Impact of health education on knowledge of, attitude to and practice of breastfeeding among women attending primary health care centres in Almadinah Almunawwarah, Kingdom of Saudi Arabia: Controlled pre–post study

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Abstract

Objectives: To explore the knowledge of, attitude to and practice of breastfeeding among women attending primary health care centres before and after health education.

Methods: A cohort of 360 gravid women attending primary health care centres in Almadinah Almunawwarah were selected randomly and allocated randomly to receive health education sessions or not. An antenatal questionnaire was filled in initially by both groups and filled in again after health education only by the intervention group. Postnatal questionnaires were filled in by both groups. Significant differences between the two groups

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and in the intervention group before and after health education sessions were tested. Multivariate analysis was used to detect predictors of change.

**Results:** Parameters of knowledge and attitude before the intervention did not differ between the two groups. Significant differences were found within the intervention group before and after health education and between the two groups in all parameters. Mode of delivery (odds ratio [OR], 2.5), educational level (OR, 1.6), age (OR, 5.6), parity (OR, 2.5), work status (OR, 3.3) and motivation from mothers, other relatives and health care workers (OR, 3.7, 2.1, 4.1, respectively) were significant predictors of change in knowledge of, attitude to and practice of breastfeeding.

**Conclusion:** Health education improved knowledge, attitude and practice; however, the percentage of women who initiated early breastfeeding, gave colostrum, practised feeding on demand and intended to continue breastfeeding should still be improved. Health care workers play an important role in disseminating knowledge and motivating women to breastfeed.

**Keywords:** Attitude; Breastfeeding; Health education; Knowledge; Practice

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**Introduction**

The Convention on the Rights of the Child states that access to adequate nutrition, including family support for optimal feeding practices, is the right of every child. Exclusive breastfeeding for 6 months has clearly been shown to improve infant health and development and lower morbidity from gastrointestinal and allergic diseases. Studies in developing countries showed that infants who were not breastfed were 6 times more likely to die in the first months of life than those who were breastfed. Thus, WHO and UNICEF recommend that infants who initiated early breastfeeding, gave colostrum, practised feeding on demand and intended to continue breastfeeding should still be improved. Health care workers play an important role in disseminating knowledge and motivating women to breastfeed.

Breastfeeding also has long-term effects, including better school achievement and performance in intelligence tests, reduced mean blood pressure, lower total cholesterol and lower prevalence of overweight and obesity. The evidence for these long-term effects could be used to promote breastfeeding throughout the world.

Breastfeeding also has both short- and long-term benefits for the nursing mother. Early initiation of breastfeeding reduces the risk for postpartum haemorrhage. It lowers the incidence of cancers of the breast and ovaries, has a contraceptive effect and accelerates the recovery of pre-pregnancy weight.

Despite these demonstrated benefits of breastfeeding, the prevalence and duration in many countries are still lower than the international recommendations. In all Arab countries, there is a downwards trend in breastfeeding. In 2006, the rate of breastfeeding in Kingdom of Saudi Arabia was 31%, with a downwards trend. The reasons for the decline in both the prevalence and duration of breastfeeding are social, economic and cultural, including the rapid economic changes in the Arab Gulf countries. Several countries in the region (Bahrain, Kuwait, Qatar, Oman and the UAE) show patterns similar to those in European industrialized countries, where the rate of exclusive breastfeeding during the first 6 months is below 35%.

To encourage early initiation of breastfeeding and to prevent and overcome difficulties, mothers need appropriate management and skilled help. Knowledge, support and counselling should be available routinely during antenatal care to prepare mothers, at the time of birth to help them initiate breastfeeding and in the postnatal period to make sure that breastfeeding is completely and properly established. Most new mothers do not have direct, personal knowledge of breastfeeding, and many find it hard to rely on family members for consistent, accurate information and guidance about infant feeding. Further, although many women have a general understanding of the benefits of breastfeeding, they lack information on how breastfeeding is actually done. The aim of this study was to determine whether a planned health education programme would increase the percentage of women who exclusively breastfed and increase the duration of breastfeeding. We therefore determined the knowledge of, attitude to and practice of breastfeeding among women attending primary health care centres before and after a health education programme.

