

Knowledge of Female Medical Students about Breastfeeding

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Abstract Objective: to highlight the knowledge of female medical students about breastfeeding in general and in special situations. Subjects and methods: A descriptive cross-sectional study on female medical students enrolled in the academic year 2011/2012 in Mansoura Faculty of Medicine from first to final years using self-administered questionnaire. Results: A total of 631 students participated with 258 in the preclinical and 373 in the clinical grades. Generally, the majority of students were more aware about initiation, duration and advantages of breastfeeding than correct breastfeeding practice in some special situations. Conclusion: Educational stage is a significant variable in the level of knowledge and medical students and the joiner year's curricula must include more knowledge about breastfeeding.

Keywords Breastfeeding, Medical Students, Special Situation, Exclusive Breastfeeding

1. Introduction

There is a universal consensus about the fundamental importance of breastfeeding for children's adequate growth and development and their physical and mental health [1]. It confers significant health, nutritional, immunologic, developmental, psychological, social, economic, and environmental benefits to infants, mothers, families, and society [2].

No artificial feeding formula is capable of qualitatively replacing breast milk, and its specific nutrients and protection against diseases [1].

Breastfeeding is recommended by the World Health Organization (WHO) as a key measure to ensure the health of mothers and children. In 2002, WHO recommended "all infants should be exclusively breastfed for the first six months of life, and receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond" [3].

However, there has been a general decline in the practice of breast feeding both in terms of prevalence and duration in

the past few decades [4]. Despite the demonstrated benefits of breast milk, the prevalence of breastfeeding, in particular exclusive breastfeeding, in many developing countries, is lower than the international recommendation of exclusive breastfeeding [5].

Health care professionals can play a vital role in promoting breastfeeding. Studies from some Muslim countries have shown that although health professionals had a positive attitude towards breastfeeding, their knowledge was inadequate [6].

It is proved that training of health workers in breastfeeding and lactation management enhances professional recommendations on breastfeeding [7]. However, the training of health workers can play an important role in the promotion, protection and support feeding specially on timely initiation of breast feeding [8]. Schools of medicine, nutrition, nursing and public health failed to include breastfeeding in their curricula in the past and even students were taught on the preparation and handling of breast milk substitutes [9]. Although many studies identified the knowledge about breastfeeding among mothers, no studies was found in the literature discussing the knowledge of medical students regarding breastfeeding in Egypt.

2. Aim of the Study

This study was conducted to highlight the knowledge of female medical students about breastfeeding in general and in special situations, as well as the variation of knowledge according to residence, marital status and educational stage of students.

3. Subjects and Methods

Study Locality and Duration

This study was carried out among female students in Mansoura Faculty of Medicine who were enrolled in the academic year 2011/2012; traditional teaching program. Mansoura University is located in north east of Nile Delta,

Egypt.

Traditional program is a free, teacher-centered and fragmented in education, thus information about physiology of breastfeeding is taught in the 2nd year, and advanced information is given during the 4th year in the curriculum of Public Health and Community Medicine and during 5th year in the Pediatrics. A recently introduced teaching program is the Mansoura Manchester Program is a problem-based and student-based teaching with integration between different disciplines. It is a paid program with little number of students and most of them are expatriates.

Study Type

This is a descriptive cross-sectional study.

Sample size and technique

Sample size: sample size was calculated online (<http://www.dssresearch.com/KnowledgeCenter/toolkitcalculators/samplecalculator.aspx>). As the percent of female students with correct knowledge of the duration of exclusive breastfeeding is definitely unknown, we assumed that at 50% of them know that exclusive breastfeeding should be continued for 6 months and the worst acceptable level is 45%. The required sample size is about 616 at 95% confidence level and 80% study power. We added 20% to compensate for non-response rate. Thus the final sample size is about 740 female students from different academic years.

Sampling technique: The total number of registered Egyptian female students during the study time was about 3000. We aimed to contact a quarter (750) of these students. A master list was prepared for females in each academic year. From this list we selected a systematic random sample of students (every 4th student). The starting number was selected randomly from the list. Absent student were replaced by the next one in the list. The questionnaire was distributed to students during the class time (practical section for the preclinical years and clinical rounds for the clinical years). A total of 631 completed questionnaires were collected (response rate = 84.1%).

