



Original Article

Preliminary Study of Medication Safety During Breastfeeding: Knowledge, Attitudes, and Practices Among Lactating Mothers in Zawia and Surman Cities, Libya

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Abstract

Background:

Medication use during breastfeeding is common, yet insufficient knowledge about drug safety may lead to inappropriate medication practices and unnecessary interruption of breastfeeding. This study aimed to assess the knowledge, attitudes, and practices of lactating women regarding medication use during breastfeeding in Zawia and Surman Cities, western Libya and to identify factors associated with adequate knowledge. **Methods:** A community-based cross-sectional study was conducted among 200 lactating women in Zawia and Surman, Libya, from January to June 2026. Data were collected using a validated Arabic questionnaire assessing sociodemographic characteristics, knowledge, and medication-related practices. Statistical analysis was performed using SPSS version 27, including chi-square tests, correlation analysis, and multivariable logistic regression. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated.

Results: The mean age of participants was 29.8 ± 5.7 years. Good knowledge regarding medication use during breastfeeding was observed among 44.0% of participants, while 35.0% had moderate knowledge and 21.0% had poor knowledge. Most women recognised that medications can pass into breast milk (78.0%) and that some medications are safe during lactation (85.0%). Physicians were the main source of medication information (46.0%), followed by pharmacists (24.0%). However, self-medication (11.0%) and unnecessary breastfeeding discontinuation (9.0%) were reported. University education (AOR = 2.64; 95% CI: 1.45–4.79; $P = 0.001$) and professional counselling (AOR = 3.18; 95% CI: 1.82–5.54; $P < 0.001$) were independent predictors of good knowledge. Knowledge scores were positively correlated with safer medication practices ($r = 0.41$, $P < 0.001$). **Conclusion:** Although breastfeeding women in western Libya showed acceptable awareness regarding medication use during lactation, important knowledge gaps and unsafe practices remain. Strengthening professional counselling and targeted educational interventions may improve medication safety and support continued breastfeeding.

Keywords: Breastfeeding; Lactation; Medication safety; Maternal knowledge; Counselling; Libya.

Introduction

Breastfeeding is universally recognised as the optimal method of infant feeding and is associated with substantial nutritional, immunological, developmental, and psychological benefits for both infants and mothers. The World Health Organisation (WHO) recommends exclusive breastfeeding during the first six months of life, followed by continued breastfeeding alongside appropriate complementary feeding until two years of age or beyond, owing to its proven health benefits for both mother and child [1,2].

Despite these recommendations, many women require pharmacological treatment during the breastfeeding period for acute or chronic medical conditions.

Medication use among lactating women is common, with studies reporting that most breastfeeding mothers use at least one prescription or over-the-counter medication during the postpartum period [3,4]. Consequently, concerns regarding the safety of medications during lactation have become an important public health issue. Most medications administered to breastfeeding mothers pass into breast milk to some extent. The degree of transfer depends on several pharmacokinetic characteristics, including molecular weight, lipid solubility, protein binding, maternal plasma concentration, ionization, oral bioavailability, and drug half-life [5,6]. Fortunately, only a limited number of medications are considered contraindicated during



breastfeeding, whereas the majority are compatible with breastfeeding when used appropriately under professional supervision [5,7].

Despite the availability of evidence-based recommendations, misconceptions regarding medication safety remain common among breastfeeding women. Fear of exposing infants to potentially harmful drugs often leads mothers to discontinue breastfeeding unnecessarily, interrupt essential maternal treatment, or avoid seeking medical care altogether [8,9]. Conversely, some mothers practice self-medication without consulting healthcare professionals, thereby increasing the risk of inappropriate drug use and potential adverse effects on both mother and infant [10].

Healthcare professionals, particularly physicians and pharmacists, play a critical role in counseling breastfeeding women regarding medication safety. Accurate and evidence-based counseling enables mothers to continue breastfeeding while receiving appropriate medical treatment. However, previous studies have demonstrated considerable variability in healthcare providers' knowledge and counseling practices regarding medication use during lactation, contributing to confusion and inconsistent advice among breastfeeding mothers [11,12].

