

Full Length Research Paper

The Effects of Breastfeeding on Postpartum Weight Retention

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Women are often advised that lactation accelerates loss of the excess weight gained during pregnancy, but the evidence underlying this advice is sparse and conflicting. The aim of this study is to show the relation of full breast feeding with mothers' weight change, and to assess traditional practices in Iraqi population during breast feeding period. Longitudinal study was conducted in Babylon governorate, Iraq, during the period of 1 September, 2013 to 30 February, 2014. The collected baseline data at the time of requirement was 6 weeks and 6 months after delivery. The study sample was divided into two groups: full breast feeding (FBF) and mixed feeding group (MF). The sample was convenient, while the questionnaires include socio-demographic factors, parity, gender of baby, type of delivery, history of previous infertility, birth space, pre-pregnancy body weight, and her weight at 6 months after delivery. The questionnaires also include dietary habit during full breast feeding that includes: use of herb remedies, favorite and food they avoided. Weight (kg) and Height (cm) were measured. 175 mothers participated in the study, and they were divided into 2 groups: FBF group and MF. Full breast feeding group were younger than mixed or non- full breast feeding group. 66% of FBF had history of normal vaginal delivery with significant difference between them regarding type of delivery, and 80% of FBF group had no history of infertility compare to 63% in MF group who had history of infertility with significant difference regarding history of infertility and birth interval between 2 groups. There was no significant difference regarding pre- pregnancy body mass index between the groups and the weight change from 6 weeks to 6 months. 39.3% of FBF group reported the use of herb remedies during breast feeding fully. The most common food item avoided during full breast feeding was onion and Dates was the most favorite food. This result provide further evidence that full breast feeding promotes greater weight loss than mixed feeding among mothers even in the early months after delivery.

Key words: Weight loss, dietary habits, breast feeding.

INTRODUCTION

Obesity is a major public health problem throughout the world, with increasing prevalence in women of childbearing age. More than one-third (age-adjusted 34.9%, crude 35.1%) of U.S. adults were obese in 2011

to 2012. In 2011 to 2012, the prevalence of obesity was higher among middle-aged adults (39.5%) than among younger (30.3%) or older (35.4%) adults. Among women, the prevalence of obesity did not differ between

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those aged 40 to 59 and 60, and over 39.5% compared with 38.1%. The prevalence of obesity among younger women was lower than among either middle-aged or older women (Ogden et al., 2013).

Pregnancy and the postpartum period is a time of increased vulnerability to weight gain and body composition changes in women. Although, most women have a desire to return to their pre-pregnancy weight following childbirth, very few achieve this goal (Krummel, 2007). Furthermore, the excess weight gained in one pregnancy can have a cumulative effect on weight gain in subsequent pregnancies, thus amplifying the trajectory of weight gain and risk of obesity in a woman's lifetime (Gore et al., 2003).

It is not yet clear whether women who lactate lose the weight gained during pregnancy faster than their non-lactating counterparts. The available information comes from studies designed primarily to study the energy cost of human lactation or the relation between pregnancy-parity and the development of obesity (Walker, 1996). Few researchers have studied dietary behaviors among, exclusively breastfeeding (EB), mixed feeding (MF), or formula feeding (FF) (Rooney and Schauburger, 2002; Gunderson and Abrams, 2000). Although, BF is associated with health benefits for both mother and baby, its role in postpartum weight management remains unclear (Ip et al., 2007; Schwarz et al., 2009).

Attitudes and beliefs toward postpartum weight change have not been extensively explored, among either mothers or health professionals. Most nursing and nutrition textbooks claim that women return to their pre-pregnant weight between 6 weeks and 6 months after delivery. Practicing different beliefs and myths during puerperium has not been new in the obstetrics history. In 2007, Wang from China reported that almost 90% of postpartum women do not eat cold, hard, or sour food, 90% don't wash their hair or body at all and more than 70% women do not brush their teeth or wash their feet (Wang et al., 2007). Practices like these can have devastating effects on maternal health like increased susceptibility to anemia, hypocalcaemia and maternal infections. Traditional practices are very much prevalent in different societies (Jarrah and Bond, 2007). Knowledge about the prevailing myths will help to develop education programs targeted towards unusual dangerous practices.

