Knowledge, attitudes and future intentions towards breastfeeding among undergraduate students at a Jordanian public university

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Abstract

Background. The rates of breastfeeding in Jordan have decreased during the last few years, according to the last two Jordanian population and family health surveys. This decrease indicates a potential risk to the health of the infant and increases in the cost of healthcare for babies with more risk of infections. Studying the factors that affect intentions toward breastfeeding among young people who will become future parents may help to determine factors that impact on their decision making.
Aim. To describe students' knowledge, attitude, previous exposure and future infant feeding intentions.
Study design. A descriptive cross-sectional design was used. Data were collected using a structured self-administered questionnaire.
Participants. A sample of 418 undergraduate students attending a large university in the north of Jordan with a student population of 20,000.
Findings. The results of this study showed that students have adequate knowledge, a positive attitude and a high level of intent to breastfeed. Significant differences between males and females were reported, with males having more knowledge and a more positive attitude towards breastfeeding than females. Students of health majors had a higher knowledge about breastfeeding, and there was a significant correlation between attitude and knowledge toward breastfeeding among undergraduate non-health major students in the Jordan University of Science and Technology.
Implication. The results of the study provide new information about breastfeeding knowledge and attitudes among Jordanian higher education students. Further exploration of these attributes is necessary among the general population.

Key words: Breastfeeding, knowledge, attitudes, intention, student population, Jordan, evidence-based midwifery

Introduction

Despite all the benefits and recommendations about breastfeeding, breastfeeding rates are falling in countries, such as Brazil, Greece and Taiwan, and rising in others, such as the US and Australia (Abuhammad, 2016). The reasons for unstable trends in breastfeeding rates worldwide are associated with complex multi socio-cultural factors.

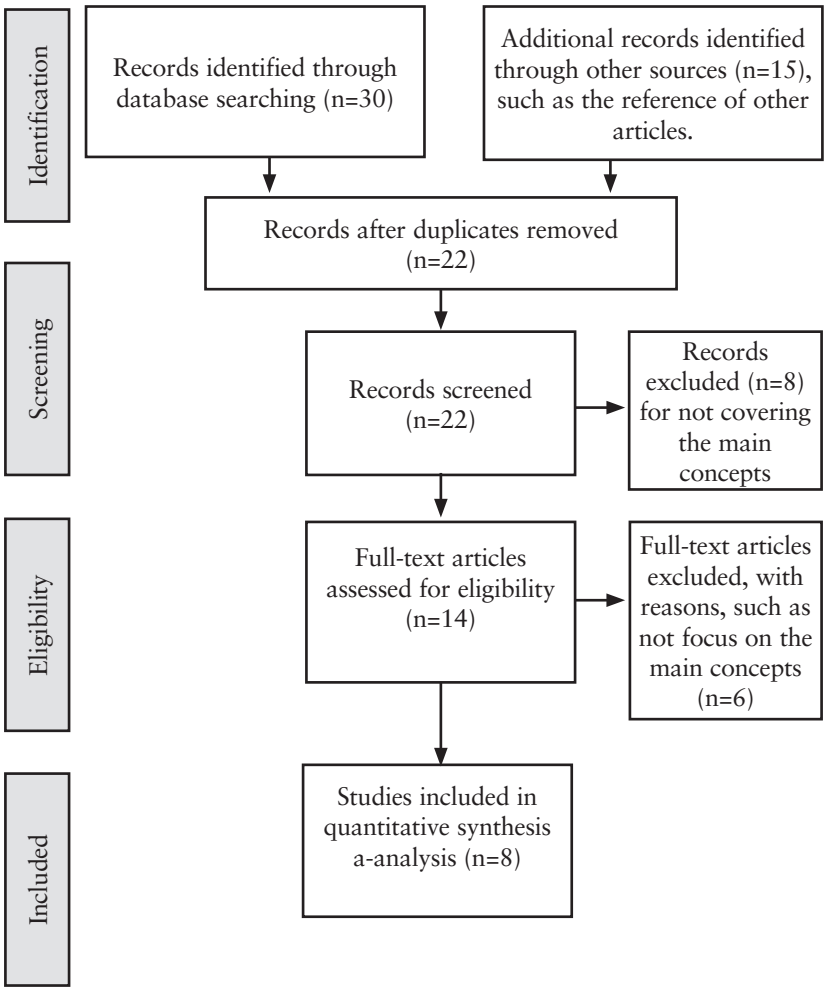
In developed countries most women do not continue breastfeeding for six months postpartum (Abuhammad and Johnson, 2018) as recommended by WHO and UNICEF (2003). In the US, the Centers for Disease Control and Prevention (2010) breastfeeding report indicated a gap between the targets of national programmes like Healthy People 2010 and the percentages of breastfeeding recorded: only 35% of infants are exclusively breastfed up to three months with only 44% of them having any breastmilk at six months.

