ORIGINAL ARTICLE

Self-medication among pregnant women attending outpatients' clinics in northern Jordan-a cross-sectional study

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Abstract

Self-medication can facilitate patients' access to medicinal products, save time, and reduce financial and health-care service use burden. On the other hand, irresponsible use of self-medications can result in adverse consequences. Self-medication is common among different demographic groups including pregnant women. In general, medicinal products might have harmful effects on mothers and baby. This study aimed to assess self-medication practices among pregnant women in the northern region of Jordan. A cross-sectional study was conducted on pregnant women attending outpatient clinics in the northern region of Jordan. Self-medication practices among the target population were assessed using a survey questionnaire that was administered through interviewer-assisted mode. Data were collected between December 2019 and September 2020, and descriptive statistics and inferential analysis were applied. A total of 1,313 pregnant women were surveyed (response rate = 95.50%). Self-medication and the use of herbal remedies were practiced by 33.10% and 32.14% of the participant, respectively. Headaches and general pains were the most frequently reported conditions treated by self-medication practice with either conventional medicinal products or herbal remedies. The gravidity (≥4) and the gestational stage (≥28 weeks) were the predictors of self-medication practice. This study showed that self-medication was not widely practiced by pregnant women in the northern region of Jordan. Disease simplicity and previous history were the main motives for self-medicating. Efforts should be made by health-care providers to address pregnant women and educate them to increase their awareness about the unsafe use of medicines and the harmful effects on fetus.

KEYWORDS
herbal remedies, Jordan, pregnant women, self-medication

1 | INTRODUCTION

Self-medication is defined as the "selection of medicines by individuals to treat self-recognized illness or symptom".[1] By definition, self-medication involves the use of medicines to manage self-diagnosed conditions, symptoms, or the re-use of previously prescribed medications to manage re-current or chronic conditions or symptoms.[2]

In comparison to prescribed medications, responsible self-medication is more convenient for patients in terms of health-care cost and accessibility to medicines, and it avoids unnecessary visits to health-care facilities.[3-6] Moreover, responsible self-medication empowers patients to be more involved in the health care, and it improves knowledge and awareness on health and well-being.[6] In addition to patient-level benefits, responsible self-medication is among the mechanisms used to support and maintain national health-care systems and sustainability.[2,7-9]

On the other hand, improper self-medication is associated with several potential risks at individual, societal, and health-care service levels.[10,11] Inappropriate self-medication practices might result in inaccurate self-diagnosis, masking of symptoms, delays in seeking medical care, incorrect choice of medicinal product or route of administration, unnecessary multiple drugs use, unwarranted adverse drug reactions, and misuse and abuse of medical products.[10,11] Therefore, inappropriate self-medication might pose an undue burden on the health-care systems.[12-14]

While self-medication is commonly practiced by different population groups,[13,15,16] pregnant women are a patient group of particular interest due to the potential risks that self-medication may have on both mother and baby.[17,18]

During the gestational period, pregnant women experience a variety of acute and minor ailments such as pain, headaches, nausea, heartburn, hemorrhoids, and urinary tract infections.[19,20] Therefore, it is common for pregnant women to use non-prescription medicine and herbal remedies to manage and treat minor ailments.[21]

Previous studies have reported that the prevalence of self-medication among pregnant women ranges from 2.2% to 72.4%.[20,22,23] Available evidence shows that the most frequently used medications for self-treatment in pregnancy include analgesics, antacids, antibiotics, antihistamines, vitamins, and herbal preparations.[21-23] Self-medication practicing pregnant women are driven by the desire for saving time and cost, relieving the disease promptly, and the familiarity with signs and symptoms.[21-24] However, self-medication during pregnancy is associated with numerous risks that might result in structural and functional defects and abnormalities to the fetus or might lead to miscarriage.[3,4,25-27]

Despite the risks associated with self-medication in pregnancy, self-medicating is on the rise globally, particularly in developing countries. The ease of facilitated access to over-the-counter (OTC) and prescription medications in the developing countries can result in and propel pregnant women to self-manage a variety of complaints and acute or short-term illnesses.[22,23]