Study Tool

Self-administered questionnaire was pretested in pilot study (not included in full-scale study) on 60 female students to test comprehension of the questionnaire and time needed for its completion. Wording modifications based on comments and remarks of students were considered which yield cultured based and simple comprehensive questionnaire.

The questionnaire included personal data, (age, residence, grade and marital status) and knowledge about the correct breastfeeding practices and breastfeeding in special situations e.g. twin, infectious disease of mother, .etc.

Ethical Consideration

Oral informed consents were obtained from the

participants after explanation of study objectives with strict confidentiality and the name and identity was optional. The study protocol was approved by Research Ethics Committee.

Statistical Analysis

The returned questionnaires were revised for completeness and the collected data were coded, processed and analyzed through SPSS (Statistical Package for Social Sciences version 16). Variables were presented as numbers and percent. Chi square test of significance was used for group comparison. $P \leq 0.05$ was considered statistically significant.

4. Results

Table 1 shows that overall 77% students knew that breastfeeding should be initiated immediately after birth, 63.2% said that breastfeeding should continue for 2 years and 45.2% knew the correct definition of exclusive breast feeding and about half of them knew that exclusive breastfeeding should be continued for 4-6 months and only 7.6% said that weaning should be started between 6-12 months. Less than three-quarters (74%) of students felt that colostrum should not be discarded and 88.4% thought that it is beneficial.

Knowledge about breast feeding initiation, duration and supplementation was more likely to be affected by education stage and residence.

Table 2 reveals that 47.9% of students said that breastfeeding reduces chances of subsequent pregnancy, almost all students knew that breastfeeding is cheap and available, easier to digest and always sterile. More than three quarters of students said that breastfeeding prevents diarrhea and that bottle feeding has adverse effects. Clinical students had better knowledge in all questions about advantages of breastfeeding.

In table 3, 8.9% and 22.3% from preclinical and clinical students; respectively ($p \leq 0.001$) said that initiation of breastfeeding should start immediately after caesarian section. Regarding continuation of breastfeeding in maternal infectious diseases, 23.3% of students said that breastfeeding should continue with maternal tuberculosis (preclinical 7.8% vs. clinical 34%; $p < 0.001$) and 18.1% with maternal AIDs. About 25% and 31.5% of total students knew that breastfeeding should continue with hepatitis B and C; respectively and a significant difference was detected related to marital status and educational stage in these two situations. Only 1.6% of students said that breastfeeding should continue with sore nipple, with significant difference ($p < 0.001$) related to education stage.

More than 12% of students knew that pregnant mother should continue breastfeeding for months with significant difference related to residence.

About half of the students said that twins should be exclusively breastfeed with significant difference between

urban and rural residents and preclinical and clinical stage.

About half students were aware that breastfeeding should be continued in a baby even if he/she develops diarrhea and significant differences were detected among all independent variables for the favor of urban over rural, married over single and clinical over preclinical stages. But only 36.5% of students said that breastfeeding should continue with baby respiratory infection and the correct answer were mostly for

married and clinical stage students.

Educational curriculum was the main source of knowledge reported by all students. It was selected by 100% of clinical stage students compared to 62% of preclinical stage students ($p \leq 0.001$). The need for more information was reported by 51.3% of all students with statistical difference ($p \leq 0.001$) with the three predictors studied (table 4).

