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Original article

Knowledge and Attitude Towards Breastfeeding Among Female Paramedical Students

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Abstract
Breastfeeding provides substantial health benefits for mothers and infants, and health-professional students are expected to acquire adequate knowledge and supportive attitudes toward breastfeeding. However, gaps in knowledge and attitudes may affect their future ability to promote and support breastfeeding. This study aimed to assess breastfeeding knowledge and attitudes among female students at the College of Medical Technology in Derna, Libya, and to examine their association with selected sociodemographic and educational characteristics. This cross-sectional study was conducted among 146 female students at the College of Medical Technology in Derna, Libya. Data were collected using a structured, self-administered questionnaire developed by the researchers. The questionnaire assessed sociodemographic characteristics, breastfeeding knowledge, and attitudes toward breastfeeding. Knowledge items were scored as correct or incorrect/don't know and categorised into poor, moderate, and good levels. Attitudes were assessed using a five-point Likert scale, with negatively worded items reverse-scored. Attitude scores were initially categorised as unfavourable, moderate/neutral, and favourable. Most participants had moderate knowledge of breastfeeding (61.0%), while 19.9% had poor knowledge and 19.1% had good knowledge. Knowledge was particularly high regarding the general benefits of breastfeeding, including breast milk as the ideal food for infants (98.0%), strengthening the mother–infant bond (98.6%), and better overall health of breastfed infants (95.2%). However, important gaps were identified regarding breastfeeding in public (12.3% correct) and breastfeeding after returning to work (36.3% correct). Regarding attitudes, 66.4% had a moderate/neutral attitude, 31.5% had an unfavourable attitude, and only 2.1% had a favourable attitude. No significant associations were found between knowledge level and attitude with age (p=0.205-0.189), academic year (p=0.537-0.396), or previous receipt of breastfeeding information (p=0.269-0.495). Knowledge level was also not significantly associated with attitude toward breastfeeding (χ^2=0.436, p=0.804). In conclusion, female medical technology students demonstrated good awareness of the general benefits of breastfeeding but had important gaps in practical and socially sensitive aspects of breastfeeding. Our findings support the need for structured breastfeeding education that addresses not only factual knowledge but also practical breastfeeding support and social barriers, particularly breastfeeding in public and continuation after returning to work.
Keywords. Breastfeeding; Knowledge; Attitude; Female Students; Health Professions Education; Medical Technology Students; Libya.

Introduction

Breastfeeding is a key component of maternal and child health and provides infants with essential nutrients and bioactive components that support growth and development during early life. It also provides important protection against infectious diseases and other common childhood illnesses, while offering health benefits to mothers. Consequently, promoting breastfeeding is an important component of preventive and primary health care and contributes substantially to improving maternal and child health outcomes [1,2]. The World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) recommend initiation of breastfeeding within the first hour after birth, exclusive breastfeeding during the first six months of life, followed by the introduction of safe and nutritionally adequate complementary foods while breastfeeding continues up to two years of age [1,3].

Despite the well-established benefits of breastfeeding and international recommendations supporting optimal breastfeeding practices, breastfeeding outcomes remain influenced by multiple factors. Mothers may encounter difficulties related to breastfeeding initiation and continuation, including inadequate knowledge, conflicting advice, social expectations, embarrassment about breastfeeding in public, concerns about returning to work, and misconceptions about the adequacy or duration of breastfeeding. Such factors highlight that successful breastfeeding promotion requires more than providing information; it requires an enabling environment and consistent, evidence-based support for women and their families [2,3]. Health professionals have an important role in creating such an environment. Their knowledge, attitudes, communication skills, and ability to provide practical breastfeeding support may influence mothers' decisions to initiate and continue breastfeeding.