In Jordan, the practice of self-medication has been extensively investigated in the past two decades.[28-31] Similar to other developing countries, the practice of self-medication in Jordan includes utilizing non-prescription and prescription medications, especially antibiotics.[28-32] The primary source of self-medicated products is pharmacies, where medications can be purchased with or without the consultation of a pharmacist or other health-care professionals.[31] Other sources of self-medication products are medicinal products shared between family members, friends, and neighbors and leftover medicinal products.[30,31] The most predominant products used by Jordanians for self-medication are analgesics, cough and cold medicines, antibiotics, vitamins, antacids, laxatives, and antimotility agents.[28,33]

While there is a number of studies that have investigated and described the prevalence and patterns of self-medication practices among different population groups in Jordan,[34-36] there is no clear evidence available on self-medication practices among pregnant women. Therefore, this current study aimed to identify the prevalence and patterns of self-medication and the most commonly used self-medicated products and herbal remedies among pregnant women in Jordan.

2 | MATERIALS AND METHODS

2.1 | Study settings, design, and subjects

This study was a cross-sectional study that targeted pregnant women attending outpatients' clinics in the northern region of Jordan. Self-medication was defined as taking medications, herbal products, or supplements without rational prescriptions or as OTC medications. Pregnant females who are pregnant ≥8 weeks were invited to participate in the study and were recruited after obtaining a signed consent, and those who refused to participate were excluded from the study.

2.2 | Sample size

For the study, a minimal sample of 385 participants were needed. The sample size was calculated based on a 95% confidence interval, a standard deviation of 5%, 0.05 level of significance, and unlimited population size. The minimal sample would give adequate power for bivariate, multivariable analysis to be carried out. The sample size was calculated using Raosoft software sample size calculator.

2.3 | Data collection tool and study instrument

Self-medication practices among the targeted population were examined using a questionnaire instrument. The questionnaire was developed by the research team based on an extensive literature review, and guided by the study's aims and objectives.[22,24,37] A panel of experts reviewed the initial draft of the questionnaire. The draft was piloted on a convenient sample of 10 pregnant women.

The resulting data from the pilot study were excluded from the final analysis. Following the expert review and survey piloting, necessary amendments were made.

The final version of the questionnaire consisted of 34 questions divided into four sections as per the following: section one: participant's demographics and characteristics such as age, employment status, and level of education. Section two: participant's obstetric history such as gravidity, parity, number of miscarriages, and the gestational age of the current pregnancy. Section three: self-medication practices during pregnancy. Section four: utilization of herbal medicines during pregnancy (Supplementary Material 1).

In order to secure a high response rate, and to minimize the possibility of missing data and incomplete questionnaires, the questionnaire instrument was administered through interviewer-assisted administration route. Two research assistants (clinical pharmacists) were trained to carry out face-to-face structured interviews systematically.

In the period between December 2019 and September 2020, a total of 1,375 pregnant women attending outpatients' clinics were approached by the research assistants. Eligible participants were provided with the participant's information sheet, which outlined the research aim and objectives and the voluntary nature of their participation. Participants in the study were asked to sign and return the participant's consent form. Each participant was assigned an anonymous participant identification code.

2.4 | Statistical analysis

Descriptive statistics in the form of frequencies, percentages, mean, and standard deviation (SD) were used to report patient demographics, and Pearson's Chi-square test and T-test were used for group comparison in traits. Univariate analysis was used to compare participants who practiced self-medication and who did not. The comparison was carried out in terms of age, employment status, level of education, and obstetric history such as gravidity, gestational age, and mode of previous deliveries.

Associations between participants' demographics and gestational history and self-medication practices were examined using binary logistic regression; a two-sided $p < 0.05$ was considered as statistically significant. Data analysis was carried out using IBM Statistical Package for the Social Sciences (SPSS®).

2.5 | Ethical consideration

The Research Ethics Committee granted ethical approval at Jordan University of Science and Technology (JUST) and King Abdulla University Hospital (KAUH), Irbid, Jordan (Reference No.: 13/1/2888). Additionally, the Jordanian Ministry of Health reviewed and approved the study protocol (Reference No.: MoH/REC/2019/219).