Table 1. Student's knowledge about initiation, duration and supplementation of breastfeeding

	Total (631)	Residence		Marital status		Education stage	
		Rural (230)	Urban (401)	Single (608)	Married (23)	Preclinical (258)	Clinical (373)
BF should be start Immediately after birth	486(77.0)	168(73.0)	318(79.3)	466(76.6)	20(87.0)	167(64.7)	319(85.5)
Significance		$\chi^2=3.2, p=0.07$		$\chi^2=1.3, p=0.2$		$\chi^2=37.2, p \leq 0.001$	
BF should be continued for 2 years	399(63.2)	160(69.6)	239(59.6)	382(62.8)	17(73.9)	116(45.0)	283(75.9)
Significance		$\chi^2=6.2, p=0.01$		$\chi^2=1.17, p=0.27$		$\chi^2=99.9, p \leq 0.001$	
Nothing should be given to exclusively breastfed babies	285(45.2)	94(40.9)	191(47.6)	272 (44.7)	13(56.5)	78(30.2)	207(55.5)
Significance		$\chi^2=2.7, p=0.1$		$\chi^2=1.3, p=0.2$		$\chi^2=39.9, p \leq 0.001$	
Exclusive BF should be continued for 4-6 months	325(51.5)	124(53.9)	201(50.1)	312(51.3)	13(56.5)	93(36.0)	232(62.2)
Significance		$\chi^2=0.8, p=0.3$		$\chi^2=0.2, p=0.6$		$\chi^2=41.7, p \leq 0.001$	
Weaning should be started at 6-12 months	48(7.6)	13(5.7)	35(8.7)	48(7.9)	0	27(10.5)	21(5.6)
Significance		$\chi^2=1.9, p=0.1$		$\chi^2=1.6, p=0.1$		$\chi^2=5.1, p=0.02$	
Colostrum shouldn't be discarded	467(74.0)	158(68.7)	309(77.1)	447(73.5)	20(87)	172(66.7)	295(79.1)
Significance		$\chi^2=5.3, p=0.02$		$\chi^2=2, p=0.14$		$\chi^2=12.2, p \leq 0.001$	
Colostrum is beneficial	558(88.4)	199(86.5)	359(89.5)	536(88.2)	22(95.7)	211(81.8)	347(93)
Significance		$\chi^2=1.3, p=0.2$		$\chi^2=1.2, p=0.2$		$\chi^2=18.8, p \leq 0.001$	

BF: breastfeeding

Table 2. Student's knowledge about advantages of breastfeeding

Advantages of BF*	Total (631)	Residence		Marital status		Education stage	
		Rural (230)	Urban (401)	Single (608)	Married (23)	Preclinical (258)	Clinical (373)
BF reduces chances of subsequent pregnancy	302(47.9)	104(45.2)	198(49.4)	209(47.7)	12(52.2)	87(33.7)	215(57.6)
Significance		$\chi^2=1, p=0.3$		$\chi^2=0.1, p=0.6$		$\chi^2=34.9, p \leq 0.001$	
Cheap and available	593(94.0)	212(92.2)	381(95)	570(93.8)	23(100.0)	226(87.6)	367(98.4)
Significance		$\chi^2=2, p=0.1$		$\chi^2=1.5, p=0.2$		$\chi^2=31.4, p \leq 0.001$	
Easier to digest	618(98.1)	390(97.5)	228(99.1)	595(98.0)	23(100.0)	246(95.7)	372(99.7)
Significance		$\chi^2=2.1, p=0.1$		$\chi^2=0.4, p=0.4$		$\chi^2=13.1, p \leq 0.001$	
Always sterile	568(90.0)	204(88.7)	364(90.8)	546(89.8)	22(95.7)	216(83.7)	352(94.4)
Significance		$\chi^2=0.7, p=0.4$		$\chi^2=0.8, p=0.3$		$\chi^2=19.2, p \leq 0.001$	
Prevents diarrhea	523(82.8)	182(79.1)	341(85.1)	501(82.4)	22(95.7)	212(82.2)	311(83.4)
Significance		$\chi^2=3.5, p=0.06$		$\chi^2=2.7, p=0.09$		$\chi^2=0.15, p=0.7$	
Bottle feeding has adverse effect	475(75.3)	176(76.5)	299(74.6)	454(74.7)	21(91.3)	142(55)	333(89.3)
Significance		$\chi^2=0.3, p=0.5$		$\chi^2=3.2, p=0.07$		$\chi^2=96, p \leq 0.001$	