Jordan is not an exception: here, the rates of breastfeeding have decreased during the last few years, as demonstrated by the results of the last two Jordanian population and family health surveys. The percentage of exclusively breastfeeding mothers of infants aged six months decreased from 40% in 2007 to 20% in 2016 (Jordanian Department of Statistics, 2017). This decrease indicates an increased risk to the health of mothers and infants as babies may be more vulnerable to gastritis, otitis media or respiratory problems (Abuhammad and Johnson, 2018; Kavanagh et al, 2012), while mothers may be at an increased risk of breast cancer, hemorrhage and obesity (Hamadneh et al, 2018). This will significantly increase the costs on the healthcare system. Since Jordan is one of the limited-resources countries this overload on the healthcare system will negatively affect the economy.

To address this situation, social information, social influence and behavioral beliefs about breastfeeding have been studied. The main reasons reported for not initiating breastfeeding or for giving up breastfeeding are negative attitudes among women, their partners, family members and healthcare professionals, lack of knowledge, low social support, employment, breastmilk insufficiency, and infant and maternal illness (Hamadneh et al, 2018; Vijayalakshm, et al, 2015). The message about the infant feeding method is communicated to men and women through the mass media, popular culture, social networks and other channels. These sources of knowledge help shape attitudes towards the preferred infant-feeding method (Abuhammad, 2016; Saied et al, 2013).

College students have been considered an appropriate population in several research studies in Hong Kong (Tarrant and Dodgson, 2007), the US (Chang et al, 2012; Marrone et al, 2008), Jordan (AL-Ali et al, 2013) and Egypt (Ahmed and El Guindy, 2011). Previous studies indicated that attitudes towards breastfeeding start to form before pregnancy (Abuhammad and Johnson, 2018; Vijayalakshmi et al, 2015). Knowledge and previous exposure to breastfeeding are important factors in determining their intention towards breastfeeding (Abuhammad, 2016; Tarrant and Dodgson,

Figure 1. PRISMA for breastfeeding knowledge and attitude



2007). Promoting breastfeeding as the normal way of infant feeding among young people may be the first step in raising the rates in the near future (Kavanagh et al, 2012).

Assessing young people's knowledge, attitude and previous exposure to breastfeeding may help to determine factors that affect the intention to breastfeed.

Literature review

A systematic and comprehensive literature review was undertaken to address the question: 'What are an undergraduate student's knowledge, feeling, and intention toward breastfeeding?' CINAHL, MEDLINE, PubMed, and the web was searched using the key words 'breastfeeding, attitude, feeling, intention and undergraduate students'. The inclusion criteria were studies published in English between 2007 and 2018. Papers were excluded if they were not focused on the main concepts and population of this study.

A decision about the choice of infant-feeding method is multifactorial as social, psychological, emotional and environmental factors have been found to be associated with future parental decisions. Psychosocial factors like the the body image of the mother pre-pregnancy have correlated with her confidence to initiate breastfeeding. Little attention is given in the media to breastfeeding as the normal method of feeding a baby (Stuebe and Bonuck, 2011). Since the 1970s, especially in developing countries, formula-feeding companies have aggressively marketed their products as the normal and practical choice for families (Abuhammad and Johnson, 2018).