3 | RESULTS

3.1 | Demographic data

Over 9 months, a total of 1,313 of 1,375 women agreed to take part in the study (response rate of 95.50%), 62 women declined to participate due to time limitation or personal reasons. The vast majority of recruited participants, 1,237 (94.2%), were attending hospital-based outpatient clinics. The mean age of participants was 28.54 ± 8.36 years. The majority of the study participants, 978 (74.50%), were unemployed, and only 78 (5.90%) were employed at a medical field at the time of the interviews. Regarding the level of education, 818 participants (62.30%) had an academic degree (college or university).

3.2 | Obstetric history

Of the 1,313 participants, 772 (58.80%) were in their third trimester. The majority of recruited participants, 1,100 (83.80%), had a history of pregnancy, with 507 (38.60%) having a history of four pregnancies or more. Four hundred and seventy-seven (36.40%) participants experienced miscarriage. Vaginal delivery was the most common mode of delivery, reported by 624 (47.50%) participants. Smoking was reported by only 86 (6.60%) of the study participants. Table 1 summarizes participants' demographics and obstetric history.

3.3 | Patterns of self-medication practices during pregnancy

Self-medication was reported by 434 (33.1%) participants, of which 362 (83.4%) used one medicinal product without prescription. Only nine self-medicating participants (2.1%) reported that they had got harmful effect from self-medication practice while only four of them (0.9%) needed hospitalization.

Among the conditions for which participants use medications without a prescription, headache and joint pain were the most frequently reported by 371 (85.5%) participants, followed by common cold by 51 (11.8%) of the study participants. Therefore, it was not surprising that analgesics and pain killers were the most frequently used medications without prescription, used by 383 (88.2%) participants. On the other hand, 58 (13.4%) participants reported the utilization of antibiotics without prescription. Of the 434 self-medication practicing participants, 345 (79.5%) got their medication from the pharmacy (Table 2).

Practicing self-medication was driven by previous experiences with the disease and simplicity of the condition as reported by 47.7% and 36.6% of self-medicating participants, respectively. On the other hand, among the 879 (66.9%) participants who avoided self-medication, 563 (64.1%) were concerned about harming their fetuses, and 548 (62.4%) were worried about abortion (Figure 1).

TABLE 1 Participants' demographics and obstetric history

Investigated Attributes	Participants' group		
	Overall Study Participants N (%)	Practicing Self-medication N (%)	Not Practicing Self-medication N (%)
Number of participants	1,313 (100%)	434 (33.1%)	879 (66.9%)
Participants' Age (Years), mean±SD	28.54 ± 8.37	31.11 ± 5.71	29.28 ± 5.67
Outpatient Clinic			
King Abdullah University hospital	464 (35.3%)	141 (32.5%)	323 (36.8%)
Princess Raya Hospital	410 (31.2%)	144 (33.2%)	266 (30.3%)
Princess Basmah Hospital	310 (23.6%)	115 (26.5%)	195 (22.2%)
JUST Health Center	55 (4.2%)	14 (3.2%)	41 (4.7%)
Princess Badea'a Hospital	53 (4.0%)	14 (3.2%)	39 (4.4%)
Others	21 (1.6%)	6 (1.4%)	15 (1.7%)
Level of Education			
Upper secondary school or less	495 (37.7%)	165 (38.0%)	330 (37.5%)
Bachelor or diploma degree	774 (59.0%)	257 (59.2%)	517 (58.8%)
Postgraduate degree	44 (3.4%)	12 (2.8%)	32 (3.6%)
Employment Status			
Unemployed	495 (37.7%)	165 (38.0%)	330 (37.5%)
Employed at non-medical field	774 (59.0%)	257 (59.2%)	517 (58.8%)
Employed at medical field	44 (3.4%)	12 (2.8%)	32 (3.6%)
Health insurance			
Insured	1010 (76.9%)	340 (78.3%)	670 (76.2%)
Uninsured	303 (23.1%)	94 (21.7%)	209 (23.8%)
Medical and obesity history			
Gestational age of the current pregnancy			
≤ 15 weeks	183 (13.9%)	39 (8.9%)	144 (16.4%)
16–27 weeks	358 (27.3%)	116 (26.7%)	242 (27.5%)
≥ 28 weeks	772 (58.8%)	279 (64.3%)	493 (56.1%)
Number of previous pregnancies			
None	213 (16.2%)	38 (8.8%)	175 (19.9%)
1–3 pregnancies	593 (45.2%)	183 (42.2%)	410 (46.6%)
4 or more pregnancies	507 (38.6%)	213 (49.1%)	294 (33.4%)
Number of miscarriage			
None	836 (63.7%)	265 (61.1%)	571 (65.0%)
1–3	450 (34.3%)	164 (37.8%)	286 (32.5%)
≥4	27 (2.1%)	5 (1.2%)	22 (2.5%)
Mode of delivery[a]			
Vaginal	624 (47.5%)	233 (53.7%)	391 (44.5%)
Cesarean section	476 (36.3%)	163 (37.6%)	313 (35.6%)
Have not given birth before	213 (16.2%)	38 (8.8%)	175 (19.9%)
Smoking			
Yes	86 (6.6%)	34 (7.8%)	52 (5.9%)
No	1227 (93.5%)	400 (92.2%)	827 (94.1%)