**Materials and Methods**

**Study setting and population**

A controlled pre and post study was carried out during July—December 2012 with multistage sampling. Stage one consisted of random selection of six of 34 primary health care centres in Almadinah Almunawwarah after a review of official records. The investigator then trained the personnel responsible for health education in each centre to ensure that they could perform all the steps in selection of cases, giving out questionnaires and health education. Stage two consisted of recruiting a convenience, non-probability sample of 444 women (74 per centre) of normal gravid, currently married Saudi women at 28—30 weeks of gestation (primigravida or multigravida) who had no medical or obstetric risk and had not received health education sessions previously. Consent to participate was given by 360 women (60 in each centre), all of whom completed the study, with no drop-outs, giving a response rate of 81.1% (360/444). The women were then assigned to two equal groups by odd or even file number. Double blinding of both health care workers and the women was assured. Then, the group that would receive the intervention was selected randomly, while the other received routine health education during their antenatal visits.
As we found no validated, standardized interviewing questionnaire, we prepared the research tools (antenatal and postnatal questionnaires in Arabic) by the Delphi technique. The antenatal questionnaire elicited demographic and biological data and contained questions on knowledge (such as advantages and disadvantages of breastfeeding, meaning of exclusive breastfeeding and weaning, age at weaning) and attitude (such as acceptance of breastfeeding, early initiation of breastfeeding, rooming in, day and night feeding, feeding on demand, breastfeeding as a contraceptive method). It also included questions on the role of the mother, other relatives and the health team in disseminating knowledge about breastfeeding. The postnatal questionnaire included questions on practice, such as time of starting breastfeeding after delivery, rooming in, day and night feeding, feeding on demand, giving colostrum and glucose water and intention to continue breastfeeding. The responses were given as binary variables when applicable. The pilot-tested antenatal and postnatal interview questionnaires were validated by Cronbach's alpha, 0.953 and 0.892 indicating an acceptable level of internal consistency, respectively.

Ethical approval

The protocol was approved by the research ethics committee of the Medical College, Taibah University, and the Ministry of Health before field work was started. Informed written signed consent was obtained from each participant before inclusion in the study. Privacy and confidentiality were assured.

Data collection

The intervention group filled in the antenatal questionnaire at enrolment in the study and then after three health education sessions, the first at the beginning of the study, the second after 2 weeks and the third 4 weeks after the first session. The control group filled in the questionnaire only once.

Planned 30-min health education sessions were carried out by trained health educators in the selected centres. Physicians supervised the sessions to ensure that they covered the WHO guidelines for breastfeeding and the guidelines for breastfeeding of the health education programme of the Saudi Arabian Ministry of Health. Various tools were used, including lectures, posters, leaflets, pamphlets and videos, in group and individual sessions. The sessions started with general knowledge about breastfeeding and the guidelines, followed by attempts to change the attitude of the women towards breastfeeding. At the end of each session, each participant was trained through demonstrations and role modelling on positioning and correct practice, with emphasis on incorrect myths and practices. Free discussion was allowed to answer questions and correct any misconceptions.

The postnatal questionnaire was filled in once after delivery by both groups on their first postnatal visit to the centre, which was between 1 week and 2 months postpartum, the time of vaccination of the newborn.

Study instrument

Statistical analysis

Data were entered and analysed with SPSS version 17.0 and are presented as frequencies, means and standard deviations. Bivariate analysis was conducted to test significant differences before and after health education. Chi-square and McNemar tests were used to analyse qualitative variables.

To control for potential confounding, multivariate analyses were conducted with the forward stepwise (Wald) method to determine the independent predictors of knowledge of, attitude to and practice of breastfeeding. For each variable, adjusted prevalence odds ratio (ORs) and their 95% confidence intervals (CIs) were computed directly from the logistic regression analysis. Statistical significance was assumed at p \( \leq 0.05 \).

