

## Medication Use During Pregnancy and Breastfeeding: Awareness and Perceptions among Libyan Women

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### ABSTRACT

Pregnancy is a distinct physiological state in which medication use presents both challenges and concerns due to altered drug pharmacokinetics. In this study, we aimed to evaluate the awareness and perceptions of medication use during pregnancy and breastfeeding among Libyan women. This was a cross-sectional study, questionnaire-based study conducted between September 2024 and March 2025. Of 227 sample a total of 193 women with response rate 82% were included in the final analysis. Out of total, 82% were under the age of 45, and 98% had some level of education. Approximately 53% reported significantly taking medication at least once a week during pregnancy. While 76% either agreed or partially agreed that all medications should be avoided during pregnancy, 28% acknowledged an increase in medication use during this period. 72% believed that medications taken during pregnancy are more harmful than beneficial, and 98% stated that they follow prescribed treatments. Notably, 83% perceived medication use in early pregnancy as harmful or potentially harmful. Women aged 26–45 and those with bachelor's degrees were more likely to believe herbal medicines are safe with P-values = 0.017 and 0.001, respectively, while women with postgraduate education disagreed with this view P-value = 0.97. Regarding specific medications, 54% reported using medication for heartburn or gastritis, 39% used antibiotics. 10% used Asthma/Allergy medications, with significant associations among participants with public education and bachelor's degrees P-value=0.001 and 0.03, respectively. The primary source of information for 93% of the participants was physicians, while 23% consulted pharmacists. Age and educational background were strongly linked to perceptions of herbal remedy safety. Overall, medication and herbal remedy use among Libyan pregnant and breastfeeding women, as well as their safety perceptions, were closely associated with age and educational background.

**Keywords:** Breastfeeding, Libyan Women, Medication Safety, Pregnancy.

## INTRODUCTION

Pregnancy represents a unique physiological state in which the administration of medication presents challenges and concerns due to altered drug pharmacokinetics. As a result, the safety of pharmaceutical usage during pregnancy has emerged as a global concern, attracting the attention of pharmacists, healthcare professionals, and expectant mothers. Pregnant ladies frequently utilize drugs to address diverse symptoms and health issues. To enhance compliance with prescribed therapies, it is crucial for healthcare providers to comprehend a pregnant woman's perspectives and attitudes regarding medication use during counseling [1]. The administration of medication during pregnancy, whether over-the-counter or prescribed, raises significant concerns for numerous pregnant mothers [2].

Pregnancy is a complex condition in which physiological changes can influence existing health conditions or lead to pregnancy-specific disorders. These physiological shifts can also impact the pharmacokinetics and pharmacodynamics of medications, affecting how drugs are absorbed, distributed, and metabolized. As a result, therapeutic treatment plans often need to be adjusted during pregnancy. A thorough understanding of both pregnancy-related physiological changes and gestation-specific drug responses is essential to ensure effective treatment while minimizing risks to both the mother and the fetus [3].

Managing risks during pregnancy is particularly complex, as it involves the health and wellbeing of both the mother and her unborn child. The historical events such as the thalidomide incident in the 1960s continue to shape perceptions, raising concern over the teratogenic risks of medications. Thalidomide was a commonly used medication during the late 1950s and early 1960s, it was utilized to alleviate nausea in pregnant women. By the 1960s, it was revealed that the medicine had induced significant birth abnormalities in thousands of infants [4].

Healthcare providers face significant challenges when prescribing medications during pregnancy, as many drugs can cross the placental barrier, posing a potential risk of congenital abnormalities in the fetus. Although most over-the-counter (OTC) medications are considered generally safe, some lack established safety data or may cause adverse effects that differ based on the stage of fetal development [5].

Since the issues with thalidomide and diethylstilbestrol in the mid-20th century, regulatory bodies, like the U.S. Food and Drug Administration (FDA), have mandated extensive testing before approving drugs for pregnancy. Over the past four decades, FDA has withdrawn numerous medications and medical devices from the market due to their heightened health risks for women. To support safer decision-making, the FDA also developed a classification system that places medications into five pregnancy risk categories [6].

Globally, healthcare providers face additional challenges, as most medications can cross the placental barrier, creating potential risks for fetal development. Ethical constraints in clinical trials involving pregnant populations result in numerous medications lacking comprehensive safety profiles, hence confounding prescription choices. Women who are pregnant or may become pregnant have historically been omitted from clinical trials for novel pharmaceuticals. There is an increasing acknowledgment of the necessity to collect data from this demographic, since they are the probable users of these medications, to facilitate safe, evidence-based,

collaborative clinical decision-making. Researchers and regulators frequently exhibit hesitation to conduct such studies due to apprehensions over harm, especially to the fetus [7].

Despite the aforementioned challenges, research on medication use in pregnancy remains limited, especially in the Middle East and North Africa region. Understanding pregnant women's perceptions and decision-making processes could enable healthcare providers to offer better-targeted advice and support. With clearer guidance, culturally sensitive education, and improved access to counseling, the medical community could bridge gaps in knowledge and empower pregnant women to make informed decisions, ensuring the safety and health of both mother and child.

In Libya, however, medication misuse is prevalent, highlighting the need for enhanced pharmacist training in counseling and addressing drug-related issues, particularly for pregnant patients. Addressing these knowledge gaps could better support healthcare providers in guiding safe medication practices for pregnant women worldwide.