*Categories are not mutually exclusive

BF: breast feeding

Table 3. Student's knowledge about breastfeeding in special situations

	Total (631)	Residence		Marital status		Education stage	
		Rural (230)	Urban (401)	Single (608)	Married (23)	Preclinical (258)	Clinical (373)
BF should start immediately after Caesarian section	106(16.8)	32(13.9)	74(18.5)	99(16.3)	7(30.4)	23(8.9)	83(22.3)
Significance		$\chi^2=5.2, p=0.15$		$\chi^2=6.5, p=0.08$		$\chi^2=20.9, p\leq 0.001$	
Working mother should be breast feed her baby	558(88.4)	194(84.3)	364(90.8)	536(88.2)	22(95.7)	209(81.0)	349(93.6)
Significance		$\chi^2=5.9, p=0.02$		$\chi^2=1.2, p=0.2$		$\chi^2=23.5, p\leq 0.001$	
BF should be continued with maternal tuberculosis	147(23.3)	54(23.5)	93(23.2)	138(22.7)	9(39.1)	20(7.8)	127(34.0)
Significance		$\chi^2=0.3, p=0.8$		$\chi^2=5.1, p=0.07$		$\chi^2=73.4, p\leq 0.001$	
BF should be continued with maternal AIDS	144(18.1)	44(19.1)	70(17.5)	108(17.8)	6(26.1)	2(0.8)	112(30.0)
Significance		$\chi^2=0.27, p=0.8$		$\chi^2=1.9, p=0.3$		$\chi^2=92.1, p=0.3$	
BF should be continued with maternal Hepatitis B infection	155(24.6)	60(26.1)	95(23.7)	138(22.7)	17(73.9)	35(13.6)	120(32.2)
Significance		$\chi^2=0.9, p=0.6$		$\chi^2=31.5, p\leq 0.001$		$\chi^2=37.9, p\leq 0.001$	
BF should be continued with maternal Hepatitis C infection	199(31.5)	78(33.9)	121(30.2)	182(29.9)	17(73.9)	35(13.6)	164(44.0)
Significance		$\chi^2=2.2, p=0.3$		$\chi^2=20.3, p\leq 0.001$		$\chi^2=65.5, p\leq 0.001$	
BF should be continued with maternal anemia	330(52.3)	125(54.3)	205(41.1)	309(50.8)	21(91.2)	83(32.2)	247(66.2)
Significance		$\chi^2=0.6, p=0.7$		$\chi^2=14.5, p\leq 0.001$		$\chi^2=70.9, p\leq 0.001$	
Mothers with sore nipple should use antiseptic lotions and antibiotics	26(4.1)	10(4.3)	16(4)	26(4.3)	0	8(3.1)	18(4.8)
Significance		$\chi^2=3.3, p=0.5$		$\chi^2=2.8, p=0.5$		$\chi^2=68.3, p\leq 0.001$	
Pregnant mother should continue BF for months	79(12.5)	40(17.4)	39(9.7)	74(12.2)	5(21.7)	31(12)	48(12.9)
Significance		$\chi^2=12.7, p=0.01$		$\chi^2=3.6, p=0.4$		$\chi^2=6.4, p=0.16$	
Mother should exclusively breastfed her twin babies	334(52.9)	107(46.5)	227(56.6)	323(53.1)	11(47.8)	154(59.7)	180(48.3)
Significance		$\chi^2=5.9, p=0.01$		$\chi^2=0.2, p=0.6$		$\chi^2=8, p=0.005$	
Twin babies should be breastfed either both together or one by one	484(76.7)	179(77.8)	305(76.1)	466(76.6)	18(78.2)	183(70.9)	301(80.7)
Significance		$\chi^2=0.2, p=0.8$		$\chi^2=1.5, p=0.4$		$\chi^2=0.3, p=0.01$	
BF should be continued if baby develops diarrhea	325(51.5)	92(40.0)	233(58.1)	305(50.2)	20(87.0)	79(30.6)	246(66.0)
Significance		$\chi^2=19.2, p\leq 0.001$		$\chi^2=12.2, p=0.002$		$\chi^2=78.8, p\leq 0.001$	
BF should be continued if baby develops respiratory infection	230(36.5)	94(40.9)	136(33.9)	218(35.9)	12(52.2)	53(20.5)	117(47.5)
Significance		$\chi^2=5.6, p=0.06$		$\chi^2=6.3, p=0.04$		$\chi^2=47.7, p\leq 0.001$	