Results

Table 1 shows the characteristics of the two groups; no significant difference was found in their age, gestational age, parity, mode of delivery, education, work status or perceived contraindications to breastfeeding. Significant differences were found, however, regarding family type (\( p = 0.042 \)), anxiety about breastfeeding (\( p = 0.032 \)), their mother's role (\( p = 0.026 \)), the roles of other relatives (\( p = 0.033 \)) and the role of health care workers (\( p = 0.039 \)).

Figure 1 shows similar results for all parameters of knowledge of and attitude to breastfeeding in the two groups before the intervention. Significant differences were found within the intervention group before and after health education and between the two groups after health education for knowledge about the advantages (\( p = 0.000 \)) and disadvantages (\( p = 0.000 \)) of breastfeeding, the meaning of exclusive breastfeeding (\( p = 0.000 \)) and weaning (\( p = 0.000 \)), attitude towards breastfeeding the future newborn (\( p = 0.000 \)), initiation of breastfeeding (\( p = 0.000 \)), rooming in (\( p = 0.000 \)), day and night feeding (\( p = 0.000 \)), feeding on demand (\( p = 0.000 \)), refusing breastfeeding as a contraceptive method (\( p = 0.000 \)) and use of pacifiers (\( p = 0.000 \)).

With regard to the actual breastfeeding practice of the two groups (Figure 2), significant differences were seen in early initiation of breastfeeding (\( p = 0.000 \)), rooming in (\( p = 0.002 \)), giving colostrum (\( p = 0.014 \)), day and night feeding (\( p = 0.002 \)), feeding on demand (\( p = 0.021 \)) and intention to continue breastfeeding (\( p = 0.000 \)). No significant difference was seen in intention to give glucose water.

In multivariate logistic regression analysis, significant predictors of the impact of health education were mode of delivery (OR, 2.5, \( p = 0.005 \)), educational level (OR, 1.6, \( p = 0.038 \)), work status (OR, 3.3, \( p = 0.017 \)), type of family (OR, 2.2, \( p = 0.001 \)), age (OR, 5.6, \( p = 0.002 \)), anxiety about breastfeeding (OR, 1.3, \( p = 0.001 \)), role of relatives (OR, 2.1, \( p = 0.002 \)), role of mother (OR, 3.7, \( p = 0.001 \)) and role of health care workers (OR, 4.1, \( p = 0.010 \)) (Table 2).

Discussion

In this study, the breastfeeding initiation rate before the intervention was 61.7%, which is lower than that in a study of
female schoolteachers and that in a study of health care workers in Abha district, where the breastfeeding initiation rate was 100%. In other studies in Kingdom of Saudi Arabia, the breastfeeding initiation rate ranged from 92% to 98%, and only 31% of study participants complied with the WHO recommendation to start breastfeeding within 1 h of delivery.21

Before the health education intervention in our study, only 12.2% of the women knew the correct meaning of exclusive breastfeeding:21 this was nevertheless higher than that reported by schoolteachers in Abha, which was only 8.3%.21 That figure is also higher than those reported in other studies in Kingdom of Saudi Arabia19 and in the USA.22