Health professionals may also help women distinguish evidence-based recommendations from commonly held misconceptions and cultural beliefs. Consequently, adequate preparation of future health professionals should be considered an important element of breastfeeding promotion [4,5]. However, evidence indicates that health-professional students do not always receive sufficient education and training to provide effective breastfeeding support. A systematic review of breastfeeding knowledge and attitudes among health-professional students reported considerable variation in students' knowledge and attitudes, with important deficiencies in areas related to breastfeeding assessment,

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management, and practical support. The review also indicated that specialised breastfeeding education can improve students' knowledge and attitudes [4].

More recent evidence has reinforced the importance of structured educational interventions. A systematic review and meta-analysis published in 2023 found that breastfeeding educational interventions improved knowledge, attitudes, and skills among nursing, midwifery, and medical students, with skills laboratories and clinical practicums providing additional benefits beyond lectures alone [5]. The educational preparation of health-professional students is therefore an important opportunity for breastfeeding promotion. Undergraduate students represent the future health workforce and may subsequently interact with women before pregnancy, during antenatal care, at childbirth, and throughout the postpartum period. However, breastfeeding education within health-professional curricula is not necessarily standardised. A scoping review of lactation education for undergraduate health students found considerable variation in educational resources, teaching methods, and curricular approaches. Although several educational programs were associated with improvements in students' knowledge and attitudes, consistency in breastfeeding education across health disciplines was not evident [6]. These findings suggest that assessing students' existing knowledge and attitudes is an important first step in identifying educational needs and designing appropriate interventions.

The relationship between knowledge and attitudes is particularly relevant among female students preparing for careers in health care. Female health-professional students may eventually provide breastfeeding counselling and support to mothers while also becoming potential mothers themselves. Their perceptions may therefore influence both their future professional practice and their personal understanding of breastfeeding [4]. Evidence from Libya also highlights the importance of strengthening breastfeeding knowledge and support within the health system. A cross-sectional study conducted among healthcare professionals at Aljalaa Maternity Hospital in Tripoli found that, although participants demonstrated adequate knowledge in several areas of breastfeeding initiation, duration, and complementary feeding, important knowledge gaps remained. The authors concluded that healthcare professionals had fair overall breastfeeding knowledge and emphasised the need for training and continuing education to improve breastfeeding support [7]. More recent research among Libyan women in Tripoli has likewise examined breastfeeding knowledge, attitudes, practices, and factors influencing breastfeeding, indicating continuing interest in breastfeeding as an important maternal and child health issue in the Libyan context [8].

In addition, UNICEF data indicate that early initiation of breastfeeding remains an important area for improvement in Libya, with an estimated 29% of newborns being breastfed within the first hour after birth [9]. These findings underscore the need to strengthen breastfeeding-related knowledge and support across the healthcare system and to prepare future health professionals to provide accurate, evidence-based information to mothers and families. In addition to formal education, students may acquire information about breastfeeding through informal social networks. The influence of such networks may be particularly relevant when students have limited access to structured breastfeeding education or practical experience. A study of medical interns and residents in Lebanon found that some participants relied on informal, non-professional networks, including mothers, partners, and sisters, for breastfeeding-related knowledge and practices, highlighting the role of social relationships in shaping breastfeeding beliefs and learning [10]. Furthermore, a systematic review of health-professional students identified exposure to breastfeeding, personal experience, and sociocultural influences as factors associated with students' breastfeeding knowledge and attitudes [4].

Consequently, assessing not only students' factual knowledge but also their perceptions and beliefs may help identify misconceptions and educational needs that should be addressed during undergraduate health-professional training. Although international literature has increasingly examined breastfeeding knowledge and attitudes among health-professional students, evidence from Libya remains limited, particularly among students enrolled in medical technology and other paramedical programs. Assessing these students is relevant because graduates of such programs constitute part of the future health workforce and may have opportunities to influence maternal and child health through health education and interaction with women and families. Therefore, the present study was conducted among female students at the College of Medical Technology in Derna, Libya, to assess their knowledge and attitudes toward breastfeeding and to identify areas of knowledge and perception that may require further educational attention. The findings may provide a baseline for strengthening breastfeeding-related education within health-professional training and may contribute to the development of culturally appropriate strategies for preparing future health workers to support optimal breastfeeding practices.