BF: breast feeding

Table 4. Source of student's knowledge about breastfeeding

Source of knowledge*	Total (631)	Residence		Marital status		Education stage	
		Rural (230)	Urban (401)	Single (608)	Married (23)	Preclinical (258)	Clinical (373)
Educational curriculum	533(84.5)	193(83.9)	340(84.7)	514(84.5)	19(82.6)	160(62.0)	373(100.0)
Significance		$\chi^2=0.09, p=0.7$		$\chi^2=0.06, p=0.8$		$\chi^2=167, p\leq 0.001$	
Health care provider	57(9)	24(10.4)	33(8.2)	54 (8.9)	3 (13.0)	24(9.3)	33(8.8)
Significance		$\chi^2=0.8, p=0.3$		$\chi^2=0.45, p=0.49$		$\chi^2=0.04, p=0.8$	
Mass media	231(36.6)	91 (39.5)	140(34.9)	223(36.6)	8(34.7)	87(33.7)	144(38.6)
Significance		$\chi^2=1.4, p=0.2$		$\chi^2=0.03, p=0.8$		$\chi^2=1.6, p=0.2$	
Family members	289(45.8)	111(48.2)	178(44.3)	275(45.2)	14(60.8)	130(50.3)	159(42.6)
Significance		$\chi^2=0.8, p=0.3$		$\chi^2=2.2, p=0.1$		$\chi^2=3.7, p=0.06$	
Need for more knowledge about BF	324(51.3)	187(81.3)	137(34.2)	301(49.5)	23(100.0)	196(75.9)	128(34.3)
Significance		$\chi^2=130, p\leq 0.001$		$\chi^2=22.6, p\leq 0.001$		$\chi^2=105.9, p\leq 0.001$	

*Categories are not mutually exclusive

BF: breastfeeding

5. Discussion

We found that the clinical and preclinical students had difference of knowledge regarding the correct time for breastfeeding initiation and continuation, concept and duration of exclusive breastfeeding, correct age to start weaning and benefits of colostrum. This is in accordance with the knowledge expressed in a study conducted among medical students in Pakistan [10]. Another study conducted among female medical students in Pakistan, found educational level strongly related to the perception regarding initiation and duration of breastfeeding [11]. We also investigated the awareness of the future medical professionals regarding the advantages of breastfeeding; about half of students knew that breastfeeding reduces the rate of subsequent pregnancy and this was in agreement with studies conducted in Pakistan [10, 12].

Knowledge of students about advantages of breastfeeding was very good where most students knew that breastfeeding is cheap and available, easy to digest, always sterile, prevents diarrhea and that bottle feeding has adverse effects. Also, majority of the medical students in Ziauddin University, Karachi [10] were aware of the advantages of breastfeeding. Almost all the student's opinion was that breast milk can protect the children from common infections [11].

Healthcare workers confronted with lactation difficulties in new mothers may find it easier to recommend formula milk to prevent further problems and inconvenience [13]. Hence, the knowledge about breastfeeding practices regarding certain special situations related mothers and their babies were inquired from the students.

On asking about breastfeeding of twins, 52.9% and 76.7% of students thought that twin babies should be exclusively

breastfed and knew the correct methods for twin breast-feeding; respectively. This is in agreement with the figures reported in a previous study [10] where 54.9% and 84% had the same knowledge. Only 44% of students knew that breastfeeding should be continued in twins [11]. It is proved that Caesarean delivery has adverse effects on exclusive breastfeeding and anesthesia and pain suppress milk production and delays breastfeeding initiation and continuation [14, 15]. However, breastfeeding should start as early as possible, preferably within the first hours [16]. Only 10.8% of students reported that breastfeeding should start immediately after Caesarian section. In a previous study in Pakistan about 40% of medical students knew that breastfeeding should be initiated immediately after Caesarean section [10]. About 66% of primary healthcare physicians (PHCPs) in Iraq knew the correct answer [17].