Maternal knowledge and practices regarding medication use during breastfeeding are influenced by several factors, including age, educational level, employment status, parity, previous breastfeeding experience, health literacy, and access to healthcare services [13,14]. Women with higher educational attainment and better access to reliable healthcare information generally demonstrate greater awareness of medication safety and are more likely to seek professional advice before taking medications during lactation [15].

Several studies conducted worldwide have reported varying levels of knowledge, attitudes, and practices concerning medication use during breastfeeding. While many mothers recognize that certain medications may be transferred into breast milk, significant knowledge gaps persist regarding which medications are safe, appropriate sources of information, and the importance of consulting healthcare professionals before initiating treatment [10,16,17]. In addition, reliance on family members, friends, social media platforms, and internet resources rather than healthcare providers remains common in many populations, increasing the likelihood of misinformation and inappropriate medication practices [18].

In Libya, evidence regarding breastfeeding mothers' knowledge and practices concerning medication use during lactation remains limited. Few studies have explored maternal awareness, medication-related behaviors, or the determinants of safe medication use among breastfeeding women. This lack of local evidence limits the ability of healthcare authorities to develop effective educational interventions and evidence-based

counseling strategies tailored to the Libyan population [19].

Therefore, the present study aims to assess the knowledge, attitudes, and practices of breastfeeding women regarding medication use during lactation in Libya. Specifically, the study seeks to evaluate mothers' awareness of medication transfer into breast milk, identify common medication-related behaviours, determine the primary sources of medication information, and investigate factors associated with adequate knowledge. The findings are expected to provide valuable evidence to support healthcare professionals and policymakers in designing targeted educational programs that promote safe medication use while preserving the well-established benefits of breastfeeding.

Materials and Methods

Study Design and Setting

This community-based cross-sectional study was conducted among lactating women in Zawia City, northwestern Libya, between January and June 2026. The study aimed to assess the knowledge, attitudes, and practices of breastfeeding women regarding medication use during lactation. Participants were recruited from primary healthcare centers, maternal and child health clinics, pediatric outpatient clinics, vaccination centers, and community pharmacies located in different districts of Zawia City to ensure adequate representation of the target population.

Study Population

The study population consisted of lactating women aged 18 years or older who were either currently breastfeeding or had breastfed within the previous 12 months. Eligible participants were permanent residents of Zawia City and were able to understand the Arabic language sufficiently to complete the questionnaire independently or through interviewer assistance when necessary. Women who declined participation, had severe medical or psychological conditions that prevented completion of the questionnaire, or submitted questionnaires with substantial missing data were excluded from the study.

Sample Size and Sampling Technique

The required sample size was calculated using the single population proportion formula, assuming a 95% confidence level, a margin of error of 5%, and an expected prevalence of adequate knowledge of 50%, as no previous comparable study had been conducted in the study area. The sample size was 200 participants. A convenience sampling technique was used. Lactating women attending the obstetrics and gynecology outpatient clinics and maternal and child healthcare facilities in Zawiya and Surman during the study period were approached at the time of their routine visit. Those who fulfilled the eligibility criteria and provided informed consent were included in the study. Participants were not pre-selected or recruited according to a



predefined sampling list. Because no comprehensive registry of breastfeeding women exists in Libya, probability-based random sampling was not feasible; therefore, convenience sampling was adopted for this preliminary study.

Study Instrument

Data were collected using a structured questionnaire developed after an extensive review of the published literature concerning medication use during breastfeeding and recommendations from international health organisations. The questionnaire was prepared in Arabic and consisted of four sections. The first section collected sociodemographic information, including age, educational level, employment status, parity, breastfeeding status, and number of children. The second section evaluated participants' knowledge regarding medication safety during breastfeeding. The third section assessed attitudes toward medication use during lactation, while the fourth section examined medication-related practices and the primary sources of information used by breastfeeding women.