Few studies have examined infant-feeding knowledge among university students. In Jordan, no previous research examined the degree of infant-feeding knowledge, attitude, feelings and future intention among female and male university students. Two studies looked at the knowledge and attitude of female undergraduate students. However, in Kuwait, Ebrahim et al (2011) conducted a cross-sectional study examining the knowledge, misconception and future intention among female university students and found that participants' level of knowledge was good, especially relating to the benefits of breastfeeding.

The majority of participants were aware that breastfed infants are less susceptible to diarrhoea, vomiting, common colds, constipation and allergies when compared to formula-fed infants. They also reported that the breastfed infant had a calmer mood and more intelligence. The evidence concerning intelligence is debatable. In contrast low knowledge scores were reported in the area of benefits/recommendations for exclusive breastfeeding. Seventy-four per cent of students thought that optimal exclusive breastfeeding was for more than six months, 12.9% and 13.2% thought that it should be for four to six months and the remainder thought breastfeeding should be for less than four months. Low knowledge scores were reported when answering questions about the time to start breastfeeding, when to stop and what to do if they had a skin rash, fever or sore throat or mild medical condition (Ebrahim et al, 2011).

In Egypt, an exploratory descriptive study by Ahmed and El Guindy (2011) assessed the knowledge, attitude and perceived adequacy of breastfeeding education among female baccalaureate nursing students. Only 52% of participants demonstrated a moderate knowledge level. Half of the participants did not know what exclusive breastfeeding meant and about 85% did not know that breastfeeding is recommended for the first six months of life WHO and UNICEF (2003). However, most of the students agreed that breast milk alone provides enough nutrition for young infants and is the best feeding choice as it reduces gastroenteritis among newborns.

Tarrant and Dodgson (2007) conducted a cross-sectional study among undergraduate Hong Kong female and male university students, and found their overall knowledge about infant feeding was good though some believed that breastfeeding was painful and only half knew that bottle-fed

babies were more susceptible to illnesses than breastfed babies. They also found that students who intended to breastfeed had significantly higher knowledge levels than those who did not.

Tarrant and Dodgson (2007) indicated that knowledge level correlated to the level of education and was associated with an educational background. Accumulative evidence found a strong correlation between young people's attitude toward infant feeding methods and their future intention (Khoury et al, 2016; Kavanagh et al, 2012). The practice of breastfeeding has a religious basis in Arabic Islamic cultures. The Qur'an, specifically promotes breastfeeding and defines the suckling, weaning and rearing of infants (Qur'an, 2:233).

In a Kuwaiti study, the majority of female university students reported that breastfeeding was a religious duty. Those who said this also showed a higher intention to breastfeed (Ebrahim et al, 2011).

Kavanagh et al (2012) used a cross-sectional design in a convenience sample of 248 undergraduates attending two sections of an introductory nutrition class at a large research university. They found 16% (n=40) of participants did not know how they were fed as babies and 23% had not been breastfed at all. Most reported having witnessed breastfeeding before and or knowing someone who had breastfed (n=200, 76%). Students who were breastfed achieved significantly higher knowledge and attitude scores compared to those who were not breastfed. Most of the studies found a significant correlation between knowledge level and intention to breastfeed, with lower levels of knowledge about breastfeeding having a negative influence on breastfeeding intention. However, the attitude of young people can play a key in the future intention toward breastfeeding. Misconceptions, such as beliefs that 'breastfeeding is painful, disgusting and awful', can form negative attitudes that may influence the decision to breastfeed, leading to increased rates of formula feeding. The experiences of seeing someone breastfeeding and being breastfed as a baby were significantly associated with the level of knowledge and attitude.

Objectives

To assess knowledge and attitudes towards infant-feeding methods among students in the public university in Irbid to assess their intentions towards choice of infant-feeding method, and to explore the relationship between students' age, gender, knowledge, attitudes, feelings and intentions towards infant-feeding methods.

Design

The study was exploratory and descriptive using a cross-sectional design.

