



RESEARCH ARTICLE

Breastfeeding attitudes and knowledge among future female physicians and teachers in Saudi Arabia.

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Abstract

Background: Researches who assess and explore the medical and education college students breast feeding (BF) attitudes and knowledge are lacking in Saudi Arabia.

Objectives: The present study aimed to explore the attitudes and knowledge about BF of the undergraduate female medical and education students at Colleges of Medicine and Education, King Faisal University, Saudi Arabia.

Method and material: This cross-sectional study targeted all female students at all years of enrolment at both colleges; systematic random sampling method was employed for selecting participants in proportion to their colleges and years of study. Data was collected through a self administered, anonymous, previously validated questionnaire form collecting data about the socio-demographics of the students, the Iowa Infant Feeding attitude scale and 14 items to assess their knowledge.

Results: A total of 521 female students were

included. Students at both colleges showed positive attitudes towards BF, predominantly among medical, higher grades, at their clinical stage of medical education, rural and married students. The knowledge scores were low irrespective of the educational disciplines of the students and the responses of medical and education students reflected the prevalence of many misconceptions regarding the timely initiation, duration and exclusivity of BF.

Conclusion: Undergraduate female students in medical and education colleges at King Faisal University have positive attitudes towards BF, yet they demonstrated low level of knowledge with several misconceptions. Promoting BF in their communities will not be possible without proper educational strategies aiming at reinforcement of the current curricular contents for the benefits of generations to come. Curricular changes aiming to promote BF and correcting the ingrained misconceptions are needed..

Keywords: Breastfeeding, attitudes, knowledge, medical, education, female students, Saudi Arabia

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Introduction

Despite much evidence on the health and social advantages of Breastfeeding (BF), and the strong advocacy of BF in primary care, many women breastfeed for a very short time, and the majority choose to bottle feed their babies. Poor BF and complementary feeding practices are also prevalent. Globally, less than 40% of infants are exclusively breastfed for the first six months of life and the majority receives some other food or fluid in the early months.¹

In Saudi Arabia there has been a considerable change in the pattern of BF in recent decades due to population transition, as a result of



advancements in socioeconomic status.² BF in Saudi Arabia has been customary;³ its duration used to exceed the age of 24 months, and solid food would be introduced as late as 12–18 months and complementary to breastfeeding.⁴ Studies from Saudi Arabia have recorded a progressive decline in breastfeeding practice and duration, especially among young mothers in urban areas^{5,6} with early introduction of bottle feeding^{7,8} and earlier introduction of solid foods.⁹ Factors influencing BF have been investigated worldwide. Associations of several socio-demographic factors,^{10,11} maternal attitudes and perceptions,^{12,13} with intended BF duration, were identified as factors explaining the initiation and duration of BF in previous studies. Studies of non-pregnant high school students suggest that attitudes towards infant feeding begin to form well before pregnancy.¹⁴

For the successful development of an effective BF promotion program, it is important to examine factors that influence women's BF decisions. Research suggests that attitudes towards BF are strong predictors of choice of infant-feeding than usually cited socio-demographic factors.¹⁵ Timing of the decision to breastfeed is also important. Studies have shown that a majority of expectant mothers make infant-feeding decisions before, or very early, in pregnancy.¹⁶ Other research has indicated that women who make a decision before pregnancy are more likely to choose BF than those who make a decision during or after pregnancy.¹² Understanding of young women's attitudes towards BF should be an early step in the design and implementation of BF interventions.

In Saudi Arabia there is little information found about attitudes towards BF among adolescents and young women, particularly non pregnant. Previous researches showed that the majority of the young Saudi women are in favour of BF initiation but with later discrepancy of their BF

practices.^{5,6} This study was designed to explore the attitudes towards and knowledge about BF of the undergraduate female medical and education students at Colleges of Medicine and Education, King Faisal University, Saudi Arabia. Students at both colleges are following a traditional form of teaching with few lectures dedicated to infant feeding and care entailing the benefits of BF for maternal and infant health. University students in Saudi Arabia compose a large proportion of the female Saudi population. Female students especially medical and education are the future mothers and future professionals as physicians and teachers who will promote the knowledge and attitude regarding the importance of BF in their respective communities.