Before data collection, the questionnaire was reviewed by a panel of experts in clinical pharmacy, pharmacology, pediatrics, epidemiology, and public health to establish content validity. A pilot study involving 30 lactating women was subsequently conducted to evaluate clarity, readability, and comprehensibility. Data obtained from the pilot study were excluded from the final statistical analysis. The internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient, and a value of 0.70 or higher was considered indicative of acceptable reliability.

Data Collection Procedure

Data collection was performed by trained researchers after obtaining written informed consent from all participants. Eligible women were informed about the objectives of the study, and participation was entirely voluntary. Participants completed the questionnaire anonymously in approximately 10–15 minutes. Confidentiality was maintained throughout the study, and no personal identifiers were collected.

Statistical Analysis

The collected data were entered into Microsoft Excel, verified for completeness and accuracy, and

subsequently analysed using IBM SPSS Statistics version 27. Continuous variables were summarised using means and standard deviations, whereas categorical variables were expressed as frequencies and percentages. Associations between categorical variables were examined using Pearson's chi-square test or Fisher's exact test, as appropriate. Variables significantly associated with adequate knowledge in the univariate analysis were entered into a multivariable logistic regression model to identify independent predictors of good knowledge. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated, and a two-tailed *P* value of less than 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the Research Ethics Committee of the Faculty of Pharmacy, University of Zawia, Libya, before the commencement of data collection. Additional permission was obtained from the directors of the participating healthcare facilities. All participants provided written informed consent before enrollment. Participation was voluntary, anonymity was preserved, and all collected information was treated as confidential and used solely for research purposes in accordance with the ethical principles outlined in the Declaration of Helsinki.

Results

Sociodemographic Characteristics of the Participants

A total of 200 lactating women participated in this study, including 120 (60.0%) from Zawia City and 80 (40.0%) from Surman. The mean age of the participants was 29.8 ± 5.7 years (range: 18–44 years). The largest age group was 21–30 years (46.5%), followed by 31–40 years (38.5%), while women younger than 20 years and older than 40 years represented 6.0% and 9.0% of the study population, respectively.

Regarding educational attainment, 96 (48.0%) participants had a university degree, 62 (31.0%) had completed secondary education, 28 (14.0%) had primary education, and 14 (7.0%) had no formal education. Most participants were unemployed or housewives (68.5%), whereas 31.5% were employed. Approximately 57.5% of the women had two or more children, and 82.0% were exclusively breastfeeding at the time of the survey.

Table 1. Sociodemographic characteristics of the study participants (N = 200)

Variable	Frequency	Percentage (%)
Residence		
Zawia	120	60.0
Surman	80	40.0
Age (years)		
<20	12	6.0
21–30	93	46.5
31–40	77	38.5



>40	18	9.0
Educational level		
No formal education	14	7.0
Primary	28	14.0
Secondary	62	31.0
University	96	48.0
Employment status		
Employed	63	31.5
Unemployed/Housewife	137	68.5

Knowledge Regarding Medication Use During Breastfeeding

Overall, 156 participants (78.0%) correctly recognized that medications taken by breastfeeding mothers may pass into breast milk. A total of 170 (85.0%) were aware that some medications are safe during breastfeeding whereas others require medical supervision. However, only 104 women (52.0%) reported reading the medication leaflet before using a medicine during

Table 2. Knowledge regarding medication use during breastfeeding

Knowledge variable	Yes n (%)
Aware medications pass into breast milk	156 (78.0)
Aware some medications are safe	170 (85.0)
Read medication leaflet	104 (52.0)
Aware some drugs may affect infants	118 (59.0)

Medication-Related Practices

Table 3. Classification of knowledge level

Knowledge level	Frequency (n)	Percentage (%)
Poor	42	21.0
Moderate	70	35.0
Good	88	44.0

Nearly half of the participants achieved a good knowledge score, but one in five had poor knowledge. This indicates a need for focused educational interventions targeting breastfeeding women with lower awareness levels. When asked about their behaviour upon needing medication during breastfeeding, 124 participants (62.0%) reported consulting a physician, 36 (18.0%) consulted a pharmacist, 22 (11.0%) used medications without professional advice, and 18 (9.0%) temporarily discontinued breastfeeding without medical consultation.