The aim of this study, is to identify socio-demographic factors associated with the decision type of infants' feeding, the relation of full breast feeding with mothers' weight change and to assess traditional practices in Iraqi population during breast feeding period.

METHODOLOGY

Study design and participants

This was a longitudinal study conducted in Hilla city, Babylon governorate, Iraq, in outpatient referral center in Al- Hilla, and the convenient sample of the present study can represent the general

population of this city, during the period of 1 September, 2013 to 30 February, 2014. The collected baseline data at the time of requirement was 6 weeks and 6 months after delivery. 15 mothers out of 190 sample size mothers who met the inclusion criteria were excluded because of loss to follow up or incomplete or uncertain data, a total of 175 women participated in this study. This study was limited to two ends time period, from 6 weeks and 6 months after delivery (42 to 182 day).

Six weeks

This is the time when a mother comes out of the effects of pregnancy. During this time period, the mother has to return to pre pregnancy state and mothers who recover from surgical wounds of episiotomy or cesarean section.

Six months

Before the mother start weaning food that may affects the intensity of breast feeding to his or her baby, it is important to study the absolute effect of full breast feeding on change in mothers weight. However, because many participating mothers who were bottle feeding also breast feed, so when divided, the participated mothers had to change to full breast feeding and mixed feeding groups instead of a formula feeding group. The study sample was divided into two groups: (FBF) =full breast feeding or exclusive breast feeding (defined as the "infant receiving only breast milk; no other liquid or solid is fed) and (MF)= mixed feeding (infant receiving some breast milk and formula as well as some solids whatever the case may be). The reproductive period as reported by The Organisation for Economic Co-operation and Development (OECD) Family Database, 2012 (OECD - Social Policy Division - Directorate of Employment, Labour and Social Affairs), the mean age of mothers at first child's birth is defined as the average completed year of age of a woman when her first child is born. For a given calendar year, the mean age of women at first birth is calculated using the fertility rates for first births by age (in general, the reproductive period is between 15 and 49 years of age)

The sample was convenient for any woman present at the time of data collection, and who met the inclusion criteria for patients who were included in the study. The inclusion criteria were: age 18 to 49 years old; her infant age 6 months, single baby within birth weight ≥ 2.5 Kg, and not having any life threatening ill; not pregnant; non-smoker and not on medication which could affect their body weight such as steroid; sedentary or inactive; who agreed to participate in the study by verbal consent.

The present study take the age of mothers from 18 years old for the calculation of body mass index for adults ≥ 18 years old, to exclude low birth weight baby (≤ 2500 g) and single baby not twin that may need special care that may affect the mothers' decision about type of feeding. Physical activity level was assessed based on the recommendations of the 2005 Dietary Guidelines for Americans (United States Department of Agriculture, 2005). A score for physical activity was derived by multiplying the number of days one exercised within a week by the duration of the activity. Sedentary or inactive was defined as having an activity score of 0 to 1.4, moderately active was 1.5 and 2.9 and very active was ≥ 3.0 (Jaglal et al., 1993). Patients who did not complete the questionnaire were uncertain about their pre-pregnancy weight. Some women completed their questionnaire through the telephone to be certain about their weight from their medical and gynecological report. All patients were informed of the purpose, requirement and procedures of the study. They were also informed that their participation in this study is voluntary and they have the right to withdraw at any time. A self-structured questionnaires sheet

Table 1. Frequency and association of type of feeding with socio-demographic characteristics (n=175).

Variable	Fully breast feeding (FBF)	Mixed feeding (MF)	Total (%)	χ^2	df	p- value
Age groups						
18-30	41 (67)	26(23)	67(38)	-	-	-
>30	20 (33)	88(77)	108 (62)	33.16	1	0.001*
Total	61 (100)	114(100)	175(100)	-	-	-
Residence						
Urban	26 (43)	91(80)	117 (67)	-	-	-
Rural	35 (57)	23(20)	58(33)	24.8	1	0.001*
Total	61 (100)	114(100)	175(100)	-	-	-
Occupation						
Employed	19 (31)	59(52)	78(45)	-	-	-
Housewife	42 (69)	55(48)	97(55)	-	-	-
Total	61 (100)	114(100)	80 (100)	6.83	1	0.01*
Educational level						
Illiterate	3 (6)	17(15)	20(11)	-	-	-
Primary	16 (26)	32(28)	48(27)	-	-	-
Secondary	32 (53)	41(36)	73(42)	4.2	3	0.2
Higher education	9 (15)	25(21)	34(20)	-	-	-
Total	61 (100)	114(100)	175(100)	-	-	-