Research suggests that pregnant women often overestimate the risks linked to both prescription and OTC medications, which may lead them to avoid treatment for manageable conditions. Self-medication with OTC drugs is commonly practiced by the general population, including expectant mothers, to treat various health issues [8]. However, this practice may negatively impact maternal and fetal outcomes in pregnant women. Due to rise in incidence of teratogenicity linked to medications, the U.S. FDA implemented a categorization system to define the safety of drugs during pregnancy and their effects on fetal development. This system range from Category A indicates no risk to the fetus, Category X indicates clear evidence of teratogenicity [9],[10].

In 2015, FDA discontinued the use of the ABCDX pregnancy risk categories previously used to evaluate medication safety during pregnancy. The FDA Pregnancy and Lactation Labeling Rule (PLLR) replaced the previous classification system, requiring a narrative format to present detailed risk information, clinical considerations, and supporting data. The new labeling is divided into three main sections: 1) Pregnancy, including labor and delivery; 2) Lactation; and 3) Females and males of reproductive potential [11].

Pregnant women often experience a range of symptoms, from nausea to more serious conditions requiring medical intervention that may necessitate medication. It is estimated that 70–80% of pregnant women experience Nausea and Vomiting in Pregnancy (NVP) [12].

For women with pre-existing conditions such as diabetes, asthma, or autoimmune diseases, maintaining treatment regimens is essential to prevent adverse outcomes, such as preeclampsia, low birth weight, or stillbirth. A woman's understanding of teratogenic risks is essential for ensuring a safe pregnancy and a healthy fetus. Our study found that participants had insufficient knowledge about teratogens, highlighting the urgent need to raise awareness among mothers about the harmful effects of common teratogens [13].

The historical context of medication use in pregnancy plays a significant role in shaping risk perceptions. Similar issues with diethylstilbestrol further contributed to a cautious approach within the medical community. In 1979, the Food and Drug Administration established a

mechanism to assess the teratogenic risk of medications by evaluating the quality of evidence from both animal and human trials in response to these instances. It offers therapeutic direction for the practitioner throughout that period [14]. However, these historical precedents have also influenced societal attitudes, leading many pregnant women to view all medications with caution, often overestimating potential risks, fear of fetal harm restricts the prescribing and taking of some advised medications [15].

International data reveal a tendency among pregnant women to overestimate teratogenic risks, which can lead to reluctance in treating manageable symptoms or conditions, potentially impacting both maternal and fetal health [2],[16].

A study found that educational level and parity didn't affect the perceptions of medication use during pregnancy and breastfeeding [1]. Additional research has suggested that the parity and educational attainment of pregnant women may affect their perceptions regarding medication use, however the results are varied [17],[18]. A study involving Norwegian women indicated that those with higher education levels exhibited greater reluctance to use medicines during pregnancy. Conversely, women with lower levels of education perceived pharmaceuticals as dangerous and regarded herbal remedies as safe [19].

In 2022 in Saudi Arabia, Namshah A Alhajri and others noted that many women had negative beliefs about taking certain medications. Comprehending these issues may facilitate optimal counseling for pregnant women, enhancing medication adherence and mitigating adverse effects [20]. A separate study from KSA indicated significant disparities in pregnant women's views on the hazards associated with the use of OTC drugs [5].

The data indicated that a significant percentage of women had a favorable attitude and appropriate practices regarding medication usage and limits during pregnancy. Nonetheless, the knowledge level among the study group was unexpectedly inadequate. It is imperative to educate pregnant women on the appropriate use and abstention from drugs during gestation [21].

Concerning chronic diseases during pregnancy, beliefs shown some variation across different conditions; nonetheless, women utilizing medicine generally demonstrated more favorable beliefs. Epilepsy was the condition in which less disparities were noted between women who were medicated and those who were not [22].

Recent study results suggest a generally positive level of knowledge, attitude, and practice regarding medication use during pregnancy. However, there was also resistance and a hindering attitude toward using medications during this period. The study revealed a gap in the knowledge provided by healthcare professionals, emphasizing the need for improvements to enhance the safety and effectiveness of medication use during pregnancy [23].

An analysis of three databases indicated that most research documented patient misunderstandings regarding prescription medications during pregnancy. The primary source of information favored was a healthcare provider, however informal sources of information also had considerable popularity [24].

The growing use of herbal medications among pregnant women represents a significant public health concern. Recent studies have revealed a prevalent belief that herbal remedies are safer than conventional medications, leading many pregnant women to prefer these natural products over pharmaceutical options during pregnancy. This trend highlights the need for a comprehensive understanding of pregnant women's beliefs and perceptions regarding medication use, as these factors play a crucial role in shaping their healthcare decisions. Despite potential risks to both mother and fetus, many pregnant women continue to use herbal medicines [25],[26],[27].

Research on this topic in Libya remains particularly scarce. To date, only two studies have examined pregnant women's perceptions of medication use in the country. The first study conducted by Abdurrauf M. Khalf and colleagues in 2019, this study focused on pregnant women's attitudes toward over-the-counter medications in Azzawia. The findings indicated significant distrust in the safety of both non-prescription drugs (92%) and herbal products (86%) among participants [28]. In 2021, Saeid Miftah and others concluded that most women had a positive attitude toward medications in general but they believed pregnant women should be more cautious regarding drug use during pregnancy. [29]

However, these studies provide limited insight into medication perceptions among Libya's broader pregnant population. Therefore, the current study aims to assess the Medication use during Pregnancy and Breastfeeding: Awareness and Perceptions among Libyan Women.

## METHODS

### Study Design

This study employed a cross-sectional design utilizing a self-administered online questionnaire. Data were collected from participants across various regions of Libya between September 2024 and March 2025.