Abbreviations: JUST, Jordan University of Science and Technology; N, Number; SD, Standard Deviation

[a]In the last pregnancy

TABLE 2 Patterns of self-medication in pregnancy

Investigated Attributes	Number of Participants (%)
Stage of pregnancy during which self-medication was practiced	
First trimester	121 (27.9%)
Second trimester	107 (24.7%)
Third trimester	99 (22.8%)
During the whole pregnancy	107 (24.7%)
Health condition (complaint) for which self-medication was practiced*	
Headache and joint pain	371 (85.5%)
Common cold	51 (11.8%)
Nausea and vomiting	39 (9.0%)
Urinary tract infection	23 (5.3%)
Others	36 (8.3%)
Pharmacological classes used for self-medication[a]	
Pain killer	
Paracetamol	359 (82.7%)
NSAIDs	12 (2.8%)
Paracetamol and NSAIDs	12 (2.8%)
Antibacterial	
Penicillin	30 (6.9%)
Cephalosporin	28 (6.5%)
Vitamins	
Multivitamins	134 (30.9%)
Folic acid supplements	120 (27.7%)
Number of used medicinal products	
1	362 (83.4%)
2	66 (15.2%)
≥3	6 (1.4%)
Source of medicinal products[a]	
Pharmacy	345 (79.5%)
Available at home	113 (26.0%)
Friend/Neighbor	6 (1.4%)
Sought a physician's advice before using the medicinal products	
Yes	160 (36.9%)
No	274 (63.1%)
Reasons for practicing self-medication[a]	
Previous experience with the disease	207 (47.7%)
The simplicity of the disease	159 (36.6%)
Medicinal products are easy to be obtained	92 (21.2%)
Time saving	64 (14.7%)
Limited access to the physician	19 (4.4%)
Long distance to reach a health-care facility	8 (1.8%)
Others	7 (1.6%)
Source of information about medicinal products[a]	
Knowledge from previous experience	268 (61.8%)
Advice from a physician	160 (36.9%)

(Continues)

TABLE 2 (Continued)

Investigated Attributes	Number of Participants (%)
Advice from a pharmacist	94 (21.7%)
Advice from a friend or a neighbor	25 (5.8%)
Social media	18 (4.2%)
Advice from a nurse	14 (3.2%)
Read the patient's information leaflet	
Yes	271 (62.4%)
No	163 (37.6%)
Read sections from the patient's information leaflet[a]	
Indications	74 (17.1%)
Warnings and contraindications	179 (41.2%)
Adverse drug reaction	190 (43.8%)
Recommended dose	60 (13.8%)
Reasons for not reading the patient's information leaflet[a]	
Familiarity with the medicinal product	111 (25.6%)
Unavailability of the patient's information leaflet	36 (8.3%)
Inability to understand information listed in the leaflet	15 (3.5%)
Inability to read the leaflet	5 (1.2%)

Abbreviation: NSAID, non-steroidal anti-inflammatory drugs.
[a]Participants were able to provide more than one answer.

3.4 | Medical advice and source of information

In discussing seeking medical advice, 275 (63.4%) of self-medicating participants did not pursue their physicians' advice before using the medications. In fact, 268 (61.8%) of self-medicating participants relied on their previous experiences and knowledge in choosing and utilizing medicines.