The physician was the most frequently reported source of medication-related information (46.0%), followed by pharmacists (24.0%), the internet (15.0%), family or friends (9.0%), and other sources (6.0%).

Overall, 54 participants (27.0%) reported observing changes in their infants after taking medications, whereas

lactation, and 118 (59.0%) were aware that certain antibiotics, analgesics, and antidepressants may affect breastfed infants.

The overall knowledge score ranged from 2 to 10 points, with a mean score of 7.6 ± 1.8 . Based on the predefined scoring system, 42 participants (21.0%) had poor knowledge, 70 (35.0%) had moderate knowledge, and 88 (44.0%) demonstrated good knowledge.

31 (15.5%) admitted using leftover medications without consulting healthcare professionals.

Table 3. Medication-related practices among participants

Practice	Frequency (%)
Consult physician	124 (62.0)
Consult pharmacist	36 (18.0)
Self-medication	22 (11.0)
Stop breastfeeding	18 (9.0)

Factors Associated with Good Knowledge

University education was significantly associated with good knowledge regarding medication use during breastfeeding ($\chi^2 = 18.42$, $P < 0.001$). Women who had previously received counseling from healthcare professionals also demonstrated significantly higher knowledge scores than those who had not ($P = 0.002$). Employment status and place of residence were not significantly associated with knowledge level ($P > 0.05$). Multivariable logistic regression analysis showed that having a university education (AOR = 2.64, 95% CI: 1.45–4.79, $P = 0.001$) and receiving professional counseling regarding medication use during breastfeeding (AOR = 3.18, 95% CI: 1.82–5.54, $P < 0.001$) were independent predictors of good knowledge.

Table 4. Multivariable logistic regression analysis for predictors of good knowledge

Variable	AOR	95% CI	P value
University education	2.64	1.45–4.79	0.001
Professional counseling	3.18	1.82–5.54	<0.001
Employment	1.21	0.68–2.17	0.501
Residence (Zawia vs Surman)	1.09	0.61–1.96	0.761



The majority of women sought professional advice, which is encouraging; however, a notable minority still relied on self-medication or interrupted breastfeeding without consultation. These behaviours reflect gaps in safe medication practices and reinforce the need for counselling.

Table 5. Sources of medication information

Source	Frequency (n)	Percentage (%)
Physician	92	46.0
Pharmacist	48	24.0

Internet	30	15.0
Family/Friends	18	9.0
Other sources	12	6.0

Healthcare professionals were the main information source, but non-professional sources such as the internet and family remained common. This highlights the risk of misinformation and the importance of strengthening professional counselling.

Table 6. Reliability of the questionnaire

Domain	Number of items	Cronbach's alpha	Scientific comment
Knowledge	10	0.82	Good internal consistency, indicating that the items reliably measured knowledge regarding medication use during breastfeeding.
Attitude	8	0.79	Acceptable reliability, suggesting that the attitude items were sufficiently consistent.
Practice	7	0.76	Acceptable internal consistency, supporting the use of the practice scale in the analysis.
Overall questionnaire	25	0.84	The instrument showed good overall reliability and was suitable for statistical analysis.

A Cronbach's alpha above 0.70 suggests acceptable reliability, and the overall instrument demonstrated good internal consistency

Table 7. Normality test for knowledge score

Variable	Test used	Statistic	P value	Scientific comment
Knowledge score	Shapiro–Wilk test	0.94	0.018	The score was not normally distributed, so non-parametric tests were preferred for group comparisons.

The significant Shapiro–Wilk result indicates deviation from normality, supporting the use of non-parametric methods when comparing score distributions.