Method and material

Setting and design: This cross-sectional study was carried among female undergraduate students enrolled in two colleges namely Medicine and Education at King Faisal University, Eastern Province of Saudi Arabia. The population of this study composed of 1492 female students enrolled along the four year program at the College of Education and 687 female students enrolled along the 6 year program at the College of Medicine, King Faisal University, Saudi Arabia. All students at both colleges were targeted for the study (with the exception of 1st year medical students as they were affiliated more to College of Science where they are attending the required courses).

Sampling:

Assuming that the attitudes towards BF is favourable among 50% of female students, with the worst acceptable of $\pm 4\%$ for precision and considering a 95% confidence and 80% power, the required sample size would be 466 students; adding 10% for non-response, the total sample size would be 513 from both colleges. Applying an appropriate sampling fraction, the minimum number required from College of Medicine was



161 and 352 from College of Education. Students were selected from both colleges using systematic random sampling method where every fifth student (20% sampling) was selected using statistical software (SPSS 16.0, Statistical package for Social Science) through employing of the students' academic number. Those selected were received an appropriate orientation regarding the objectives and impact of the study, with emphasis on their right not to participate. Study proposal and the initial data collection tool were submitted to the Research Ethics Committee, Deanship of Scientific research at King Faisal University for review and approval. Ethical clearance was granted with formal approval letters issued and directed to both colleges emphasizing the participants' right for non participation and data confidentiality. Only female investigators got access to the targeted colleges for purpose of communicating with selected students, conduction of orientation sessions and data collection in accordance to the cultural norm of the Saudi conservative society.

Ethical issues? Where the researchers got approval from? (Ethics committee). How did they got access to the field of research?

Data collection:

A self administered anonymous questionnaire was used for data collection and included the following sections:

-Socio-demographics: age in years, year of enrolment at the College, residence, family income and parental educational and occupational status.

-The Iowa Infant Feeding Attitude Scale (IIFAS): This measure was developed by De la Mora et al ¹⁷ as a measure of attitudes towards infant feeding. The scale consists of 17 items that assess attitudes toward breast and formula feeding. Using a Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree), participants respond to items regarding a variety of issues related to infant-

feeding, such as convenience, health benefits, and father's involvement. Higher scores indicate more positive attitudes to breastfeeding. The scale was found to provide a reliable and valid assessment of maternal attitudes towards breastfeeding and artificial feeding and the scores were found to be predictive of feeding intention.

-BF knowledge: This part consists of 14 items to assess the participants' knowledge about breastfeeding practices, duration, and weaning practices. The used items were previously validated by a previous primary health care based study. ¹⁸ Closed ended format was used with true/false and do not know option or multiple choice options format were used for the knowledge part.

Questionnaire administration:

Two female investigators were responsible for the data collection, selected students at both colleges were invited personally to orientation sessions (one session for each year) to explain the study's objectives, procedures and the content of the data collection tool. At the end of the session, the questionnaire was handled personally and filled in the presence of the investigators on solicited base.

Pilot testing: Items of the used data collection tool were translated to Arabic by a panel of qualified professional followed by back translation into English by another independent expert. The tool was piloted on 42 literate women who attended a nearby primary health care centre, to clarify terms and assess any potential difficulty in questionnaire administration.

During the pilot phase the Iowa infant feeding scale (IIFAS), yielded an internal consistency reliability coefficient (Cronbach' alpha) of .776 with a validity coefficient (criterion-related coefficient 'r') of .731. For the BF knowledge items internal consistency coefficient (cronbach's alpha) of .735 and criterion-related validity coefficient of .692 were obtained.



What about the validity and reliability of the tool in the Arabic language?

Data analysis:

The total number of participants was 211 medical students and 364 from the College of Education. Forms with missing of two or more items were discarded (13 Medicine and 41 Education). The total forms eligible for final analysis were 198 from the College of Medicine and 323 from the College of Education (response rate of 91.8%). Data analysis was carried using SPSS version 16.0 (SPSS Inc. U.S.A). Both Descriptive and inferential data analyses were applied when appropriate. The IOWA IIFAS was expressed using mean and standard deviation, using Mann Whitney and Kruskal Wallis for statistical comparison. For qualitative variables, frequency, proportion and percentage were used for data expression; Chi Square and Z tests were used for statistical comparison. For the knowledge part for the included students the 25th percentiles was 6.0 (out of 14 points) where 34.6% of them scored ≤ 6 , the 50th percentiles was 7.0 while 42.3% were $\geq 75^{\text{th}}$ percentiles for the knowledge score (≥ 9.0). We assumed that those with equal or more than the 75th percentile were considered more knowledgeable towards BF. Spearman's rho correlation coefficient was employed to generate the intercorrelation matrix between attitudes, knowledge and included socio-demographic variables. P value of < 0.05 was considered significant.