However, the majority of self-medicating participants, 271 (62.4%), reported that they had read the patient's information leaflet, especially the adverse drug reactions and warning and contraindication sections (Table 2).

3.5 | The pattern of utilizing herbal remedies during pregnancy

Of the 1,313 participants, 422 participants (32.14%) reported that they use herbal remedies to relieve and manage general pain (23.5%), abdominal pain (15.6%), and cough (14.7%). The vast majority of herbal remedies utilizers (75.6%) considered herbal remedies to be safer and have fewer side effects compared to conventional medicines. On the contrary, 531 (59.6%) of herbal remedies non-users believed that herbal remedies might cause miscarriage. Finally, of the 1,313 participants, only 170 (12.9%) reported the concomitant use of herbal remedies and non-prescription medicines (Table 3).
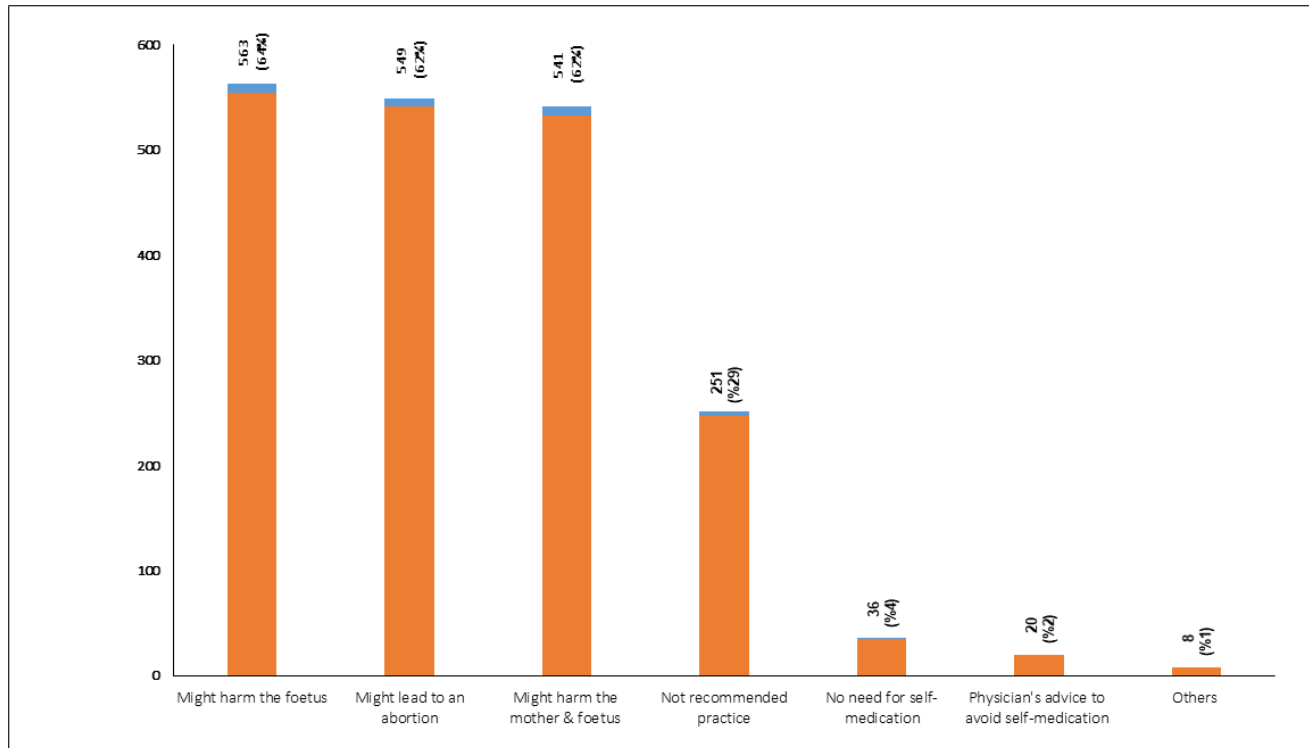
FIGURE 1 Reasons for avoiding self-medication

3.6 | Predictors of self-medication in pregnancy

Univariate analysis showed that being an older mother, being pregnant for four or more times, and the gestational age of ≥28 weeks were significantly associated with self-medication ($p < .001$). On the contrary, self-medication was not significantly associated with the level of education, employment status, history of bad obstetric, or mode of delivery (p-value >.05).