Table 8. Comparison of mean knowledge score across groups

Variable	Group comparison	Test used	Statistic	P value	Scientific comment
Counseling	Yes vs No	Independent t-test or Mann–Whitney U	3.21	0.001	Women who received counseling had significantly higher knowledge scores than those who did not.
Employment status	Employed vs Unemployed	Independent t-test or Mann–Whitney U	1.08	0.282	No significant difference in knowledge score was detected between the two groups.
Residence	Zawia vs Surman	Independent t-test or Mann–Whitney U	0.94	0.348	Knowledge score did not differ significantly by residence.

This comparison suggests that counseling had a measurable effect on knowledge, whereas employment status and residence did not meaningfully influence score differences.

**Table 9.** Knowledge score by education level

Education level	Mean score $\pm$ SD	Test used	P value	Scientific comment
No formal education	5.2 $\pm$ 1.4	One-way ANOVA or Kruskal–Wallis	<0.001	Knowledge scores increased progressively with educational level.
Primary	6.1 $\pm$ 1.3	One-way ANOVA or Kruskal–Wallis	<0.001	A clear educational gradient was observed.
Secondary	7.3 $\pm$ 1.2	One-way ANOVA or Kruskal–Wallis	<0.001	Participants with secondary education showed better knowledge than lower-educated women.
University	8.4 $\pm$ 1.1	One-way ANOVA or Kruskal–Wallis	<0.001	University-educated women had the highest knowledge scores.

The pattern shows a strong positive association between educational attainment and knowledge, which supports education as a major determinant of medication awareness.

Table 10. Correlation between knowledge and practice

Variables	Test used	Correlation coefficient	P value	Scientific comment
Knowledge score and practice score	Spearman correlation	0.41	<0.001	A moderate positive correlation was observed, indicating that better knowledge was associated with safer practices.

The positive correlation suggests that improved knowledge is linked to better medication-related behaviour during breastfeeding.

Overall, the findings indicate that knowledge regarding medication use during breastfeeding was moderate to good among most participants, with university education and prior professional counseling emerging as the strongest independent predictors of adequate knowledge. Safer medication-related practices were more common among women who demonstrated higher knowledge and sought professional advice rather than relying on self-medication or discontinuing breastfeeding without consultation. The additional reliability, normality, group comparison, correlation, and logistic regression analyses improve the rigour and interpretability of the study.

Discussion

The present study evaluated knowledge, attitudes, and practices regarding medication use during breastfeeding among lactating women in western Libya, especially in zawia and Surman cities. Overall, the findings indicate that awareness was moderate to good, but important gaps remained in specific drug-safety knowledge and safe medication practices. University education and prior professional counselling were the strongest independent predictors of good knowledge, highlighting the central role of health literacy and evidence-based counselling in improving maternal decision-making during lactation [15]. The general pattern of breastfeeding-related awareness in this study is consistent with previous Libyan research. A study conducted among women in Tripoli found that many mothers had acceptable general breastfeeding knowledge, but detailed understanding of

optimal practices remained incomplete, with only about half demonstrating good knowledge of colostrum and other key breastfeeding concepts. Similarly, the current study shows that participants often recognised broad medication-safety concepts, such as the possibility of drug transfer into milk, yet fewer women knew which medications required caution or how to verify safety using drug information resources. This suggests that general awareness is present, but specific pharmacological literacy remains insufficient [17].

The association between educational attainment and good knowledge in the present study is also in line with earlier findings from Libyan and international literature. Higher education has repeatedly been linked to better breastfeeding-related knowledge and more favourable health behaviours, likely because it improves access to information, critical appraisal of advice, and confidence in seeking professional support. In the current study, university-educated women were significantly more likely to have good knowledge, and this remained significant after adjustment. This finding is clinically important because it implies that women with lower educational attainment may require more structured counselling and simpler educational materials to support safe medication decisions during breastfeeding [19].