Results:

Table 1 shows the basic characteristics of the participants; a total of 521 female students with age ranged from 19 to 26 years, mean age was 21.6 ± 1.4 years; medical students were slightly older than education students. This table also demonstrates the distribution of students according the study years at their colleges, 55.3% were resided in urban areas of Al Hassa and 22.1%

were married (significantly more among females at the College of Education).

Table 2 depicts the summary results for the IOWA IIFAS expressed in median (mean \pm SD.) The score among medical students ranged from 23 to 69 while it was ranged from 21 to 66 among females at college of Education. Fifty one percent and 45.5% of the included medical and education students respectively, disagreed and strongly disagreed that the nutritional benefits of breast milk last only until the baby is weaned from breast milk. Around 81.0% of females at the College of Education and 92.2% of medical students disagreed or strongly disagreed that Formula-feeding is more convenient than BF, while 61.6% of education and 47% of medical students agreed or strongly agreed that formula-feeding is the better choice if a mother plans to work outside the home. About 75.0 % of education and medical students agreed or strongly agreed that mothers should not breast-feed in public places such as restaurants. Also 58.8% and 77.6% of education and medical students disagreed or strongly disagreed that breast-fed babies are more likely to be overfed than are formula-fed babies. Thirty nine percent and 54% of education and medical students respectively agreed that fathers feel left-out if a mother breastfeeds and 39.3% and 69.7% of education and medical students respectively disagreed or strongly disagreed that Formula is as healthy for an infant as breast milk. The table also shows that the score is significantly higher among those in the advanced years at both colleges, those with rural residence and married students.

Table 3 demonstrates the correct responses to the knowledge items by the colleges included. Thirty seven percent of the included students were not able to correctly identify that initiation of BF should be timely (within the 1st hour following delivery). About 45% of students agreed that BF causes maternal obesity (more among students of Education-59.4% compared to 30.3%

Medicine). More than 64% thought that BF spoils the shape of the breasts (more among Education students 74.4% vs. 55.1% of medical students), while 45.1% stated that BF is inappropriate for working mothers. About 80 % of medical students and only 46.7% of education students gave correct response regarding the duration of BF, while only 57.2% could correctly identify the duration of BF exclusivity. Sixty percent of students from both colleges gave incorrect response regarding the introduction time for weaning foods.

Figure 1 demonstrates the knowledge scores in relation to year at college; knowledge scores show a significant upward trend in relation to the year at college in medical but not among students at the college of Education. The overall scores for BF knowledge were significantly higher among medical compared to education students. Applying a cut-off for knowledge of ≥ 9 points, 95 (29.4%) and 109 (55.1%) of females at college of education and medicine respectively were more knowledgeable towards BF.

Table 4 depicts the Spearman's correlation coefficients for attitudes and knowledge scores against the basic characteristics of the included sample. Attitude scores were positively correlated with age, and year at college, while knowledge score was not significantly associated with age or years at college.

Figure 2 shows plotting of the relationship between knowledge and attitude scores by colleges. Both knowledge and attitude scores were more strongly correlated among females at the College of education than Medical college.

Discussion:

This study demonstrates that both medical and education female students have positive attitudes towards BF. Medical students in advanced years at college, those who were married regardless of their college and of rural origin showed the highest positive attitudes when compared. These