Settings

Data collection took place in the Jordan University of Science and Technology (JUST) in northern Jordan. The university comprises 12 facilities (medicine, nursing, applied sciences, agriculture, architecture and design, veterinary, computer and information technology, pharmacy, dentistry, engineering, science and arts, and graduate studies) and enrols some 20,000 undergraduate students.

Table 1. Student distribution in each faculty

Current employment	Number of students in college	Frequency in sample	Per cent from sample size
Architecture	843	14	3.3
Engineering	5,508	91	21.8
IT	2,445	42	1.0
Medicine	3,478	59	14.1
Dentistry	1,880	32	7.7
Agriculture	930	15	3.6
Pharmacy	3,828	64	15.3
Nursing	983	17	4.1
Veterinary	387	7	1.7
Science and art	2,105	36	8.6
Applied science	2,452	41	9.8
Total	24,839	418	10.0

Sample

The population of the study was all Jordanian university students attending JUST. The sample size was estimated based on the total number of undergraduate students in the University (n=20,000). A sample of 385 would be sufficient for statistical confidence. By adding 10% to accommodate drop out, the desired sample size became 424 students. To ensure the best representation of faculties, proportionate stratified sampling was used: the number of students in each faculty was converted to a percentage then each faculty was represented in the sample based on its number of students related to the total students in university. The number of surveys distributed to all the major faculties in JUST based on this proportionate stratified sampling technique is shown in Table 1.

Instrument

Demographic characteristics and experience

The demographic section comprised of two parts. The first part asked four questions about gender, year of birth, faculty and the year of study at the university; the second part asked about previous exposure to breastfeeding through three (yes/no) questions: whether the participant had been breastfeed when he/she was an infant; if he/she knew anyone who had been breastfed; whether he/she had witnessed breastfeeding before.

Breastfeeding knowledge and attitude scale

The breastfeeding knowledge and attitude scale is a structured self-administrated questionnaire developed by Pollock et al (2002) then modified by Tarrant and Dodgson (2007). The questionnaire subscales are focused on knowledge, attitude and intent. The subscales addressing knowledge and attitude of participants on breastfeeding involved 31 questions: 14 about knowledge and 17 about attitudes towards breastfeeding. Correct answers were scored 1 and incorrect scored 0, with a total score for the scale of 14.

Attitude toward breastfeeding was assessed by 17 questions that used a four-point Likert scale (strongly agree, somewhat agree, somewhat disagree, strongly disagree), with a total score for the scale of 56. The last section comprised two questions asking about the future infant-feeding intention of the individual, how they would feed their baby or support their partner in feeding. The questions were: do you intend to breastfeed your baby in the future/or to support your wife to breastfeed?; do you intend to feed your baby artificially in the future or to support your wife in formula feeding? The reliability of the whole instrument was Cronbach alpha=0.86. The internal consistency/reliability of knowledge subscale was .87, the attitude subscale was adapted from Tarrant and Dodgson (Cronbach alpha= .72), and the Cronbach alpha for intention scale was .67 (Hatamleh et al, 2018).

Ethical considerations

Institutional Review Board approval for the study was obtained from JUST. Participants' rights were ensured by: attaching each questionnaire with a sheet providing all the information about the research purpose and goals; voluntary participation, assurance of confidentiality and anonymity.

Data collection procedure

Data collection took place across the university buildings and colleges. To ensure a comprehensive distribution of questionnaires, data collection was carried out at different times of the day.

Results

Socio-demographic characteristics

The number of questionnaires returned to the researchers was (n=418) from (n=424). The majority of participants were female, 65.1% (n=272), 34.9% were male (n=146). Students were from nursing, medicine, veterinary, pharmacy, applied science and art, medical sciences, agriculture, engineering, architecture and IT.

For more information regarding demographic characteristics see Table 2.

Previous exposure to breastfeeding

Most students reported being breastfed when they were infants (n=373, 89.2%) and (95% CI 87.3, 91.1). The majority of students (n=401, 95.5%) and (95% CI 87.3, 91.1) knew someone who had breastfed and the majority (n=361, 86.4%) and (95% CI 83.2, 89.6) had witnessed breastfeeding.