Methods

A descriptive cross-sectional study was conducted among female students enrolled at the Faculty of Medical Technology, Derna, Libya. The study included students from different academic years within the faculty and aimed to assess their knowledge and attitudes toward breastfeeding. The study population comprised female students enrolled at the Faculty of Medical Technology in Derna. A total of 146 female students participated in the study. Participants were recruited from the different academic years of the faculty. The required sample size was calculated using the formula for estimating a single population proportion:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where n is the required sample size, Z is the standard normal deviate corresponding to a 95% confidence level (1.96), P is the expected proportion, and d is the desired margin of error. Assuming an expected proportion of 50% and a margin of error

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of approximately 8.1%, the calculated minimum sample size was approximately 146 participants. Accordingly, 146 female students were recruited and included in the study. A convenience sampling technique was used to recruit eligible female students who were available during the data-collection period and willing to participate in the study. Eligible students were approached and invited to complete the self-administered questionnaire after providing informed consent. Data were collected using a structured, self-administered questionnaire developed by the researchers to assess female students' knowledge and attitudes toward breastfeeding.

The questionnaire consisted of three sections. The first section collected participants' sociodemographic and academic characteristics, including age, academic year, and other relevant background information. The second section assessed knowledge about breastfeeding using 14 knowledge items. Each item had a single correct response, with an incorrect response or "don't know" response considered incorrect. The third section assessed attitudes toward breastfeeding using nine statements rated on a five-point Likert scale ranging from "strongly agree" to "strongly disagree," covering perceptions of the benefits of breastfeeding, prolonged breastfeeding, breastfeeding in public, social support, family roles, and the compatibility of breastfeeding with women's careers. The questionnaire was self-developed based on the study objectives and the domains intended to be assessed. As no definitive previously validated instrument was identified for the specific study population and objectives, the questionnaire was developed specifically for this study. Knowledge and attitude scores were calculated separately according to the predefined scoring procedures described below. Knowledge scoring: Each knowledge item was scored as 1 for a correct response and 0 for an incorrect response or "don't know" response. The total knowledge score ranged from 0 to 14, with higher scores indicating better knowledge.

Based on modified Bloom's cutoff points, knowledge was categorised as poor (<60%), moderate (60–79%), or good (≥80%) of the maximum attainable score, corresponding to scores of 0–8, 9–11, and 12–14, respectively. This scoring system was applied in another KAP study (11). Attitude scoring: Attitudes toward breastfeeding were assessed using nine statements rated on a five-point Likert scale ranging from strongly agree to strongly disagree. Positively worded items were scored from 5 for strongly agree to 1 for strongly disagree. Negatively worded items were reverse-scored, with strongly agree assigned 1 point and strongly disagree assigned 5 points. Reverse-scored items were items 2,3,7,8,9 The total attitude score ranged from 9 to 45, with higher scores indicating a more favourable attitude toward breastfeeding. Initially, attitude scores were categorised as unfavourable (<60%), moderate/neutral (60–79%), and favourable (≥80%) of the maximum attainable score, corresponding to scores of 9–26, 27–35, and 36–45, respectively. Because only three participants (2.1%) were classified as having a favourable attitude, the moderate/neutral and favourable categories were combined for inferential analysis, resulting in two categories: unfavourable and neutral/favorable.

The content and clarity of the questionnaire were reviewed by two experts with relevant academic expertise, and their feedback was considered in revising the questionnaire. A pilot study was subsequently conducted on a small group of participants to assess the clarity, comprehensibility, and applicability of the questionnaire and to identify any necessary modifications before the main data collection. Participants included in the pilot study were not included in the final study sample. Data were coded, entered, and analysed using IBM SPSS Statistics. Categorical variables were summarised as frequencies and percentages, while quantitative variables were summarised using appropriate measures of central tendency and dispersion.