results are consistent with others carried out in the Middle East among undergraduate students in Egypt,¹⁹ and Jordan.²⁰ Ahmed & El-Gindy found neutral attitudes towards BF among undergraduates nursing students; Al Ali et al found similar attitudes among females in a public University in Jordan.²¹ In the Middle Eastern countries and especially Saudi culture which is mainly Islamic people are very supportive of BF. For the Muslim woman, Islam is more than a religion; it is a way of life pervading all aspects of the human being. The most critical determinant of Islamic culture is the understanding of and adherence to the Qur'an and the Sunnah.²² In the Islamic culture, the Qur'an provides followers of Islam with special instructions regarding the duration of suckling, weaning and rearing of infants. The Qur'an therefore promotes breastfeeding: 'Mothers shall give suck to their children for two full years for those who desire to complete the term' (*Qur'an*, 2:233). In contrast to the results of our study, using IIFAS, Darby-Carlberg found that 36% believe that formula is as healthy for infants as breast milk.²³ Another study²⁴ found that there is a large increase in the number of adults who believe that formula is equivalent to breast milk. In this study, the majority of the included students believed, regardless of their educational stream, that BF increases mother-infant bonding, and that breastfed babies are likely to be healthier than formula-fed babies. All of the above responses support the positive attitudes held by the included cohort. Fifty percent of the included students (61.6% of education and 47% of medicine) agreed or strongly agreed that formula-feeding is the better choice if a mother plans to work outside the home, and moreover about 75% of them agreed or strongly agreed that mothers should not breast-feed in public places such as restaurants, this two points addressing the most commonly encountered misconceptions previously reported in different countries.^{20,21} The attitudinal difference in response to the educational stream was also found in other study



by Singh²⁵ who assessed the attitudes of 2,500 urban college females in India and found that a majority of participants held negative attitudes toward BF, although participants from science disciplines had more positive attitudes than those from arts or commerce. Maternal employment has been one of the greatest barriers to BF. In Saudi Arabia, women's participation in the labour force is increasing due to boost of education and socioeconomic transition thus attributed to the low rate, or discontinuation of BF, among working mothers.²⁶ Although our sample had generally positive attitudes towards BF, a significant proportion of students believed that women should not breastfeed in public. This result is consistent with other studies which found that embarrassment was perceived as a major barrier to BF and BF in public was not considered acceptable by many students.²¹ O'Keefe et al²⁷ found that university students considered bottle-feeding more convenient and less embarrassing than breastfeeding; they believed that BF is a private affair and should not be done in public.

One previous study among female Saudi teachers found that the low rates of knowledge regarding the appropriate duration of exclusive BF and the time when complementary food should be introduced, in conjunction with very low rates of attending classes related to BF issues during pregnancy are important factors in limiting breastfeeding prevalence.²⁶ It also indicates the crucial role of health care providers and peer support to pregnant women and BF mothers. Such support, as well as face-to-face and pre- and postnatal classes, has been proven to be effective in reducing early cessation of BF and was a very effective way to promote BF prevalence.^{28,29}

Apart from the duration of BF, the knowledge component of this study revealed low level of knowledge and misconceptions regarding BF initiations, and practices significantly more among education students. A sizable portion of

the included students failed to identify the timely initiation of BF, with misconceptions regarding the role of BF and maternal obesity and breasts spoilage. In conjunction with other health professionals, physicians are believed to play an important role in promoting BF to women. Furthermore, BF initiation and duration increase when doctors provide information, support and encouragement to women.³¹ Although studies indicate that doctors have positive attitudes to BF, significant knowledge deficits often limit their capacity to assist BF women and their infants.^{32,33} Training for doctors about BF is frequently described as inadequate,^{14,33} with many relying on personal BF experience (of self or partner) as a main source of BF knowledge and skill development.^{32,33}

Another important point is that of the role of teachers in the Saudi community. Female school teachers comprise half of the female workforce in Saudi Arabia – 250,854 teachers out of 505,340 female employees – and they exert a tremendous socializing influence on up-coming generations.³⁴ Dissemination of BF knowledge to this population should have a striking impact on child health in the country in the short-to-medium term, as well as in the more distant future, since teachers are best suited to pass on correct attitudes and knowledge to the mothers of tomorrow.³⁵ In one study in Abha among female school teachers it was found that there were knowledge deficits in relation to BF initiation, duration and exclusivity among the majority of teachers included and this was reflected on their practices, where the number of participants who breastfed between 4–6 months was 17.9%, and 90% of the respondents did give formula to their children. In 66.7%, the children were given readymade liquid formula while in hospital and only 31% started BF their children within one hour of delivery, while exclusive BF for 6 months was reported only by 8.3% participants.²⁶

This study had some limitations that may affect the external validity of the findings. The sample was university students from one university in Saudi Arabia. Therefore, generalizability of the findings to the larger population of young adults should be done with caution. Furthermore, as higher education is frequently associated with the decision to breastfeed, university students may have higher knowledge levels and more positive attitudes than the general population. Also, the participants of the study were selected from only two colleges, therefore their perceptions may not be representative of all university students at King Faisal University. Finally, we did not examine the socio-cultural factors or curricular materials at both colleges which may have influence on the students' attitudes and knowledge towards BF.