The results are represented in Table 3.

Assessing knowledge about breastfeeding

Knowledge scores ranged from 62.6% to 94%, with a mean score of 9.3 (SD=13.3), indicating overall good knowledge levels in issues regarding breastfeeding.

Table 4 shows each question and the answers.

An independent sample T-test was conducted to compare male and female student's knowledge levels to detect any significant differences between genders. Men demonstrated a slightly higher knowledge about breastfeeding but there was no significant difference between genders (t=1.467, P< .143).

Assessing attitude about breastfeeding

Mean attitude scores were 2.62 (SD= .25), with a range from 1.76 to 3.60, indicating overall positive attitudes toward breastfeeding. These attitudes include: 1. Formula-feeding gives more freedom to the mother; 2. Breastfeeding makes breasts less attractive; 3. Breastfeeding would make my partner or me more attractive; 4. Babies enjoy breastfeeding more than formula-feeding; 5. Breastfeeding will help a mother feel closer to her baby; 6. Formula-feeding is more sanitary than breastfeeding; 7. Breastfeeding in public places is embarrassing.

Independent T-test results showed that there were significant differences in attitude between the two genders (t=4.32, p <.00), with males tending to have a higher positive attitude toward breastfeeding. See Table 5 for the frequency and percentage for each attitude question.

Intention toward infant feeding methods:

A higher proportion of students (80.6%) (95% CI: 76.4, 84.8) said that in the future they intend to breastfeed or support breastfeeding, compared to the students (15.1%) (95% CI: 12.0, 18.2) who said that in future they intend to bottle feed. This result may be explained by the theory of planned behavior, which proposes that one of the factors that impact on behavior is the emotions one holds toward that

Table 2. Demographic characteristics for the participants

Characteristics	n=418 (%)
Sex:	
Male	146 (34.9%)
Female	272 (65.1%)
Age (yrs):	
Less than or equal 22years	341 (81.6%)
More than 22 years	77 (18.4%)
Faculty:	
Health faculties	271 (64.8 %)
Non-health faculties	147 (35.2%)
Year of study	
Undergraduate year 1	108 (25.8%)
Undergraduate year 2	123 (29.4%)
Undergraduate year 3	47 (11.2%)
Undergraduate year 4	77 (18.4%)
Undergraduate year 5	63 (15.1%)

Table 3. Exposure to breastfeeding

Characteristics	Yes	95% CI
1. Were you breastfed when you were an infant?	373 (89.2%)	(87.3, 91.1)
2. Do you know someone who has breastfed	401 (95.9%)	(93.1, 98.7)
3. Have you ever witnessed a woman breastfeeding	361 (86.4%)	(83.2, 89.6)

Table 4. Knowledge scale analysis for breastfeeding

Question	Correct answers n (%)	95% CI
1. For a baby, breastfeeding is healthier than bottle-feeding.	275 (65.8%)	(61.2, 69.3)
2. The baby sucking on the mother's breast is painful.	253 (60.5%)	(56.7, 64.3)
3. Breastfed baby are smarter than babies who are not breastfed.	342 (81.8%)	(78.4, 85.2)
4. There is no difference between breast milk, cow's milk and soymilk.	311 (74.4%)	(71.1, 77.7)
5. Breastfeeding alone provides sufficient nutrition in the first few months of life for the baby.	332 (79.4%)	(77.2, 81.6)
6. Nicotine, caffeine, alcohol and medicine are passed from the mother's body to breastmilk.	354 (84.7%)	(82.3, 87.1)
7. Most women make enough breastmilk to adequately feed the baby.	284 (68.6%)	(65.1, 72.1)
8. The breastfeeding woman should avoid eating certain foods.	360 (86.1%)	(83.2, 89.0)
9. Babies who are bottle-fed have more illnesses than babies who are breastfed.	353 (84.7%)	(81.2, 88.2)
10. Breastfeeding helps prevent infections in the baby.	376 (90.0%)	(88.1, 91.9)
11. Breastfeeding helps protect babies from having allergies.	365 (87.3%)	(84.2, 90.4)
12. A woman who has small breasts cannot breastfeed.	260 (62.2%)	(58.4, 66.0)
13. Some babies have allergies to cow's milk.	323 (77.3%)	(73.3, 81.3)
14. Breastfeeding should be started as soon as possible after the baby is born.	395 (94.7%)	(91.4, 98.0)