For the knowledge assessment, each correct response was assigned one point, whereas incorrect and "don't know" responses were assigned zero points. The total knowledge score ranged from 0 to 14 and was categorised into poor, moderate, and good knowledge according to the predefined cutoff points. Attitude items were scored on a five-point Likert scale after reverse-scoring negatively worded statements. The total attitude score ranged from 9 to 45. For inferential analysis, attitude was categorised into two groups: unfavourable and neutral/favorable. Associations between categorical variables were assessed using the Pearson chi-square test. Where appropriate, the distribution of knowledge and attitude levels was compared across participants' age groups, academic years, and previous receipt of breastfeeding information. The association between knowledge level and attitude toward breastfeeding was also assessed. A p-value <0.05 was considered statistically significant. The study was conducted in accordance with the ethical principles governing research involving human participants. Ethical approval was obtained from the Medical Technology College ethics committee before commencement of the study. All participants were informed about the purpose and procedures of the study, and participation was voluntary. Written informed consent was obtained from all participants before completion of the questionnaire. Participants were informed that they had the right to decline participation or withdraw from the study at any time without any consequences. Confidentiality and anonymity of the collected data were maintained throughout the study, and the information obtained was used solely for research purposes.

Results

Table 1 presents the sociodemographic and academic characteristics of the participating female students and their sources of breastfeeding information. Of the 146 participants, nearly half were aged 18–<21 years (49.3%), while 50.7% were aged 21–27 years. The majority were single (89.0%). Regarding college departments, the largest proportion were first-year students in the unspecialized program (34.2%), followed by students in Medical Care (18.5%) and Drug Technology (15.8%). The distribution across academic years showed that first-year students constituted the largest proportion (34.2%), followed by fourth-year (28.8%), third-year (19.2%), and second-year students (17.8%). Most participants (79.5%) reported having received information about breastfeeding, whereas 20.5% had not. Among the 116 students who reported receiving breastfeeding information, relatives and friends were the most frequently reported source (51.7%), followed by the studied

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curriculum (24.1%) and social media (20.7%). Healthcare workers, including physicians and nurses, were reported by 15.5% of participants, while traditional mass media such as television, radio, books, and magazines were the least frequently reported source (7.8%). As participants could select more than one source, the percentages for sources of information do not sum to 100%.

Table 1. Sociodemographic Characteristics and Sources of Breastfeeding Information among Female Students at the College of Medical Technology, Derna

Variables	n	%
Age		
18-<21	72	49.3
21-27	74	50.7
Marital status		
Single	130	89.0
Married	16	11.0
College Departments		
First year (unspecialized)	50	34.2
Public health	11	7.5
Radiology	4	2.7
Drug technology	23	15.8
Genetic	5	3.4
Medical care	27	18.5
Dental technology	18	12.3
Lab medicine	8	5.5
Academic year	50	34.2
1st	26	17.8
2nd	28	19.2
3rd	42	28.8
4th		
Received information about Breastfeeding		
Yes	116	79.5
No	30	20.5
Source(s) of information*		
Relatives/friends	60	51.7
Studied curriculum	28	24.1
Social media	24	20.7
Healthcare workers (physicians/ nurses)	18	15.5
Traditional mass media (TV, radio, books or magazines)	9	7.8

** Among the 116 participants who reported sources of information, participants could select more than one source; therefore, percentages do not sum to 100%. Percentages were calculated using 116 participants as the denominator.*

Table 2 shows that the participants demonstrated good knowledge regarding several important aspects of breastfeeding. The highest proportions of correct responses were observed for recognising breast milk as the ideal food for babies (98.0%), the role of breastfeeding in strengthening the bond between mother and infant (98.6%), and the better overall health of breastfed babies compared with formula-fed babies (95.2%). Most participants also correctly recognised that breastfeeding is more convenient than formula feeding (94.5%), breast milk is easier to digest than formula (94.5%), breast milk is less expensive than formula (93.8%), and most participants (90.4%) correctly recognised the emotional and psychological benefits of breastfeeding for mothers. However, important knowledge gaps were identified in several areas; 12.3% correctly identified that mothers can breastfeed safely in public places.