contains: socio-demographic factors (age, residence, employment, educational level, parity, gender of her baby, type of delivery, if any history of previous infertility before the last pregnancy, birth interval , pre-pregnancy body weight, and her weight at 6 weeks and 6 months after delivery).

The questionnaires also include dietary habit during full breast feeding (cause of choosing full breast feeding, use of herb remedies, used of vitamin and mineral supplement during full breast feeding, favorite food, food avoided and their causes). The measurements were weight (kg), height (cm), body mass index (BMI) (Wight (kg) /Height (m²)). This was measured according to the formula in which the weight was measured, in (kilogram) using the balanced digital scale for all subject (wearing light clothing) with an accepted error of 0.1 kg, height was measured (in meter) using a flexible tape measures to the nearest 0.5 cm with the patient standing without shoes, heels together and the head in the horizontal plane. BMI =30 or more (obese). Study questionnaires and measurement were assessed at each evaluation time point.

Ethical issue

The approval of Scientific Committee of Family and Community Department in Babylon Medical College, Babylon University, Iraq was gotten. The objectives and methods of this study were explained to all participants to gain their acceptance.

Data analysis

Recording information was checked for missing values and data entry errors. Statistical analysis was performed using Statistical Package for Social Science software (SPSS, version 17) and Microsoft office Excel 2010 was used for data processing and statistical analysis. Variables were described using frequency distribution and percentage for the patients according to their

characteristics and mean (-x); standard deviation (SD) for continuous variable. The Chi square test was used for the assessment of association between the variables studied. The p-value of less than 0.05 was significant statistically.

RESULTS

175 mothers who participated in this study were divided into 2 groups: 61 (35%) FBF and MF 114 (65%). The mean age \pm SD (years) for full breast feeding group is 32 ± 5.0 , and for mixed or non- fully breast feeding is 30 ± 4.2 . The mean self-reported pre-pregnancy weight \pm SD (Kg) for FBF is 60.5 ± 5.9 Kg and for MF 69.1 ± 4.2 Kg. The mean weight at 6 weeks after delivery \pm SD of FBF is 76.1 ± 2.1 , for MF 85 ± 3.2 and the mean weight at 6 months after delivery \pm SD of FBF is 69.5 ± 3.1 and for MF 76.6 ± 2.2

Table 1 shows the socio-demographic characteristics of respondents, FBF were younger than MF (67%) of which FBF were younger than 30 years old compared with 77% of MF aged more than 30 years old with statistical significant difference between 2 groups regarding age ($\chi^2 = 33.16$, df = 1, p-value = 0.000), and significant difference regarding residence ($\chi^2 = 24.8$, df = 1, p-value = 0.000), majority of MF live in urban area, 69% of FBF were housewife, 52% of MF employed outside their house with significant difference ($\chi^2=6.83$,df=1,p-value=0.01).

This study reported no significant difference regarding educational level between them ($\chi^2 = 4.2$, df = 3, p-value

Table 2. The maternal characteristics of the participants.