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention group (N = 180) (%)</th>
<th>Control group (N = 180) (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years, mean ± SD)</td>
<td>28.6 ± 6.27</td>
<td>28.1 ± 4.13</td>
<td>0.834°</td>
</tr>
<tr>
<td>Gestational age (weeks, mean ± SD)</td>
<td>29.5 ± 6.42</td>
<td>28.9 ± 2.96</td>
<td>0.782°</td>
</tr>
<tr>
<td>Parity (mean ± SD)</td>
<td>2.6 ± 1.53</td>
<td>2.4 ± 1.33</td>
<td>0.941°</td>
</tr>
<tr>
<td>Mode of delivery: caesarian section</td>
<td>57 (31.7)</td>
<td>55 (30.6)</td>
<td>0.349°</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td>1.000°</td>
</tr>
<tr>
<td>Basic</td>
<td>25 (13.9)</td>
<td>25 (13.9)</td>
<td></td>
</tr>
<tr>
<td>Secondary or more</td>
<td>155 (86.1)</td>
<td>155 (86.1)</td>
<td></td>
</tr>
<tr>
<td>Work status</td>
<td></td>
<td></td>
<td>0.991°</td>
</tr>
<tr>
<td>Not working</td>
<td>80 (44.4)</td>
<td>82 (45.6)</td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>100 (55.6)</td>
<td>98 (54.4)</td>
<td></td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td>0.042°</td>
</tr>
<tr>
<td>Nuclear</td>
<td>85 (47.2)</td>
<td>101 (56.1)</td>
<td></td>
</tr>
<tr>
<td>Extended</td>
<td>95 (52.8)</td>
<td>79 (43.9)</td>
<td></td>
</tr>
<tr>
<td>Perceived contraindication to breastfeeding</td>
<td></td>
<td></td>
<td>0.899°</td>
</tr>
<tr>
<td>No</td>
<td>132 (73.3)</td>
<td>130 (72.2)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48 (26.7)</td>
<td>50 (29.8)</td>
<td></td>
</tr>
<tr>
<td>Anxiety about breastfeeding</td>
<td></td>
<td></td>
<td>0.032°</td>
</tr>
<tr>
<td>No</td>
<td>45 (25.0)</td>
<td>66 (36.7)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>135 (75.0)</td>
<td>114 (63.3)</td>
<td></td>
</tr>
<tr>
<td>Mother providing knowledge and support</td>
<td></td>
<td></td>
<td>0.026°</td>
</tr>
<tr>
<td>No</td>
<td>98 (54.4)</td>
<td>115 (63.9)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>82 (45.6)</td>
<td>75 (36.1)</td>
<td></td>
</tr>
<tr>
<td>Other relatives providing knowledge and support</td>
<td></td>
<td></td>
<td>0.033°</td>
</tr>
<tr>
<td>No</td>
<td>60 (33.3)</td>
<td>77 (42.8)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>120 (66.7)</td>
<td>113 (57.2)</td>
<td></td>
</tr>
<tr>
<td>Health care workers providing knowledge and support</td>
<td></td>
<td></td>
<td>0.039°</td>
</tr>
<tr>
<td>No</td>
<td>51 (28.3)</td>
<td>68 (37.8)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>129 (71.7)</td>
<td>112 (62.2)</td>
<td></td>
</tr>
</tbody>
</table>

Bold denotes only that p-value was significant.

° p for chi-square test; significant at <0.05.

# p for Student’s t test; significant at <0.05.

Figure 1: Knowledge and attitude about positive BF concepts among Group I (pre and post HE) and Group II. N.B. p-value significant at <0.05 level.
In our study, 66.7% of mothers gave colostrum to their newborns. This figure is lower than that reported in another study in Kingdom of Saudi Arabia,16,23 which was 98.7%.

In our study, 51.1% of the mothers fed their infants on demand. This is lower than that in an Egyptian study,24 which reported rates of 78.9% in Lower Egypt and 76.3% in Upper Egypt.

Rooming-in was practised by 60.6% of mothers, which is much higher than that reported in Egypt,25 where bedding-in was much commoner than rooming-in. This might be due to a limited number of infant cots in Egyptian hospitals; separation was much commoner in private hospitals.26

The baby-friendly hospital initiative was introduced in Kingdom of Saudi Arabia in 1992. Training was started in 1995, and the activities were extended from hospitals to health centres and communities. In 1997, a Saudi code of breast-milk substitutes was drafted in collaboration with related ministries, and an area breastfeeding promotion administration was established in Almadinah Almunawwarah in 2006.19 A baby-friendly hospital initiative seeks to limit the use of artificial teats and pacifiers; however, 26.1% of the mothers in our study still intended to use pacifiers, even after health education. This is in accordance with the report by Abul-Fadl et al.24 that 43.2% of mothers reported offering pacifiers to their infants. Most believed that pacifiers are the best way to soothe an infant. Only 55.6%, of the mothers in our study intended to breastfeed their infants in the correct way, i.e. exclusive breastfeeding for 6 months and continuation of breastfeeding for 24 months. This is in agreement with the report that Kingdom of Saudi Arabia has an appalling dearth of breastfeeding in comparison with other countries.26