### Inclusion Criteria and Exclusion Criteria:

The study's eligibility criteria included Libyan females aged 18 years and above who are pregnant or have been pregnant before, breastfeeding or have been breastfeeding before. Participants who did not complete the questionnaire or did not agree to participate will be excluded.

### Data Collection Instrument and Procedures:

A validated questionnaire from a previous study was adopted for this research [1]. The questionnaire comprised four main sections including Demographics information, followed by Medication Use Patterns, perceptions question towards assessing the use of Medication during pregnancy, herbal medicine safety, and received need for medications. Lastly, the questionnaire cover question related the sources of information on medication-related advice. The scientific structural questionnaire was professionally translated into Arabic language to ensure transparency for the target population. Data collection was conducted via Google Forms, and the questionnaire was distributed through social media platforms (WhatsApp, Facebook, and Telegram). All collected data were anonymized and used solely for research purposes. Participants provided informed consent prior to participation, and ethical approval was obtained before study began.

**Sample Size:**

The sample size was calculated based on Cochran’s Sample Size formula according to an estimated prevalence of pregnancy in Libya [30]. The proportion of the population which has the attribute in question was calculated based on A Reproductive Health Tool by Centre for Disease Control and Prevention-USA. [31]. The calculated sample size was 227 among the study population.

**Data Analysis:**

The collected data was entered into a Microsoft Excel file and later transferred to SPSS 25.0 version (IBM Inc., Chicago, USA) statistical software for further analysis. The mean ± SD was reported for continuous variables, while categorical variables were described using frequencies and percentages. A Chi-square test was used to compare categorical variables. Adjustment for specific covariates was calculated by ANOVA, p-value ≤ 0.05 was considered significant.

**Ethical Considerations**

The study was approved by the research ethics committee at the Libyan International University, Benghazi, Libya, on 18/11/2024, with certificate reference number MCP-202400252. The investigator asserts that all procedures contributing to this study comply with the ethical standards of the relevant national and institutional guidelines on human experimentation of Benghazi Medical Centre and with the Helsinki Declaration of 1975 and its later amendments.

**RESULTS**

**Characteristics of the Participants**

Two hundred twenty-seven pregnant women completed the questionnaire, achieving a 100% response rate. A total of 193 participants were included in the final analysis. Concerning age demographics, 15 (8%) of participants were aged 18-25 years, 78 (40%) were aged 26-35 years, 65 (34%) were aged 36-45 years, and 35 (18%) were over 45 years old. The participants' educational backgrounds were as follows: 139 (72%) held a bachelor's degree, 22 (11%) had completed public education, 29 (15%) had a postgraduate degree, and 3 (2%) were illiterate. Regarding parity, 162 (84%) were multiparous, while 31 (16%) were primiparous. In terms of medication usage, 18 (9%) used medications several times a week, 13 (7%) weekly, and 17 (9%) monthly. Meanwhile, 82 (43%) used medications infrequently, and 7 (4%) never used medications during pregnancy or breastfeeding. Women aged 18 to 35 were more likely to use medications weekly (p-value=0.001). Table 1 provides a detailed overview of the study participants' characteristics.

**Table 1: Characteristics of the study participants (n = 193)**

Variable	Category	Frequency	Percent
Age(years)	18-25	15	8
	26-35	78	40
	36-45	65	34
	45 <	35	18
Educational Level	Public education	22	11

	Bachelor's degree	139	72
	Postgraduate degree	29	15
	Illiterate	3	2
Parity	Multipara	162	84
	Primipara	31	16
Use of medication	Never	7	4
	Several times a week	18	9
	Once a week	13	7
	Once a month	17	9
	Rarely	82	43
	Daily	56	29

### Pregnant Women's Awareness about Medication Uses in Pregnancy

Of 158 of the participants (82%) had changed their views on drug use during pregnancy since they got pregnant, while 12 (6%) disagreed, and 22 (11%) didn't decide. Approximately 42 individuals (22%) disagreed with the notion that women should refrain from all pharmaceuticals during pregnancy, whereas 146 people (76%) concurred or partially concurred with this stance. Additionally, 5 participants (3%) expressed no view. A total of 54, representing 28%. Participants concurred that they generally utilize drugs more frequently during pregnancy; 132 (68%) disagreed, while 7 (4%) remained neutral. Of the participants, 139 (72%) concurred or somewhat concurred that the use of drugs during pregnancy is more detrimental than beneficial, 46 (24%) disagreed, and 8 (4%) expressed no view. A total of 190 individuals (98%) concurred or partially concurred that they would adhere to treatment if offered drugs during pregnancy, while 2% disagreed. 67% agreed /partially agreed to prioritize their health over fetal health, while 29% disagreed, and 4% were neutral (Table 2).