The logistic regression model, using a backward stepwise (Wald) method, revealed that there were two factors significantly associated with practicing self-medication by pregnant women: the gestational age of the current pregnancy (Odds Ratio (OR) = 1.385, 95% Confidence Interval (CI): 1.09–1.76), and gravidity of four or more pregnancies (OR = 1.901, 95% CI: 1.50–2.41) (Table 4).

4 | DISCUSSION

Self-care practice and intervention are being promoted as cost-effective tools that can maintain health and well-being and save scarce resources. Self-medication is one of the frequently reported self-care practices at the individual level.[9,38] Self-medication is a common practice in Jordan, and it is driven by a variety of socio-economic factors.[7,39] This is the first study that investigated self-medication practices among pregnant women in Jordan. The study targeted pregnant women attending outpatients' clinic in the northern region of Jordan. The questionnaire instrument collected data related to participants' demographics, obstetric history, self-medication patterns, drivers for self-medication, factors associated with self-medication, sources of medical information, and the utilization of herbal remedies.

Similar to the globally reported prevalence of self-medication among pregnant women, emerging evidence from this study showed that pregnant women did not widely practice self-medication practice, with around one-third (33%) self-medicated themselves.[22] However, the prevalence of self-medication among Jordanian pregnant women is lower than that reported by the general population.[33] The lower prevalence could be explained by the notion that pregnant women are generally more concerned about the harm, especially teratogenic effect that medicinal products may have on their fetus.[40,41]

Gastrointestinal conditions, such as heartburn, hemorrhoids, constipation, nausea, and vomiting, are among the most frequently reported complaints during pregnancy.[42] However, only 9% of the self-medicating participants used medicines to treat nausea and vomiting, and only 7.1% and 3% of herbal remedies users relied on these remedies to manage excessive intestinal gases and constipation, respectively. Not relying on self-medication and herbal remedies can be attributed to the fact that these complaints are self-limiting in general and can be treated by non-pharmacological intervention and lifestyle modifications.[43] In line with national, regional, and international trends, self-medicating participants mainly used medicinal products to manage headaches and pain, and their medicine of choice was analgesic, especially paracetamol, which was the pain reliever of choice during pregnancy.[34,44-47]

Similar to global studies, mainly in developing countries, our study showed that familiarity with the disease and its simplicity were the main drivers for self-medication among the study cohort.[24,48] The same motives were reported in the study that targeted pharmacy students in Jordan.[34] Frequently, the absence of medical health insurance, limited access to health-care professionals, and the high cost of medical fees were reported to drive self-medication practices.[20,22,33] However, in this study, insurance was not significantly associated with self-medication practice nor was

TABLE 3 Use of herbal remedies during pregnancy

Investigated Attributes	Number of Participants (%)
Health condition (complaint) for which herbal remedies were used	
Yes	422 (32.1%)
No	891 (67.9%)
Health condition (complaint) for which herbal remedies were used (N = 422)	
General pain	99 (23.5%)
Cough	62 (14.7%)
Excessive intestinal gases	30 (7.1%)
Constipation	14 (3.3%)
Abdominal pain	66 (15.6%)
Nausea	23 (5.5%)
Others	128 (30.3%)
Reasons for using herbal remedies (N = 422)[a]	
Herbals remedies are more effective than medical products	23 (5.5%)
Herbals remedies have fewer side effects	319 (75.6%)
Herbal remedies at a lower cost	17 (4.0%)
Herbals remedies can be obtained without a prescription	18 (4.3%)
The treated disease is not a serious one	76 (18.0%)
Time saving	10 (2.4%)
Reasons for not using herbal remedies (N = 891)[a]	
May cause abortion	531 (59.6%)
May harm mother and fetus	126 (14.1%)
Not a recommended practice	81 (9.1%)
May Harm fetus	78 (8.8%)
No need to use herbal remedies	78 (8.8%)
Insufficient information	53 (5.9%)

Abbreviations: N, number.

[a]Participants were able to provide more than one answer.

accessibility to health-care service. The lack of influence of health insurance might be explained by the fact that the majority of the study participants had health insurance and were already visiting a hospital-based clinic.

