescription. Lebanese pharmacists also reserve the right not to dispense emergency contraception based on moral or religious beliefs without any legal consequence. However, most of the pharmacy students in our study exhibited an inadequate knowledge of the Lebanese regulations governing the dispensing of EC. Although most of the students expressed their disagreement on the use of EC without counseling from the pharmacist, most of them felt that they were not competent enough to counsel about EC. This highlights that pharmacy students are willing to provide counseling services, but they are not equipped with the adequate knowledge to do so. In a similar study, higher academic year was significantly associated with a positive attitude towards the provision of EC with pharmacist counseling and the confidence to counsel about EC[31]. Having private areas to counsel patients about contraceptive medications has been associated with better counseling practices among pharmacists[29]. Although third of the students thought that EC could encourage unsafe sex and could discourage the regular use of contraception, the available evidence is neutral towards these statements[33]. Around fourth (23.8%) of the students felt uncomfortable dispensing EC for religious and moral reasons in comparison to 29.9 % in another study[26]. This might be due to the misconception that EC might induce abortion or harm an already established embryo. Interestingly, not being religiously affiliated was significantly associated with a positive attitude towards EC. Pharmacists should not associate EC with stigma or wrong sexual behaviors. On the contrary, pharmacists should recognize the use of family planning methods as a mean to decrease unintended pregnancies and induced abortions[34]. Pharmacists should be culturally competent and aware that each patient hold his own values that don't necessarily align with the pharmacist's moral values, or even align with the religion or the culture the patient himself belongs to[35]. Therefore, pharmacy students should be prepared to accept and provide patients from different social, cultural, and religious backgrounds.

In this study, only 58 % of students working in pharmacies expressed their readiness to dispense EC and thus reaffirming the negative attitudes that pharmacy students have towards EC. This inadequate readiness could be due to both the common misconceptions and the insufficient knowledge students have about EC. Having good EC knowledge, especially with regards to the non-abortifacient effect of EC, serves as one of the major drivers to dispense EC among pharmacists[36]. Furthermore, with the FDA approval for the first over the counter daily oral contraception pill[37], the importance of provision of contraception by pharmacists becomes more pronounced. Pharmacists could seize the opportunity to provide birth control for patients coming for EC or direct them to sexual health clinics, and thus increasing access to continuous contraception and decreasing unintended pregnancies[38].

Practical Implication

As accessible primary health care providers and women's health providers, pharmacists could be the first point of contact for patients with needs of EC services[6,39,40]. Pharmacy students are the future educators and facilitators of EC who will disseminate their knowledge and attitudes to their respective communities. Hence, pharmacy students, the pharmacists of the future, should be equipped with adequate knowledge and positive attitudes towards EC. The earlier introduction of emergency contraception topic in didactic and experiential learning courses and then reinforcing it in advanced courses will provide students the opportunity to better retain knowledge in the long term. In addition, EC modules in pharmacy curricula should debunk the common misconceptions associated with the use of emergency contraception such as inducing abortion. Access to family planning and contraception should also be highlighted in pharmacy curriculum as a basic human right and a matter of the utmost significance to the welfare and autonomy of women as well as the development of healthy communities[41,42]. Moreover, teaching future pharmacists about the laws and regulations governing the dispensing of emergency contraception will further facilitate the dispensing of EC. Accordingly, implementing changes in the pharmacy curriculum, pertaining to emergency contraception topic, will have a robust effect on the future of EC dispensing practice in different communities.

Limitations:

A cross-sectional research design was adopted in this study, and accordingly a cause-effect relationship can't be established. Also, the results can't be generalized to all pharmacy students in Lebanon as the participants were only from one pharmacy school out of five pharmacy schools in Lebanon. Moreover, the researchers in this study chose one course from each academic year to recruit participants which could have contributed to sample bias.

CONCLUSION

This study showed an inadequate knowledge about emergency contraception topic and an overall negative attitude towards EC among pharmacy students in a Lebanese university. This highlights the need to develop well-rounded emergency contraception modules in the school of pharmacy curriculum that doesn't only target improving EC knowledge, but also cultivates positive attitudes towards EC by refuting common

misconceptions and shedding the light on women's right of reproductive and contraceptive autonomy. Further studies are needed to assess Lebanese pharmacy students' knowledge and attitudes towards EC on a national level.

AUTHORS' CONTRIBUTION

Seham Kanaan: conceptualization, investigation, and writing – original draft.

Dana Ayoub: formal analysis.

Sahar Nasser: writing – original draft.

Faten Hamed: writing – original draft.

Mariam Dabbous: data curation and writing – review & editing.

Iqbal Fahs: writing – review & editing.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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