As included in the guidelines for training community health workers in nutrition [18], it is not necessary to stop breastfeeding when a lactating mother becomes pregnant. While the quantity of milk may decrease, its quality may be still good and breastfeeding for the first few months of pregnancy will cause no harm to the child in her uterus. In our study only 12.5% of students knew that a pregnant mother could continue breastfeeding for months. In another study in Iraq, 64% of PHCPs recommended continuing breastfeeding for months when the mother becomes pregnant [17]. In a study from the United Kingdom, 23% of the health professionals agreed that breastfeeding should stop if pregnancy occurs, and a further 22% were not sure [19]. In Saudi Arabia, 32% of health workers would advise to stop breastfeeding immediately when a mother got pregnant [20]. A study done on college students in Saudi Arabia revealed that 64% of college girls believed that a mother should stop

breastfeeding immediately, if she is pregnant [21].

In this study 88.4% of students suggested that working mother should continue breastfeeding. This was similar to the answer of students in medical college in Karachi [10] and college students in Saudi Arabia [21].

Lactating mothers are more likely to develop sore nipples, especially those with engorged breasts and women with small or flat nipples. Sometime soreness might develop into a crack, which is very painful and might interfere with breastfeeding [17]. In this study, students were ignorant about how to deal with the problem of sore nipples were only 4.1% of students suggested the use of antiseptic ointment or antibiotics. The same finding was reported in a Pakistani study. Only 6.6% of students of medical college knew the correct answer [10] and 14% of PHCPs in Iraq recommended the use of antiseptic ointment or antibiotics [17]. When asking about continuation of breastfeeding during maternal infectious diseases, positive answers ranged from 18.1% and 31.5% according to infectious disease. In a combined question in a previous study [10], 38% of students were aware that infected mother should continue breastfeeding. Regarding breastfeeding in health problems related to the baby, 51.5% and 36.5% of students knew that breastfeeding should be continued if baby develops diarrhea and respiratory infection; respectively. This was similar to the results of a study conducted in Saudi Arabia [21] and a study on medical students in Pakistan where about half of them were aware that breastfeeding should be continued in a child having diarrhea [10]. Another study done on nurses in Karachi also showed that less than half of them were aware that breastfeeding should be continued in a child having diarrhea [22]. On the other hand, the majority of PHCPs in Iraqi health centers (98%) would advise a mother to continue breastfeeding if the baby develops diarrhea [17]. According to the levels of education, clinical years' students had better knowledge compared to pre-clinical year students. Compared to preclinical year's students, clinical year's students were exposed to plenty of information on breastfeeding as they went along their academic education and clinical training. This was confirmed by the reported source of information; in which educational curriculum (84.5%) was the main source of information reported in 100% of clinical students compared to pre-clinical students (62%).

6. Conclusion

Educational stage is a significant variable in the level of knowledge and medical students lack some basic knowledge about breastfeeding and some related problems.

7. Recommendations

As breastfeeding is considered a life-saving practice, especially in countries suffering from poor economic status and bad sanitary condition, improving knowledge of medical

students is a priority.

The chasm of knowledge between preclinical and clinical students should be crossed by adding even a brief on important topics like breastfeeding in the joiner year's curricula with the goal to change knowledge as well as attitude of the future physicians and empowering their vital role in protecting, promoting and supporting breastfeeding. A nation-wide study involving all youth in and outside universities is warranted.

8. Study Limitations

This is a single center study involving female students in a single medical school. The results do not necessarily apply to all medical students in Egypt. Despite these limitations this the first study to be done on medical students in Egypt. We did not find any similar research in Egypt to compare with. It could pave the way for further research, especially after graduation of these students during their actual practice. Qualitative research (e.g. Focus Group Discussion) will be useful than quantitative research to explore the deeply rooted and cultural belief and misconception about breastfeeding.

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