behavior (Abuhammad, 2016). This study indicated that the majority of students reported that breastfeeding makes a mother feel closer to her baby and they agreed that mothers of all socioeconomic levels should breastfeed their infants. See Table 6.

Discussion

Knowledge about infant feeding methods

The percentage of breastfeeding mothers has decreased in the last few years in Jordan according to the family survey (2016). This study aimed to explore some factors that affect decision making about breastfeeding among undergraduate students. Knowledge is one of the factors that previous studies have found to correlate with the intention to breastfeed (Khasawneh, 2017; Al-Ali et al, 2013).

Table 6. Intention toward breastfeeding

Future breastfeeding intention	All students n (%)	95% CI
In future do you intend to breastfeed or support breastfeeding?		
Yes	337 (80.6)	(76.4, 84.8)
No	15 (3.5)	(0.4, 6.6)
Not decided	66 (15.8)	(12.8, 18.8)
Do you have the intention to bottle-feed or support your wife to bottle-feed your infant?		
No	196 (46.9)	(44.2, 49.6)
Yes	63 (15.1)	(12.0, 18.2)
Don't know	158 (6.2)	(3.5, 8.9)

The results of this study showed that the level of knowledge about breastfeeding among undergraduate students was adequate and that there was no significant difference between knowledge and gender. Students knew that breast milk, cows' milk and soy milk are not the same and that breast milk alone can provide sufficient nutrition for the infant in the first months of life. Our findings are congruent with findings reported by Tarrant and Dodgson (2007), but lower than results reported in another international study (Ahmed and El Guindy, 2011).

Attitude toward breastfeeding

Students reported a positive attitude toward breastfeeding, with male students having a significant higher positive than female student. This is similar to that reported in previous study (Tarrant and Dodgson, 2007). Religion may be one of the factors that affects attitude toward breastfeeding. Jordan and most of the Middle East are Islamic countries, they follow instructions from the Qur'an and Sunnah. The Qur'an encourages breastfeeding and gives muslims specific instructions regarding the suckling, weaning and rearing of infants: 'Mothers shall give suck to their children for two full years for those who desire to complete the term,' (Qur'an, 2:233), clearly encouraging mothers to breastfed their infant for two years. In a Kuwaiti study, students reported breastfeeding as a religious duty (Ebrahim et al, 2011). This recommendation can form a positive attitude and encourage