**Table 2: Pregnant women's awareness about medication uses in pregnancy in general (n = 193)**

Statement	Agree/Partly Agree, N (%)	Disagree/Partly Disagree, N (%)	No Opinion, N (%)
My view of medication use during pregnancy has changed since I became pregnant	158 (82)	12 (6)	22 (11)
Pregnant women should avoid all kinds of medication	146 (76)	42 (22)	5 (3)
I tend to use medication when I'm pregnant more than I tend to use medication when I'm not	54 (28)	132 (68)	7 (4)
Using medication during pregnancy does more harm than good	139 (72)	46 (24)	8 (4)
If prescribed medication during pregnancy, I will stick to the treatment	190 (98)	3 (2)	0 (0)
Women's health is prioritized when medication is used during pregnancy over the health of the fetus	129 (67)	56 (29)	8 (4)

**Pregnant Women's Perceptions About Medication Use in Pregnancy and Breastfeeding** A total of 161 women (83%) believes that the use of medication during early pregnancy is harmful or potentially harmful, while 32 women (17%) think it may not be harmful or could be safe. 167 individuals (86%) believe that medication usage during nursing is, or may be, detrimental to the kid, while 26 individuals (13%) believe that pharmaceuticals are not, or may not be, harmful. 62% believe that using herbal medicine during late pregnancy is hazardous or potentially harmful, while 38% consider it harmless or probably harmless. Women aged 26-45 and those possessing a bachelor's degree significantly perceive herbal medicine as safe ( $p$ -value = 0.017, 0.001), however women with postgraduate degrees do not (Table 3). Nineteen people (10%) with Asthma/Allergy required and utilized drugs, whereas seven persons (4%) abstained from their utilization. A total of 34 people (18%) required paracetamol throughout pregnancy but abstained from its use, whereas 89 participants (46%) utilized it. A total of 23 individuals (12%) required drugs for heartburn and gastritis but abstained from utilizing them, while 105 individuals (54%) required and utilized the medications. Approximately 45 individuals (23%) required medications for chronic pain and used them during pregnancy, while 29 individuals (15%) chose not to use them. Seventy-nine participants (41%) needed medications for headaches or migraines and used them, whereas 35 participants (18%) required the prescriptions but abstained from using them. Around 75 participants (39%) required antibiotics and used them during pregnancy, while 33 participants (17%) needed antibiotics but chose not to use them. Participants with public education and bachelor's degrees showed a significantly higher tendency to use asthma/allergy medications when needed ( $p$ -value = 0.001, 0.03, respectively). Table 4 and Figure 1 illustrate pregnant women's perceptions of medication use in relation to the necessity of the medicine.

**Table 3: Pregnant women's perceptions about medication and herbal medicines' uses in pregnancy and breastfeeding (n = 193)**

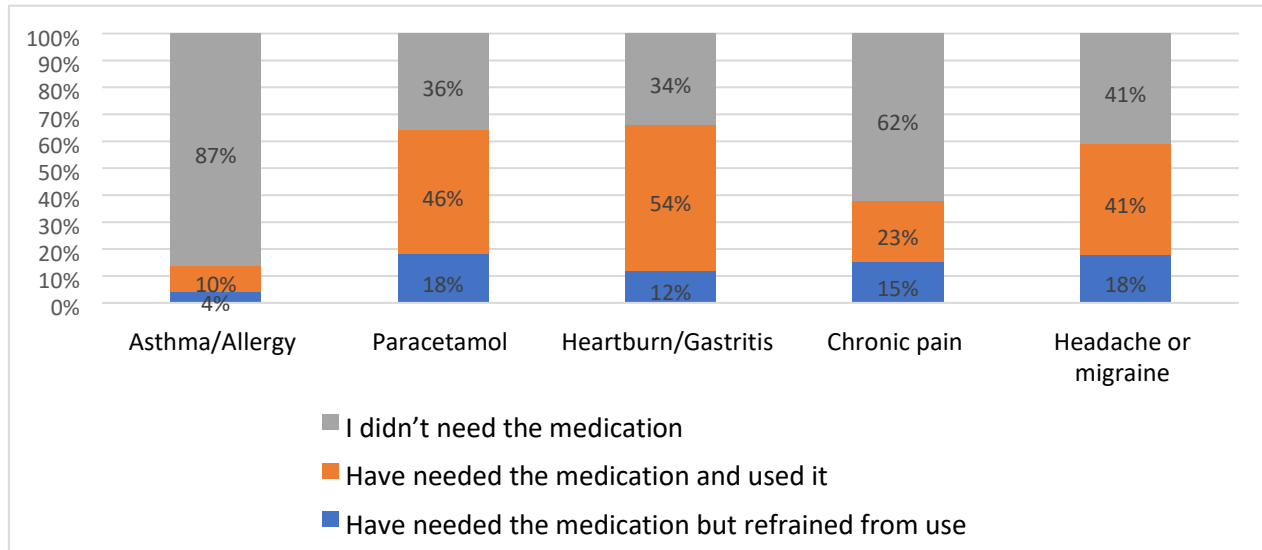
Statement	Harmful/ Probably harmful n (%)	Harmless/ Probably harmless n (%)	p- value
What are your perceptions about medication use during early pregnancy (1st trimester)?	161 (83%)	32 (17%)	0.000
What are your perceptions about medication use during breastfeeding and the effect on the child?	167 (86%)	26 (13%)	0.000
What are your perceptions about herbal medicine use during late pregnancy (2nd & 3rd trimesters)?	80 (41%)	103 (59%)	0.07

**Table 4: Pregnant women's perceptions about medication use in relation to the need for the medication (n = 193)**

Need to use the following medications while Pregnant or breastfeeding?	Have needed the medication but refrained from use	Have needed the medication and used it	I didn't need the medication
Asthma/Allergy	7 (4)	19 (10)	167 (87)
Paracetamol	34 (18)	89 (46)	70 (36)