Conclusion:

Female students in medical and education colleges at King Faisal University have positive attitudes towards breastfeeding yet their knowledge is low and mixed with several misconceptions. Promoting breast feeding in their communities will not be possible without proper educational material and experience for the benefits of generations to come. Curricular changes aiming to promote BF and correcting the ingrained misconceptions are needed.

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ANNEX

Table 1 Socio-demographics of the included female students from colleges of Medicine and Education, King Faisal University.

Variables	College: No. (%)	
	Education(N=323)	Medicine(N=198)
Year of enrollment:		
First	60(18.6)	--
Second	87(26.9)	41(20.7)
Third	94(29.1)	44(22.2)
Fourth	82(25.4)	40(20.2)
Fifth	--	41(20.7)
Sixth	--	32(16.2)
Residence:		
Urban	185(57.3)	103(52.0)
Rural	138(42.7)	95(48.0)
Marital status:		
Married	82(25.4)	33(16.7)
Single	241(74.6)	165(83.3)
Age:		
Median (mean \pm SD)	21.0(21.6 \pm 1.4)	21.5(21.9 \pm 1.3)



Table 2 Scores of Iowa Infant Feeding Attitude Scale of the included female students by colleges, King Faisal University.

Variables	Colleges: Median (mean± SD)		P value**
	Medicine (N=198)	Education (N=323)	
Year at college:			
First	--	51.0(53.1±8.4)	--
Second	55.0(57.5±5.3)	55.0(53.8±7.6)	0.009
Third	58.0(59.5±4.1)	56.0(55.1±7.4)	0.010
Fourth	57.5(58.6±4.7)	56.0(59.5±7.5)	0.945
Fifth	60.0(59.4±7.7)	--	--
Sixth	58.0(59.9±6.9)	--	--
P value*	0.001	0.001	
Total	60.0(59.5±5.9)	56.0(55.5±7.5)	0.001
Residence:			
Urban	56.0(58.9±6.9)	55.0(53.8±8.1)	0.001
Rural	61.0(60.1±4.4)	60.0(58.1±5.5)	0.006
P value*	0.149	0.001	
Marital status:			
Married	62.0(60.8±4.6)	60.0(59.3±4.3)	0.099
Single	58.0(57.2±6.1)	56.0(54.7±8.1)	0.001
P value*	0.005	0.001	

* Kruskal Wallis test, ** Mann Whitney test

Table 3 Breastfeeding knowledge among the included students of college of medicine and education, King Faisal University.

Knowledge Items	Education(N=323)		Medicine(N=198)		P value*
	Correct	Incorrect	Correct	Incorrect	
Breastfeeding should start immediately after delivery. (True)	209(64.7)	114(35.3)	121(61.1)	77(38.9)	0.046
Breastfeeding causes maternal obesity. (False)	131(40.6)	192(59.4)	138(69.7)	60(30.3)	0.008
Breastfeeding spoils the shape of breasts. (False)	84(26.0)	239(74.0)	89(44.9)	109(55.1)	0.001
Breastfeeding protects women from breast cancer. (True)	190(58.8)	133(41.2)	172(86.9)	26(13.1)	0.006
Breastfeeding should be stopped once pregnancy occurs. (False)	14(4.3)	309(95.7)	33(16.7)	165(83.3)	0.001
Breastfeeding should continue even if the infant has diarrhea. (True)	50(15.5)	273(84.5)	63(31.8)	135(68.2)	0.001
Breastfeeding is inappropriate for working mothers. (False)	120(37.2)	203(62.8)	144(72.7)	54(27.3)	0.020
Breastfeeding decreases infant's respiratory infections. (True)	128(39.6)	195(60.4)	112(56.6)	86(43.4)	0.007
Breastfeeding duration should be for ___ months. (2 years) (multiple options)	151(46.7)	172(53.3)	157(79.3)	41(20.7)	0.265
Juices and other fluids should be given at the 3rd month of infant's age. (False)	125(38.7)	198(61.3)	76(38.4)	122(61.6)	0.942
Colostrum should be discarded before initiating breastfeeding. (False)	38(11.8)	285(88.2)	92(46.5)	106(53.5)	0.001
Breastfeeding should be given ___ frequency/day vs. ___. (On demand) (multiple options)	96(29.7)	227(70.3)	113(57.1)	85(42.9)	0.001
Exclusive breastfeeding definition? (For 6 months) (multiple options)	136(42.1)	187(57.9)	143(72.2)	55(27.8)	0.045