Table 5. Attitude scale analysis

Question	Frequency and percentage			
	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
1. Formula-feeding gives more freedom to the mother.	108 (25.8%)	186 (44.5%)	90 (21.5%)	32 (7.4%)
2. Breastfeeding makes breasts less attractive.	74 (17.7%)	130 (31.1%)	137 (32.8%)	77 (16%)
3. Breastfeeding would make my partner or me more attractive.	38 (9.1%)	144 (34.4%)	145 (34.7%)	85 (2.3%)
4. Babies enjoy breastfeeding more than formula-feeding.	13 (3.1%)	43 (1.3%)	127 (3.4%)	234 (56%)
5. Breastfeeding will help a mother feel closer to her baby.	7 (1.7%)	5 (1.2%)	35 (8.4%)	370 (88.5%)
6. Formula-feeding is more sanitary than breastfeeding.	37 (8.9%)	29 (6.9%)	116 (27.8%)	236 (56.5%)
7. Breastfeeding in public places is embarrassing.	138 (33%)	153 (36.6%)	62 (14.8%)	62 (14.8%)
8. Formula-feeding and breastfeeding benefit the child equally.	15 (3.6%)	52 (12.4%)	210 (5.2%)	140 (33.5%)
9. The decision of breastfeeding should be made by both parents and not just by the mother of the baby.	71 (17%)	71 (17%)	144 (34.4%)	126 (3.1%)
10. Breastfeeding is acceptable in public places.	208 (49.8%)	129 (3.9%)	51 (12.2%)	29 (6.9%)
11. I want my partner or myself to breastfeed my baby.	44 (1.5%)	88 (21.1%)	142 (34%)	130 (31.1%)
12. Only girl babies should be breastfed.	20 (3.6%)	31 (7.4%)	129 (3.9%)	240 (57.4%)
13. Babies who are breastfed get a better start in life.	15 (3.6%)	31 (7.4%)	129 (3.9%)	240 (57.4%)
14. Women of all educational levels should breastfeed their children.	10 (2.4%)	16 (3.8%)	100 (23.9%)	288 (68.9%)
15. Women of all socioeconomic class should breastfeed their children.	14 (3.3%)	19 (4.5%)	92 (22%)	292 (69.9%)
16. Breastfeeding is more convenient than formula-feeding.	28 (6.7%)	119 (28.5%)	143 (34.2%)	127 (30.4%)
17. I respect women who breastfeed.	10 (2.4%)	14 (3.3%)	72 (17.2%)	322 (77.0%)

breastfeeding. However, students have the same barriers toward breastfeeding that were reported in previous studies (Abuhammad, 2016; Tarrant and Dodgson, 2007), where embarrassment with breastfeeding in public was documented as the main reason for not initiating and sustaining breastfeeding. Moreover, previous exposure to breastfeeding was assessed through three questions: breastfed as an infant, knowing someone who breastfed, and witnessing breastfeeding. Most of the students had been breastfed when they were infants, and most of them knew someone who had breastfed, or had witnessed breastfeeding. This result is higher than reported by Tarrant and Dodgson (2007) where only third of participants reported having been breastfed as an infant, more than half knew someone who was breastfed and less than half had witnessed breastfeeding. Females had significantly higher exposure to breastfeeding than males in knowing someone who had breastfed or having witnessed breastfeeding mothers before, whereas no significant differences were found with their answers about being breastfed as infants.

Assessing intention toward infant feeding methods

Respondents show a high commitment to breastfeeding. The majority of males intended to support their wives breastfeeding their infants and only a few students reported that they will support a decision to bottle feed. Most of the female students intended to try breastfeeding their future infants with only a small number supporting the choice of bottle feeding.

The findings of this study revealed that there were significant differences between genders and future intention, with females showing a higher intention to breastfeed than males. This contrasts with Tarrant and Dodgson (2007), where only 66% males and 59.8% of females intended to breastfeeding.

Studies made in Middle Eastern countries such as Jordan (AL-Ali et al, 2013) and Kuwait (Ebrahim et al, 2011) reported contradictory results to Tarrant and Dodgson (2007). They found no significant differences between genders. This may relate to the high percentages of breastfeeding still found in these developing countries compared to that found in other places of the world, and the high employment rates of women in countries like the US, China and Korea, which may inversely impact on rates of breastfeeding in these countries.

Conclusion

The overall knowledge, attitude, previous exposure, feelings and future intention among university students were adequate, with health major students reporting higher scores than non-health major students in terms of the main study variables. Male students had greater knowledge and more positive attitudes than females, while female students had higher positive feelings and a higher future intention about breastfeeding. Despite the high percentages of intentions to breastfeed, feeling that breastfeeding is embarrassing in public is still considered the main concern for not initiating breastfeeding and choosing bottle feeding. The idea that breastfeeding restricts the mother's freedom has also been found to be associated with choosing bottle feeding. This research has been limited due to the lack of randomisation and geographical clustering. The sample was limited to students at university level who are well educated and from higher socioeconomic settings. Further research is needed to explore the influence of midwives and nurses, and the barriers they may pose when implementing a breastfeeding programme.

However, the study does provide new information that can be used to support a recommendation for the development of a national policy for the promotion of breastfeeding as the best way for infant feeding.

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