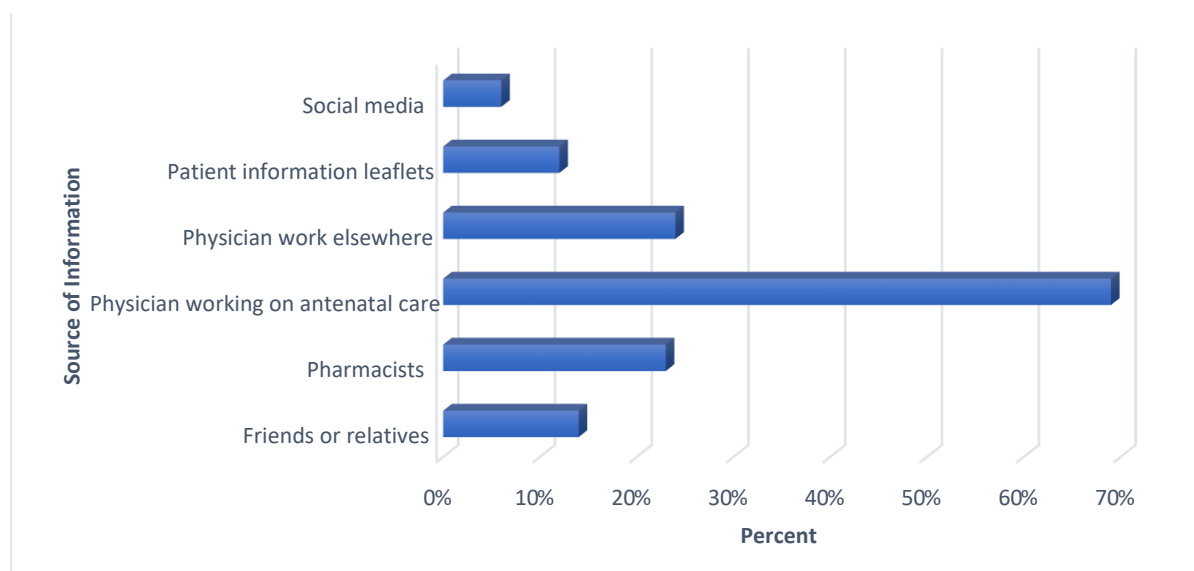


Heartburn/Gastritis	23 (12)	105 (54)	65 (34)
Chronic pain	29 (15)	45 (23)	119 (62)
Headache or migraine	35 (18)	79 (41)	79 (41)
Antibiotics	33 (17)	75 (39)	85 (44)



**Figure 1: Pregnant women's perceptions about medication use in relation to the need for the medication**

Of 134 participants (69%) stated that they would consult the physician responsible for antenatal care if they had concerns about certain medications during pregnancy. Additionally, 24 participants (12%) would refer to patient information leaflets, 44 (23%) would ask the pharmacist, 12 (6%) would seek information online or via social media, 27 (14%) would consult friends or family, and 47 (24%) would consult a physician at a different location (Figure 2).



**Figure 2: The source of information regarding medication uses during pregnancy.**

## DISCUSSION

The use of medication during pregnancy and breastfeeding is a critical health issue, making it essential to raise awareness and improve perceptions among pregnant and breastfeeding women regarding the rationale for using medications and supplements. Understanding women's perceptions of medication use and the associated risks during pregnancy is vital, as many pregnant women experience medical conditions that require specific pharmaceuticals. A woman's perspective on medication significantly influences her decisions, which in turn affects her experience with certain health issues. This study aimed to assess the awareness and perceptions of medication use during pregnancy and breastfeeding among women in Libya.

38% of participants reported daily or frequent medication use, while 42% indicated infrequent use during pregnancy or breastfeeding. These results align with findings from a 2022 study conducted in Saudi Arabia [20].

Younger women (aged 18-35) are more likely to use medications weekly ( $p\text{-value}=0.001$ ), emphasizing the importance of understanding pregnant women's attitudes toward medication use to provide informed counseling. Previous research has shown that women, in general, tend to be more cautious about using medications during pregnancy [32].

A large proportion of women in the study changed their ideas on medication consumption during pregnancy, preferring to eschew all pharmaceuticals and showing reduced usage compared to non-pregnant intervals. This emphasizes the awareness of medicine hazards and confirms the necessity for thorough counseling when treatment is needed for maternal or fetal health.

In our study, approximately 72% of pregnant women agreed that the use of drugs during pregnancy or lactation posed risks and led to more harm than benefit. These results surpass those documented by Namshah A et al [20]. This finding is also consistent with a study conducted in Sweden, where more than 50% of pregnant women believed that taking medications during the first and last trimesters or while breastfeeding was either dangerous or potentially harmful [33].

Individuals with postgraduate education perceive herbal remedies as detrimental during early pregnancy. A study conducted in Saudi Arabia indicated that pregnant women with limited educational attainment exhibited greater comfort in utilizing herbal and/or natural remedies during their pregnancies, believing that prior consultation with a physician was unnecessary [34]. Previous studies have similarly shown that women with lower educational attainment perceived the use of herbal medicines as more hazardous compared to their counterparts with higher educational levels [35].

Approximately two-thirds (67%) of the women acknowledged that women's health is emphasized over fetal health when medicine is administered during pregnancy. This underscores the importance of providing pregnant women with accurate and unbiased information regarding the potential effects of medications on fetal health. Consequently, any concerns or questions about these issues should be carefully addressed and resolved. These findings are consistent with those of the Swedish study [33]. This was also in line with the

findings from a similar study conducted in the Netherlands, where the most common maternal concern was having a child with congenital disabilities [36].