Knowledge was also limited regarding continuation of breastfeeding among mothers returning to work, with only 36.3% answering correctly. Approximately half of the participants correctly recognised that formula-fed babies are more likely to be overfed and become obese than breastfed babies (50.0%). Knowledge was also relatively limited regarding the potential effect of breastfeeding on the mother's relationship with her partner, with 52.1% providing the correct response, and regarding the iron content of breast milk, with 58.9% answering correctly. Overall, although participants demonstrated good knowledge of the general benefits and practical advantages of breastfeeding, notable gaps remained regarding breastfeeding in public, breastfeeding among working mothers, and some specific maternal and infant health-related aspects of breastfeeding.

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Table 2. Distribution of Female Students According to Correct Responses to Breastfeeding Knowledge Items

Quires	Correct answer n (%)	Incorrect answer/ don't know n (%)
1 - The benefits of breastfeeding only last as long as the baby is breastfed	90 (61.6)	56 (38.4)
2 - Breastfeeding is generally more convenient than formula feeding because breast milk is readily available and requires no preparation.	138 (94.5)	8 (5.5)
3 - Breastfeeding increases the bond between mother and infant	144 (98.6)	2(1.4)
4 - Breast milk has low iron concentration	86 (58.9)	60 (41.1)
5. Babies who are fed formula are more likely to be overfed and obese than babies who are breastfed	73 (50.0)	73 (50.0)
6 - Mothers who plan to return to work can continue breastfeeding by expressing and storing breast milk for their babies.	53 (36.3)	93 (63.7)
7- Breastfeeding provides emotional and psychological benefits for mothers	132 (90.4)	14(9.6)
8 - Mothers can breastfeed their babies safely in public places.	18 (12.3)	128 (87.6)
9. Breastfed babies are healthier than formula-fed babies	139 (95.2)	7(4.8)
10. Babies who are breastfed are more likely to be overfed than babies who are formula-fed.	85(58.2)	61(41.8)
11. Breastfeeding can be continued without negatively affecting the mother's relationship with her partner.	76 (52.1)	70 (47.9)
12- Breast milk is the ideal food for babies.	143 (98.0)	3 (2.0)
13. Breast milk is easier to digest than formula.	138 (94.5)	8 (5.5)
14. Breast milk is less expensive than formula.	137 (93.8)	9 (6.2)

Table 3 shows that most participants (61.0%) demonstrated a moderate level of breastfeeding knowledge, whereas approximately one-fifth had poor knowledge (19.9%) and one-fifth had good knowledge (19.1%). However, (Table 4) shows that Knowledge level was not significantly associated with age group (p=0.205), academic year (p=0.537), or previous receipt of breastfeeding information (p=0.269). Moderate knowledge was the most common category across all age groups and academic years, as well as among students who had and had not previously received breastfeeding information.

Table 3. Distribution of Female Students According to Their Level of Knowledge About Breastfeeding

Knowledge level	n	%
Poor	29	19.9
Moderate	89	61.0
Good	28	19.1

Table 4. Association Between Knowledge Level About Breastfeeding and Selected Characteristics of Female Students (n=146)

	Poor level n=(29)		Moderate level n=(89)		Good level n=(28)		p- value	Test of sig
	n	%	n	%	n	%		
Age (years)								
18-<21	18	25	39	54.2	15	20.8	0.205	Chi Square X2 = 3.165
21-27	11	14.9	50	67.6	13	17.6		
Academic year								
1 st	10	20.0	32	64.0	8	16.0	0.537	Chi Square X2 = 5.056
2nd	6	23.1	17	65.4	3	11.5		
3rd	3	10.7	19	67.9	6	21.4		
4th	10	23.8	21	50	11	26.2		
Received information about breastfeeding								
Yes	20	17.2	73	62.9	23	19.8	0.269	Chi Square X2 = 2.438
No	9	30.0	16	53.3	5	16.7		

Percentages are row percentages.