Knowledge Items	Education(N=323)		Medicine(N=198)		P value*
	Correct	Incorrect	Correct	Incorrect	
Minced food supplements should be given before the 4th month. (False)	186(57.6)	137(42.4)	136(68.7)	62(31.3)	0.011
Total knowledge scores:					0.001**
Median (mean \pm SD)	7.0 (7.1 \pm 2.8)		8.0(8.6 \pm 2.3)		
Inter-quartile range (25th- 75th percentiles)	5.0-9.0		7.0-11.0		

* Chi square test for independent samples ** Mann Whitney test

Table 4. Spearman's rho Correlation matrix for breastfeeding knowledge and attitudes in relation to age and year at colleges as independent variables.

Variables	Year at college	Attitude score	Knowledge score
- Age	0.870**	0.162**	0.077
- Year at college		0.294**	0.043
- Attitude score			0.313**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

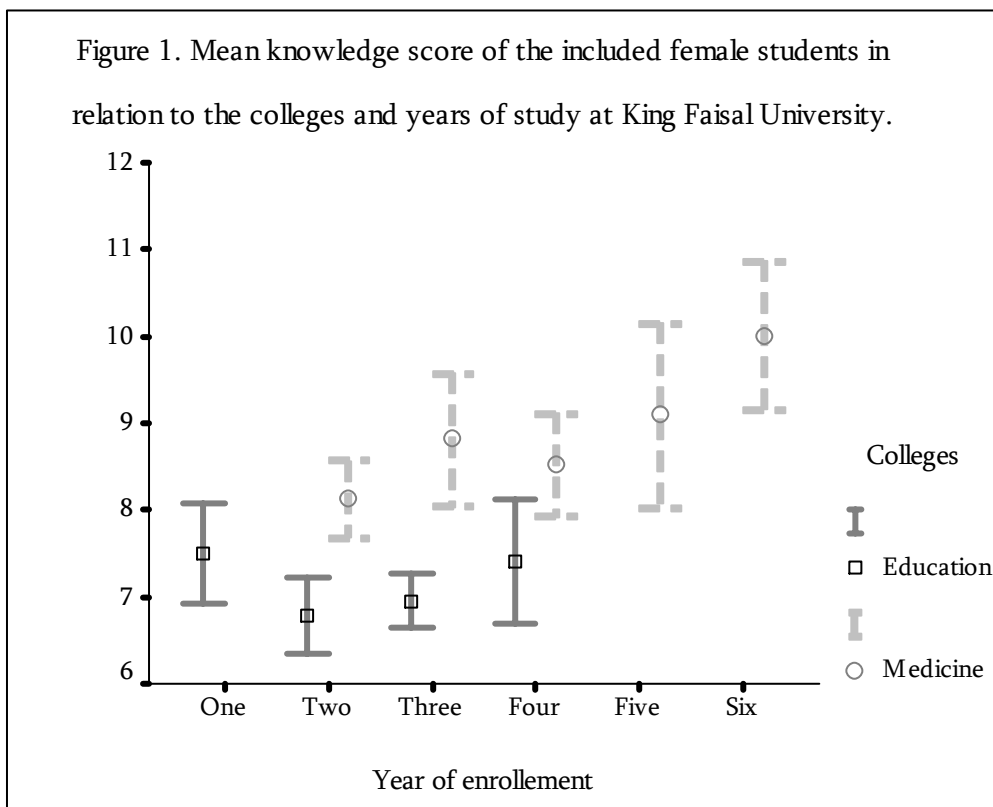




Figure 2 Relationship between knowledge and attitudinal scores among the included female students by colleges at King Faisal University