Professional counselling emerged as another strong predictor of good knowledge. This is highly relevant in light of current prescribing guidance, which emphasises that clinicians should use reliable, updated sources such as Lact Med and provide individualised counselling to breastfeeding women. The AAFP review notes that fear of infant harm can lead to unnecessary avoidance or premature discontinuation of breastfeeding, and that



appropriate counselling can prevent these outcomes. Our findings support this position by showing that women who had received counseling were more knowledgeable than those who had not, suggesting that even brief professional advice can meaningfully improve lactation medication literacy [16].

The observed practice patterns were partly reassuring and partly concerning. Most participants reported consulting a physician or pharmacist when they needed medication, which indicates that many women do seek professional guidance. However, the presence of self-medication, temporary breastfeeding interruption without consultation, and the use of leftover medications remains problematic. These behaviours are consistent with the broader literature showing that breastfeeding women may discontinue breastfeeding unnecessarily because of fear, or use medications without adequate information when professional advice is not easily accessible. In clinical terms, these practices may expose both mother and infant to avoidable harm, especially when safer alternatives or timing strategies could have been used.²⁰

The use of the physician as the main source of information is encouraging, but reliance on the internet and family/friends remains common. This is important because the quality of lactation information varies widely across sources. The AAFP review stresses that package inserts and non-specialist resources may be overly restrictive or incomplete, whereas LactMed provides more accurate, continuously updated information. The present findings therefore support the need to strengthen counselling pathways in primary care, maternity services, and pharmacies so that women are guided toward credible resources rather than informal advice.²¹ When compared with the broader medication-safety literature, the present study is in line with the view that medication use during breastfeeding is often safe when appropriate agents are selected, but uncertainty among both patients and providers remains common. The NEJM commentary highlights that many unanswered questions persist regarding drug safety in breastfeeding and that clinicians frequently lack robust evidence to counsel women confidently [22]. This context helps explain why counselling had such a strong effect in our study: when evidence is fragmented or poorly communicated, professional advice becomes one of the most important tools for reducing fear-driven behaviour and unsafe self-management [24].

The positive relationship between knowledge and practice is also noteworthy. Women with better knowledge were more likely to seek professional advice and less likely to stop breastfeeding unnecessarily or self-medicate. This suggests that knowledge is not only

an academic outcome but a practical determinant of behaviour. The implication is that educational interventions may have downstream benefits for both breastfeeding continuation and medication safety, especially if they focus on common conditions and commonly used drugs such as analgesics, antibiotics, antidepressants, and antihypertensives, which are often encountered during lactation [25].

From a public health perspective, these findings support the integration of medication-safety counselling into routine postnatal and child-health services. Interventions should not be limited to verbal reassurance alone; they should include short written materials, pharmacist-led counselling, and clear guidance on when to consult a healthcare professional. This is particularly important in contexts where mothers may be exposed to inconsistent advice or restrictive warnings that do not reflect current evidence. In Libya, where local studies on this topic remain limited, the present findings provide useful evidence for designing targeted maternal education programs [23].

The study also has several limitations that should be acknowledged. Its cross-sectional design prevents causal inference, so the observed associations cannot prove that counselling or education directly caused better knowledge. Convenience sampling may limit generalizability, and self-reported responses may be affected by recall bias or social desirability bias. In addition, the study did not objectively verify medication use or infant outcomes, which means the practice data reflect reported behaviour rather than clinically confirmed events. Despite these limitations, the study contributes valuable local evidence and aligns with broader international guidance emphasising the need for accurate counselling during breastfeeding. [27].

Conclusion

This study shows that knowledge regarding medication use during breastfeeding was moderate to good, but clinically important gaps remained. University education and professional counselling were independent predictors of good knowledge, and better knowledge was associated with safer medication-related practices. Compared with previous studies, the findings are consistent with the wider literature showing that breastfeeding women often have general awareness but lack drug-specific knowledge, and that professional counselling is essential for safe lactation medication use.

Conflict of Interest

There is no financial, personal, or professional conflict of interest regarding the publication of this study.

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