Table 5 shows that participants expressed favourable attitudes toward several aspects of breastfeeding, particularly its benefits for infants and the societal responsibility to provide breastfeeding information. The most favourable attitudes were

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observed regarding breastfeeding as a source of comfort and security for the infant, with 89.1% agreeing or strongly agreeing, and the responsibility of society to provide information about breastfeeding, with 95.2% agreeing or strongly agreeing. Similarly, 86.3% agreed or strongly agreed that every child has the right to be breastfed and protected from hunger. In contrast, unfavourable attitudes were observed regarding some commonly held misconceptions. Nearly two-thirds of participants (65.1%) disagreed or strongly disagreed that mothers who breastfeed for more than one year become depleted and more susceptible to diseases, while 69.9% disagreed or strongly disagreed that prolonged breastfeeding may spoil or overindulge children. Regarding gender roles, 63.7% disagreed or strongly disagreed that a man undermines his role in the family by supporting his wife with breastfeeding. However, attitudes were less favourable toward breastfeeding in public places, with only 33.6% agreeing or strongly agreeing that mothers have the right to breastfeed their hungry babies in public and that this right should be respected. Similarly, 59.6% disagreed or strongly disagreed that a woman has to choose between her career and motherhood when she decides to breastfeed.

Table 5. Distribution of Female Students According to Their Attitudes Toward Breastfeeding

Quires	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Breastfeeding provides the infant with comfort and security in addition to satisfying hunger.	76(52.1)	54(37.0)	10(6.8)	6(4.1)	0(0.0)
2. Mothers who breastfeed for more than one year become depleted and more susceptible to diseases.	15(10.3)	36(24.7)	12(8.2)	63(43.2)	20(13.7)
3. Breastfeeding is only necessary in poor countries where children are dying of starvation.	5(3.4)	8(5.5)	6(4. 1)	70(47.9)	57(39.0)
4. It is the duty of society to provide information about the benefits of breastfeeding to every future parent.	99(67.8)	40(27.4)	7(4.8)	0(0.0)	0(0.0)
5. A mother has the right to breastfeed her hungry baby in public places, and this right should be respected.	20(13.7)	29(19.9)	22(15.1)	56(38.4)	19(13.0)
6. Every child has the right to breastfeed and to be protected from hunger.	73(50.0)	53(36.3)	15(10.3)	3(2.1)	2(1.4)
7. A man undermines his role in the family when he helps his wife at home and supports her in breastfeeding.	20(13.7)	20(13.7)	13(8.9)	49(33.6)	44(30.1)
8. Mothers who breastfeed for more than one year are at risk of spoiling or overindulging their children.	12(8.2)	22(15.1)	10(6.8)	68(46.6)	34(23.3)
9. When a woman decides to breastfeed, she has to choose between her career and motherhood.	15(10.3)	30 (20.5)	14(9.6)	68(46.6)	19(13.0)

Table 6 indicates that 46 (31.5%) participants had an unfavourable attitude, 97 (66.4%) had a moderate/neutral attitude, and 3 (2.1%) had a favourable attitude. Table 7 shows that there was no statistically significant association between attitude toward breastfeeding and age group (p=0.189), academic year (p=0.396), or previous receipt of information about breastfeeding (p=0.495). A neutral/favorable attitude was more common than an unfavourable attitude across all age groups and academic years and among both students who had and had not previously received breastfeeding information.