A study conducted online with 210 pregnant women indicated that 36.2% exhibited low adherence to treatment. Insufficient compliance with the treatment regimen during pregnancy was predominantly influenced by preexisting beliefs about medications [37]. Nevertheless, an overwhelming majority of patients in our study (98%) demonstrate robust drug adherence. The correlation between age and perceptions of herbal medicine usage was significant with younger women and those with public education and bachelor's degrees perceiving the use of herbal medicines during pregnancy as less dangerous than older women. Prior studies on the Saudi population showed the majority of women frequently regard drugs as nondetrimental [34].

Women with postgraduate education did not agree with the opinion that herbal medicines are harmless. This trend may reflect a greater awareness among postgraduate women regarding the potential risks associated with the use of herbal medicines during pregnancy. This includes a more informed understanding of the lack of regulations, possible adverse effects, and potential interactions with conventional medications. Additionally, 46% of our participants reported using paracetamol, compared to 82% in the study by Namshah A et al. (2022) in Saudi Arabia. The FDA classifies paracetamol as category B, indicating it is generally deemed safe for use during pregnancy. In our study, 54% and 39% of participants said they used heartburn/gastritis and antibiotic medications when needed, respectively, compared to 74% and 72% in the Saudi study. Given that hyperacidity and infections are common during pregnancy, Libyan women need proper education regarding the safety of these medications during pregnancy.

The pregnant women in our study appeared to favor obtaining information regarding medication use from physicians in prenatal care facilities. This will likely result in improved adherence to treatment plans. The majority of women in our survey preferred professional information sources, such as physicians, over informal sources like the internet and acquaintances. These findings are consistent with research conducted in Sweden, Ethiopia, and Saudi Arabia [33],[20],[38].

The primary strength in this study is our ability to explore women's viewpoints regarding their drug use during pregnancy. This facilitates the comparison of attitudes and actual drug utilization during pregnancy. Libya exhibits relatively high internet penetration rates at 88%, rendering online questionnaire more feasible than in countries with less everyday online access [39]. Furthermore, employing an anonymous online questionnaire can significantly enhance the likelihood of obtaining honest and uninhibited responses, particularly when addressing delicate or personal topics. This approach is especially advantageous in the context of Libyan society, where conservative religious and cultural norms may discourage open discussion of certain issues in face-to-face settings. By preserving participants' anonymity and providing a private, judgment-free environment, this method not only promotes authenticity in responses but also broadens access, enabling the inclusion of a more diverse and representative segment of Libyan women who might otherwise be reluctant or unable to participate in traditional data collection methods. However, there are several limitations that should be considered. First, the extent to which our findings can be generalized to the broader population depends on how

representative the respondents are of the general birthing population in Libya. In many questionnaire-based studies, participants tend to be somewhat more resourceful than the general population, which means our findings may underestimate the actual prevalence of medication use during pregnancy. Another limitation is the underrepresentation of illiterate women, which may impact the generalizability of the findings. Future research should consider incorporating additional data collection methods to better capture the awareness and perceptions of this particular group.

## CONCLUSION

The use of medications and herbal remedies among pregnant and breastfeeding women varies and is influenced by several factors. Despite this, many women have negative perceptions of certain prescriptions. The vast majority of pregnant women get consultation from physicians and pharmacists about medication-related issues throughout pregnancy and lactation. A notable association has been noticed among age, educational attainment, and women's perceptions of the safety of medications and herbal therapies all through these intervals. It is advisable to enhance initiatives aimed at educating women and motivating them to obtain information regarding drug use during pregnancy as well as breastfeeding from reliable sources. We encourage national health sectors to design programs to enhance awareness and eliminate misconceptions around medication and supplements in pregnancy. Moreover, extensive study involving considerable sample sizes is essential for investigating the impact of drugs on mothers and children during pregnancy and breastfeeding.

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## Declaration of Competing Interest

The authors have no relevant financial or non-financial interests to disclose.

## References

- [1] E. Wolgast, L. Lindh-Åstrand, and C. Lilliecreutz, "Women's perceptions of medication use during pregnancy and breastfeeding—A Swedish cross-sectional questionnaire study," *Acta Obstet. Gynecol. Scand.*, vol. 98, no. 7, pp. 856–864, 2019, doi: 10.1111/aogs.13570.
- [2] S. F. Widnes and J. Schjøtt, "Risk perception regarding drug use in pregnancy," *Am. J. Obstet. Gynecol.*, vol. 216, no. 4, pp. 375–378, 2017, doi: 10.1016/j.ajog.2016.12.007.
- [3] M. Feghali, R. Venkataramanan, and S. Caritis, "Pharmacokinetics of drugs in pregnancy," *Semin. Perinatol.*, vol. 39, no. 7, pp. 512–519, Nov. 2015, doi: 10.1053/J.SEMPERI.2015.08.003.
- [4] J. H. Kim and A. R. Scialli, "Thalidomide: The Tragedy of Birth Defects and the Effective Treatment of Disease," *Toxicol. Sci.*, vol. 122, no. 1, pp. 1–6, Jul. 2011, doi: 10.1093/toxsci/kfr088.
- [5] A. A. M. Alosaimi, S. M. Zamzam, D. J. E. Berdida, and H. N. Villagrancia, "Perceived risks of over-the-counter medication use among pregnant Saudi mothers: A cross-sectional study," *J. Taibah Univ. Med. Sci.*, vol. 17, no. 5, p. 755, Oct. 2022, doi: 10.1016/J.JTUMED.2022.03.001.
- [6] J. L. Carey, N. Nader, P. R. Chai, S. Carreiro, M. K. Griswold, and K. L. Boyle, "Drugs and Medical Devices: Adverse Events and the Impact on Women's Health," *Clin. Ther.*, vol. 39, no. 1, p. 10, Jan. 2017, doi: 10.1016/J.CLINTHERA.2016.12.009.
- [7] E. D. Weld, T. C. Bailey, and C. Waitt, "Ethical issues in therapeutic use and research in pregnant and breastfeeding women," *Br. J. Clin. Pharmacol.*, vol. 88, no. 1, pp. 7–21, 2022, doi: 10.1111/bcp.14914.