In the present study, mothers considered that the proper age for weaning was 10.6 ± 2.7 months; this increased to 21.8 ± 5.25 months after health education. In a similar study, Al-Jassir et al.23 followed up Saudi and non-Saudi mothers for 1 year and found that, while 92% had initiated breastfeeding, 76% of the infants were introduced to bottle-feeding within 3 months; insufficient breast milk was given as the reason by nearly half the mothers. Influencing factors were found to be nationality, level of education, mixed feeding (both breast and bottle) and introduction of solid food. Labarere et al.27 also found that mothers’ lack of confidence in their ability to breastfeed and difficulties in attaching and sucking decreased the milk supply, resulting in the introduction of formula feeding and a shorter duration of breastfeeding.

Our study showed that motivation to breastfeed by mothers and other relatives was a predictor of change in knowledge of, attitude to and practice of breastfeeding, and motivation by health care workers was an even stronger predictor of change. For successful initiation and maintenance of breastfeeding, mothers need motivation, not only from their relatives and communities but also from the health system.15,16 We also found that changes in knowledge, attitude and practice were predicted by parity, mode of delivery, age, education, work status and family type. Similar results have been reported by many researchers.11–13,27,28

As this study was performed in only six primary health care centres, its results cannot be generalized owing to differences in the socio-demographic characteristics of women

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Knowledge, attitude and practice</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td>2.5</td>
<td>1.8–2.9</td>
<td>0.014*</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
<td>2.5</td>
<td>1.3–4.7</td>
<td>0.005*</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td>1.6</td>
<td>1.1–2.6</td>
<td>0.038*</td>
</tr>
<tr>
<td>Work status</td>
<td></td>
<td>3.3</td>
<td>1.6–8.8</td>
<td>0.017*</td>
</tr>
<tr>
<td>Type of family</td>
<td></td>
<td>2.2</td>
<td>1.2–7.4</td>
<td>0.001*</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>5.6</td>
<td>3.2–9.8</td>
<td>0.002*</td>
</tr>
<tr>
<td>Anxiety about breastfeeding</td>
<td></td>
<td>1.3</td>
<td>1.1–1.8</td>
<td>0.001*</td>
</tr>
<tr>
<td>Mothers’ role</td>
<td></td>
<td>3.7</td>
<td>3.3–4.8</td>
<td>0.001*</td>
</tr>
<tr>
<td>Other relatives’ role</td>
<td></td>
<td>2.1</td>
<td>1.3–3.5</td>
<td>0.002*</td>
</tr>
<tr>
<td>Health care workers’ role</td>
<td></td>
<td>4.1</td>
<td>1.3–5.9</td>
<td>0.010*</td>
</tr>
</tbody>
</table>

OR, odds ratio; CI, confidence interval; *p significant.

Dependent variable encoding: negative = 0, positive = 1.

$R^2 = 0.786.$
attending such centres. This controlled pre and post health education intervention study on breastfeeding is nevertheless the first in our region.

Conclusion

Health education improved the knowledge of, attitude to and practice of breastfeeding; however, the percentages of women who initiate early breastfeeding, practise feeding on demand, give colostrum and intend to continue breastfeeding must still be improved. Health care workers have an important role in disseminating knowledge and motivating women to breastfeed.

The health education programme should be improved to include breastfeeding concepts such as the meaning of weaning, feeding on demand and day and night feeding. In the continuous medical education programme, the performance of medical staff in breastfeeding programme must be updated to include problem-solving in order to overcome barriers to proper breastfeeding according to the guidelines. Follow-up studies on the promotion of breastfeeding are needed.

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Conflict of interest

The authors have no conflict of interest to declare.

Author’s contribution

Dr Manal Ibrahim Hanafi Mahmoud (corresponding author): idea of the research, writing protocol and questionnaire design, data collection, statistical analysis, manuscript writing and submission
Dr Shrene Shalaby: data collection and help in writing manuscript
Dr Nahed Fallatta: Data collection
Dr Hend El Ammarry: Data collection

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Appendix A. Supplementary data

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.jtumed.2013.11.011.

References