Table 6. Distribution of Female Students According to Their Attitude Toward Breastfeeding

Attitude level	n	%
Unfavorable	46	31.5
Neutral to moderate	97	66.4
Favorable	3	2.1

For subsequent association analyses, the moderate/neutral and favourable categories were combined; consequently, 46 (31.5%) participants were classified as having an unfavourable attitude and 100 (68.5%) as having a neutral/favorable attitude.

Table 7. Association Between Attitude Toward Breastfeeding and Selected Characteristics of Female Students (n=146)

	Unfavorable attitude n=(46)		Neutral-favorable n=(100)		p- value	Test of sig
	n	%	n	%		
Age (years)						
18-<21	19	26.4	53	73.6	0.189	Chi Square X2 = 1.724
21-27	27	36.5	47	63.5		
Academic year						

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1 st	19	38	31	62	0.396	Chi Square X2 = 2.969
2nd	5	19.2	21	80.8		
3rd	8	28.6	20	71.4		
4th	14	33.3	28	66.7		
Received information about breastfeeding						
No	11	36.7	19	63.3	0.495	Chi Square X2 = 0.466
Yes	35	30.2	81	69.8		

Percentages are row percentages.

Table 8 shows that there was no statistically significant association between knowledge level and attitude toward breastfeeding (χ^2 = 0.436, p = 0.804). A neutral/favorable attitude was reported across all knowledge categories, ranging from 64.3% among students with good knowledge to 72.4% among those with poor knowledge.

Table 8. Association Between Knowledge Level and Attitude Toward Breastfeeding Among Female Students (n=146)

Knowledge level	Unfavorable attitude n=(46)		Neutral-favorable n=(100)		p- value	Test of sig
	n	%	n	%		
Poor	8	27.6	21	72.4	0.804	Chi Square X^2 = 0.436
Moderate	28	31.5	61	68.5		
Good	10	35.7	18	64.3		

Discussion

The present study assessed breastfeeding knowledge and attitudes among female students at the College of Medical Technology in Derna, Libya. Overall, participants demonstrated good knowledge of the general benefits of breastfeeding, but important gaps were identified in practical and socially sensitive aspects. Most participants had moderate knowledge (61.0%), while only 19.1% had good knowledge. Attitudes were predominantly moderate/neutral (66.4%), with 31.5% classified as unfavourable and only 2.1% as favourable. These findings indicate that awareness of the general value of breastfeeding does not necessarily translate into comprehensive knowledge or strongly favourable attitudes. Participants demonstrated particularly high knowledge regarding the general benefits of breastfeeding.

Almost all recognised breast milk as the ideal food for infants (98.0%), its role in strengthening the mother–infant bond (98.6%), and the better overall health of breastfed infants (95.2%). However, knowledge was considerably weaker regarding breastfeeding in public (12.3% correct), continuation of breastfeeding after returning to work (36.3%), and some specific maternal and infant health issues. This pattern is consistent with evidence among health-professional students showing that knowledge is often stronger regarding the general benefits of breastfeeding than regarding breastfeeding assessment, management, and practical support.

A systematic review found that health-professional students commonly demonstrated limited knowledge in these practical domains [4]. Similar deficiencies have been reported among nursing students in other settings [12]. The marked knowledge gap concerning breastfeeding in public is particularly noteworthy. Breastfeeding in public is influenced by social norms, cultural beliefs, embarrassment, stigma, and the wider social environment, rather than knowledge alone. A qualitative systematic review identified knowledge, beliefs, social environment, structural inequality, and legislation as major influences on women's experiences of breastfeeding in public [13]. In addition, a population survey found that acceptance of breastfeeding in public varied according to the setting, with lower acceptance in some public locations [14]. These findings suggest that breastfeeding education for future health professionals should address not only its nutritional and health benefits but also the social and practical barriers that women may encounter. The limited knowledge regarding breastfeeding after returning to work is also important. Health professionals need to understand practical strategies that support breastfeeding continuation when mothers resume employment.