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- [8] Y. G. Tefera, B. M. Gebresillassie, A. Getnet Mersha, and S. A. Belachew, "Beliefs and Risk Awareness on Medications Among Pregnant Women Attending the Antenatal Care Unit in Ethiopia University Hospital. Overestimating the Risks Is Another Dread," *Front. Public Heal.*, vol. 8, p. 464611, Mar. 2020, doi: 10.3389/FPUBH.2020.00028/BIBTEX.
- [9] A. A. M. Alosaimi, S. M. Zamzam, D. J. E. Berdida, and H. N. Villagrancia, "Perceived risks of over-the-counter medication use among pregnant Saudi mothers: A cross-sectional study," *J. Taibah Univ. Med. Sci.*, vol. 17, no. 5, p. 755, Oct. 2022, doi: 10.1016/J.JTUMED.2022.03.001.
- [10] A. A. M. Alosaimi, S. M. Zamzam, D. J. E. Berdida, and H. N. Villagrancia, "Perceived risks of over-the-counter medication use among pregnant Saudi mothers: A cross-sectional study," *J. Taibah Univ. Med. Sci.*, vol. 17, no. 5, pp. 755–764, 2022, doi: 10.1016/j.jtummed.2022.03.001.
- [11] M. C. Brucker and T. L. King, "The 2015 US Food and Drug Administration Pregnancy and Lactation Labeling Rule," *J. Midwifery Womens. Health*, vol. 62, no. 3, pp. 308–316, May 2017, doi: 10.1111/JMWH.12611.
- [12] B. O'Brien and Q. Zhou, "Variables Related to Nausea and Vomiting During Pregnancy," *Birth*, vol. 22, no. 2, pp. 93–100, Jun. 1995, doi: 10.1111/J.1523-536X.1995.TB00566.X.
- [13] W. Alhamdan *et al.*, "Knowledge regarding teratogens among women of childbearing age at a large tertiary care center in Saudi Arabia," *J. Fam. Med. Prim. Care*, vol. 9, no. 6, p. 3088, 2020, doi: 10.4103/JFMPC.JFMPC\_173\_20.
- [14] Punam Sachdeva, B. G. Patel, and B. K. Patel, "Drug Use in Pregnancy; a Point to Ponder!," *Indian J. Pharm. Sci.*, vol. 71, no. 1, pp. 1–7, 2009.
- [15] J. Sanders, R. Blaylock, C. Dean, I. Petersen, H. Trickey, and C. Murphy, "Women's experiences of over-the-counter and prescription medication during pregnancy in the UK: findings from survey free-text responses and narrative interviews," *BMJ Open*, vol. 13, no. 3, pp. 1–9, 2023, doi: 10.1136/bmjopen-2022-067987.
- [16] G. Koren and Z. Levichek, "The teratogenicity of drugs for nausea and vomiting of pregnancy: perceived versus true risk," *Am. J. Obstet. Gynecol.*, vol. 186, no. 5 Suppl Understanding, 2002, doi: 10.1067/MOB.2002.122601.
- [17] N. M. Zaki and A. A. Albarraq, "Use, attitudes and knowledge of medications among pregnant women: A Saudi study," *Saudi Pharm. J. SPJ Off. Publ. Saudi Pharm. Soc.*, vol. 22, no. 5, pp. 419–428, Nov. 2014, doi: 10.1016/J.JSPS.2013.09.001.
- [18] M. J. Twigg, A. Lupattelli, and H. Nordeng, "Women's beliefs about medication use during their pregnancy: a UK perspective," *Int. J. Clin. Pharm.*, vol. 38, no. 4, pp. 968–976, 2016, doi: 10.1007/s11096-016-0322-5.
- [19] H. Nordeng, G. Koren, and A. Einarson, "Pregnant women's beliefs about medications--a study among 866 Norwegian women," *Ann. Pharmacother.*, vol. 44, no. 9, pp. 1478–1484, Sep. 2010, doi: 10.1345/APH.1P231.
- [20] N. A. Alhajri *et al.*, "Women's Perceptions of Medication Use During Pregnancy and Breastfeeding in Saudi Arabia," *Cureus*, vol. 14, no. 12, p. e32953, Dec. 2022, doi: 10.7759/cureus.32953.
- [21] O. C. Obi and C. Anosike, "A cross-sectional study on the knowledge, attitude, and practice of pregnant women regarding medication use and restriction during pregnancy.," *Explor. Res. Clin. Soc. Pharm.*, vol. 11, no. June, p. 100308, 2023, doi: 10.1016/j.rcsop.2023.100308.
- [22] S. Roldan Munoz, A. Lupattelli, S. T. De Vries, P. G. M. Mol, and H. Nordeng, "Differences in medication beliefs between pregnant women using medication, or not, for chronic diseases: A cross-sectional, multinational, web-based study," *BMJ Open*, vol. 10, no. 2, pp. 1–11, 2020, doi: 10.1136/bmjopen-2019034529.
- [23] A. Almuhareb, A. Al Sharif, and P. Cahusac, "Knowledge, attitude, and practice of medication use among pregnant women in Riyadh City: a cross-sectional study," *Front. Glob. Women's Heal.*, vol. 5, no. July, pp. 1–13, 2024, doi: 10.3389/fgwh.2024.1402608.
-