The choice of medication for self-treatment was influenced by a number of extrinsic and intrinsic factors. The intrinsic factors were more dominant, as the majority of medicating participants relied on their previous experiences and knowledge in selecting their medication. On the other hand, less than one-third followed the advice of their physicians. Pharmacists were not the primary source of information; this is particularly interesting as pharmacists are the most accessible and approachable health-care professionals; patients interact with and seek pharmacists' advice more often than other health-care professionals.[38,49] Moreover, pharmacists are considered to be the first point of contact for patients in the northern region of Jordan.[50]

The effect of previous experiences was also evident in assessing factors associated with self-medication practices. Results showed that practicing self-medication was found to be significantly associated with having previous pregnancies and being in the third trimester. Previous pregnancies might have equipped mothers with needed knowledge and experiences and made them more comfortable in treating their illnesses by themselves.

For this study, the research team used location-based sampling to identify eligible participants, that is, pregnant women. This sampling technique facilitated getting access to eligible participants in a timely manner. Its effect was also evident in the high response rate achieved for this study.

As previously mentioned in the methods section, this study deployed interviewer-administered response mode. Adopting interviewer-assisted mode helps in getting high response rate, limiting cases of missed responses (missing data), minimizing the possibility of misinterpreting questions, and enabling interviewers to elaborate and explain the questions to the participants. This effect was evident in securing a high response rate (95.5%) of the approached eligible participant, and the absence of missing data and incomplete surveys. Moreover, the adopted response mode allowed for providing detailed answers regarding the type of used medications, treated health conditions, reasons for self-medication, and source of information. Despite the fact that Jordan has one of the highest rate of smoking worldwide, with 17% of Jordanian women are smokers,[51] only 6.6% of the study participants reported to be a smoker. The lower reported smoking rate could be attributed to response bias, where participants might be uncomfortable or embarrassed to say that they were smoking despite being pregnant.

TABLE 4 Predictors of self-medication practice during pregnancy

Independent variable	B	SE	Odds ratio	95% CI	p-value
Age of current pregnancy ≥28	0.326	0.122	1.385	1.09–1.76	0.008*
Gravidity ≥4	0.642	0.120	1.901	1.50–2.41	<0.001*

Abbreviations: B, Regression coefficient; SE, Standard Error associated with the coefficient B.

*p-value <0.05.

5 | LIMITATIONS

The current study targeted pregnant women attending outpatients' clinic in the northern region of Jordan "location-based sampling", which minimizes the diversity in the study sample and hence limit the generalizability of the study findings.

The use of interviewer-administered response mode may trigger response bias, where participants feel that they have to provide a socially desirable response. Self-medication is not widely encouraged for pregnant women, so there is a possibility that some participants provided an inaccurate account of their self-medication practices. Participants might be obliged to provide socially acceptable answers, and not to be viewed as irresponsible mothers with tendencies of harming their fetuses.

6 | CONCLUSION

Our study showed that one-third of the study participants self-medicated or used herbal remedies during pregnancy. Being in the third trimester and the number of previous pregnancies (gravidity ≥4) were found to be predictors of self-medication practice. It is recommended that health-care providers, such as pharmacists and physicians, should address pregnant women and educate them to increase their awareness about the unsafe use of medicines and the harmful effects on fetuses. Pharmacists should follow evidence-based practice guidelines and consider the harmful risk when dispensing medications for pregnant women without rational prescriptions or even OTC medication.

The study can be enhanced by targeting a more diverse population and recruitment sites. The future research should look more deeply and comprehensively into socioeconomic factors such as income, type of insurance (private vs. public), place of residence (urban vs. rural), social norms, and behavioral cues.

CONFLICT OF INTEREST
The authors have declared no conflict of interest.

AUTHOR CONTRIBUTIONS
Mervat M Alsous conceived and designed the research, analyzed the data, and wrote and revised the manuscript. Sayer I Al-azzam conceived and designed the research, and wrote and revised the manuscript. Mohammad B Nusair conceived and designed the research, and wrote and revised the manuscript. Saja A Alnahar conceived and designed the research, and wrote and revised the manuscript. Nail A Obeidat conceived and designed the research and revised the manuscript.

DATA AVAILABILITY STATEMENT
Raw data of the study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.