Previous research among medical interns has demonstrated substantial baseline deficiencies in practical breastfeeding knowledge, including breast milk expression and breastfeeding management, while structured education significantly improved knowledge and attitudes [15]. More broadly, a systematic review and meta-analysis found that breastfeeding educational interventions significantly improved knowledge, attitudes, and breastfeeding skills among nursing, midwifery, and medical students, with clinical practicums providing additional benefits [16]. These findings support incorporating practical breastfeeding education into health-professional curricula. Regarding attitudes, the predominance of moderate/neutral attitudes in the present study is consistent with previous research among health-professional students. Ahmed and El Guindy reported neutral breastfeeding attitudes among Egyptian nursing students [17], while a systematic review found that students in several settings tended to have mid-range breastfeeding attitude scores [12]. Similar moderately positive attitudes have also been reported among nursing students and students from other university faculties [18].

Importantly, the present study identified less favourable attitudes toward breastfeeding in public: only 33.6% agreed or strongly agreed that mothers have the right to breastfeed a hungry baby in public and that this right should be respected. This finding complements the corresponding knowledge deficit and highlights the influence of social norms on

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breastfeeding attitudes. Evidence suggests that stigma, sexualization of the breast, embarrassment, and negative social expectations can discourage breastfeeding in public [14]. No statistically significant associations were found between knowledge level and age, academic year, or previous receipt of breastfeeding information. Likewise, attitude was not significantly associated with these characteristics. These findings suggest that simply progressing through academic years or having previously received some breastfeeding information may not be sufficient to produce comprehensive knowledge or strongly favourable attitudes. The source and quality of information may be more important than exposure alone. This is particularly relevant in the present study because relatives and friends were the most frequently reported source of breastfeeding information, followed by the curriculum and social media.

An important finding was the absence of a significant association between knowledge and attitude (χ^2=0.436, p=0.804). A neutral/favorable attitude was observed across all knowledge categories, and students with good knowledge were not more likely to have a favourable attitude than those with poor knowledge. This contrasts with findings among Egyptian nursing students, where knowledge and attitude were positively correlated [17]. Differences between studies may reflect variations in study populations, educational exposure, measurement instruments, and sociocultural context. The finding emphasises that breastfeeding education should extend beyond factual information and address beliefs, social norms, practical barriers, and confidence in providing breastfeeding support. The findings have important implications for health-professional education in Libya. The students showed strong awareness of the general benefits of breastfeeding, but substantial gaps remained in practical areas such as breastfeeding in public and continuation after returning to work. A structured curriculum that combines evidence-based knowledge with practical training, discussion of common misconceptions, and exposure to real-life breastfeeding challenges may therefore be more effective than relying on informal information or general curricular exposure. Evidence from educational interventions supports the effectiveness of structured breastfeeding education in improving knowledge, attitudes, and skills among future health professionals [16].

Strengths and limitations

This study assessed both knowledge and attitudes and explored their relationships with selected academic and informational characteristics. The questionnaire was reviewed by two experts and pilot-tested before the main study. However, the cross-sectional design limits causal interpretation, and the study was conducted among female students from a single College of Medical Technology, limiting generalizability. In addition, the questionnaire was self-developed and was not a previously validated standardised instrument, although expert review and pilot testing were undertaken. Self-reported responses may also have been affected by social desirability, particularly for attitudes concerning breastfeeding in public. Finally, the relatively small sample may have limited the power to detect modest associations.

Conclusion

In conclusion, female medical technology students demonstrated good awareness of the general benefits of breastfeeding but had important gaps in practical and social aspects of breastfeeding. Most participants had moderate knowledge and neutral attitudes, while only a small proportion demonstrated a clearly favourable attitude. The absence of significant associations between knowledge, attitude, and the assessed participant characteristics suggests a need for structured, comprehensive breastfeeding education that addresses both factual knowledge and the social and practical dimensions of breastfeeding.

Conflicts of Interest

The authors declare that they have no competing interests.

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