- [24] A. Kirubarajan *et al.*, "Knowledge, Information Sources, and Institutional Trust of Patients Regarding Medication Use in Pregnancy: A Systematic Review," *J. Fam. Reprod. Heal.*, vol. 15, no. 3, 2021, doi: 10.18502/jfrh.v15i3.7133.
- [25] Y. Quzmar, Z. Istiatieh, H. Nabulsi, S. H. Zyoud, and S. W. Al-Jabi, "The use of complementary and alternative medicine during pregnancy: a cross-sectional study from Palestine," *BMC Complement. Med. Ther.*, vol. 21, no. 1, pp. 1–10, 2021, doi: 10.1186/s12906-021-03280-8.
- [26] A. Bouquoufi, L. Lahlou, F. Ait El Hadj, M. Abdessadek, M. Obtel, and Y. Khabbal, "Prevalence, motivation, and associated factors of medicinal herbs consumption in pregnant women from Eastern Mediterranean Regional Office: a systematic review," *Pharm. Biol.*, vol. 61, no. 1, pp. 1065–1081, 2023, doi: 10.1080/13880209.2023.2229388.
- [27] D. M. Alkhalidi and S. S. Alkhamash, "Prevalence, knowledge, and attitudes toward herbal medicines among pregnant women attending antenatal clinic in Prince Mansour Military Hospital in Taif," *J. Fam. Med. Prim. Care*, vol. 12, no. 7, pp. 1446–1453, Jul. 2023, doi: 10.4103/JFMPC.JFMPC\_295\_23.
- [28] A. Khalf, A. Eshwika, S. Al-sharif, and S. Saad, "Evaluation of Pregnant Women Attitude Toward OTC Medications Use ; A cross Sectional Study Conducted in Azawia Libya Evaluation of Pregnant Women Attitude Toward OTC Medications Use ; A cross Sectional Study Conducted in Azawia Libya," vol. 6, no. August 2022, pp. 238–243, 2019.
- [29] R. Saeid, M. Mashathi, and \ Assistant, "Knowledge, Attitudes, and Uses of Medications during Pregnancy among Pregnant Women at El-Marj City," 2021, Accessed: Jun. 19, 2025. [Online]. Available: <https://repository.uob.edu.ly/handle/123456789/1530>
- [30] D. Machin, M. J. Campbell, S. B. Tan, and S. H. Tan, *Sample Size Tables for Clinical Studies*. Oxford, UK: WileyBlackwell, 2008. doi: 10.1002/9781444300710.
- [31] CDC, "Estimating the Number of Pregnant Women in a Geographic Area: A Reproductive Health Tool", Accessed: Mar. 05, 2025. [Online]. Available: <https://www.cdc.gov/reproductivehealth/media/files/Pregnant-Population-Size-Estimator->
- [32] H. Nordeng, G. Koren, and A. Einarson, "Pregnant Women's Beliefs About Medications—A Study Among 866 Norwegian Women," *Ann. Pharmacother.*, vol. 44, no. 9, pp. 1478–1484, Sep. 2010, doi: 10.1345/APH.1P231.
- [33] E. Wolgast, L. Lindh-Åstrand, and C. Lilliecreutz, "Women's perceptions of medication use during pregnancy and breastfeeding—A Swedish cross-sectional questionnaire study," *Acta Obstet. Gynecol. Scand.*, vol. 98, no. 7, pp. 856–864, Jul. 2019, doi: 10.1111/AOGS.13570.
- [34] N. M. Zaki and A. A. Albarraq, "Use, attitudes and knowledge of medications among pregnant women: A Saudi study," *Saudi Pharm. J.*, vol. 22, no. 5, pp. 419–428, Nov. 2014, doi: 10.1016/J.JSPS.2013.09.001.
- [35] M. J. Twigg, A. Lupattelli, and H. Nordeng, "Women's beliefs about medication use during their pregnancy: a UK perspective," *Int. J. Clin. Pharm.*, vol. 38, no. 4, pp. 968–976, Aug. 2016, doi: 10.1007/S11096-0160322-5/TABLES/4.
- [36] B. Mulder *et al.*, "Risks versus benefits of medication use during pregnancy: what do women perceive?," *Patient Prefer. Adherence*, vol. 12, pp. 1–8, Dec. 2017, doi: 10.2147/PPA.S146091.
- [37] A. Lupattelli, O. Spigset, and H. Nordeng, "Adherence to medication for chronic disorders during pregnancy: Results from a multinational study," *Int. J. Clin. Pharm.*, vol. 36, no. 1, pp. 145–153, Oct. 2014, doi: 10.1007/S11096-013-9864-Y/METRICS.
- [38] Y. G. Tefera, B. M. Gebresillassie, A. Getnet Mersha, and S. A. Belachew, "Beliefs and Risk Awareness on Medications Among Pregnant Women Attending the Antenatal Care Unit in Ethiopia University Hospital. Overestimating the Risks Is Another Dread," *Front. Public Heal.*, vol. 8, p. 464611, Mar. 2020, doi: 10.3389/FPUBH.2020.00028/BIBTEX.
- [39] "Digital 2024: Libya — DataReportal – Global Digital Insights." Accessed: Apr. 14, 2025. [Online]. Available: <https://datareportal.com/reports/digital-2024-libya>