Variable parity	Fully breast feeding (FBF)	Mixed feeding (MF)	Total (%)	χ^2	df	p- value
Primiparas	34 (56)	56 (49)	90 (41.5)	-	-	-
Multiparas	27 (44)	58 (51)	85 (48.5)	0.69	1	> 0.5
Total	61 (100)	114 (100)	175 (100)	-	-	-
Gender of baby						
male	40 (65)	76 (67)	116 (66)	0.02	1	> 0.5
female	21 (35)	38 (33)	59 (34)	-	-	-
Total	61 (100)	114 (100)	175 (100)	-	-	-
Type of delivery						
Normal vaginal	40 (66)	43 (38)	83 (47)	-	-	-
Cesarean section	21 (34)	71 (62)	92 (53)	12.4	1	0.001*
Total	61 (100)	114 (100)	80 (100)	-	-	-
History of infertility						
Present	12 (20)	72 (63)	84 (48)	30.1	1	0.001*
Absent	49 (80)	42 (37)	91 (52)	-	-	-
Total	61 (100)	114 (100)	175 (100)	-	-	-
Birth interval						
≤ 2 years	18 (30)	59 (52)	77 (44)	7.98	1	0.01*
>2 years	43 (70)	55 (48)	98 (56)	-	-	-
Total	61 (100)	114 (100)	175 (100)	-	-	-
Pre-pregnancy BMI						
<30	33 (54)	64 (56)	97 (55.5)	0.06	1	>0.05
≥30	28 (46)	50 (34)	78 (44.5)	-	-	-
Total	61 (100)	114 (100)	175 (100)	-	-	-
Weight change (42-182days)						
No change	8 (13)	20 (18)	28 (16)	16.8	2	0.001*
Lost weight	39 (64)	21 (19)	60 (34)	-	-	-
Gain weight	14 (23)	73 (64)	87 (50)	-	-	-
Total	61 (100)	114 (100)	175 (100)	-	-	-

= 0.2) (Table 1). Table 2 shows the maternal characteristics of the participants. No significant difference between the groups regarding parity and gender of the baby ($\chi^2=0.69$, $df=1$, $p\text{-value}>0.5$, $\chi^2=0.02$, $df=1$, $p\text{-value}>0.5$). 66% of FBF had history of normal vaginal delivery, 62% of MF had history of caesarian section with significant difference between them ($\chi^2=12.4$, $df=1$, $p\text{-value}=0.000$) and 80% of FBF had no history of infertility compare to 63% of MF who had history of infertility with significant difference ($\chi^2=30.1$, $df=1$, $p\text{-value}=0.000$) and with birth interval ($\chi^2=7.98$, $df=1$, $p\text{-value}=0.01$). There was no significant difference regarding pre- pregnancy BMI ($\chi^2=0.06$, $df=1$, $p\text{-value}>0.5$) were 44.5% of all the participant mother were obese BMI ≥ 30 . The weight change recorded

significant difference between two groups ($\chi^2=16.8$, $df=2$, $p\text{-value}=0.000$), the mean weight loss (10.5 ± 4.1 vs 4.3 ± 3.1) with significant difference ($t\text{-test}=11.6$, $p\text{-value}<0.05$) shown in Table 2.

Table 3 shows the dietary habit during full breast feeding, 69% of full breast feeding mothers take the decision of full breast feeding after being instructed by their family members (mother, grandmother, grandfather and husband). 39.3% of FBF reported use of herb remedies during her full breast feeding period and when the mother was asked about the source of recommendation for use of herb like Ginger, Hilba and Black Seed during breast feeding, 21% said they wanted it themselves, 67% from family members and 12% from health care workers (doctors, pharmacist and nurses).

Table 3. Dietary habits during full breast feeding.

Dietary habits during fully breast feeding	Number	Percentage
Decision of fully breast feeding		
Herself	11	18
Family	42	69
Health care worker	8	13
Total	61	100
Sources of recommendation use of herb remedies		
Herself	5	21
Family and friend without medical background	16	67
Health care worker	3	12
Total	24	100
Currently taking vitamins and minerals		
Yes	12	20
No	49	80
Total	61	100
Reasons for avoiding some food		
Undesirable effect	18	29.5
Belief from family	36	59
No apparent reasons	7	11.5
Total	61	100
Reasons for favorite food		
Desirable effect	10	16
Belief from family	29	48
Un apparent reason	22	36
Total	61	100

All breast feeding mothers reported the same reason for using herb remedies which was aim to increase the amount of breast milk, and 80% of full breast feeding mothers did not take any vitamin and mineral. Avoiding food during full breast feeding, 18% reported the reason for avoiding some food was due to undesirable effect, belief from family was 59%, while 11.5% reported no apparent reasons (Table 3). The most common avoidance food item was onion and garlic (45%) (because they believe it will cause flatulence in their baby), 25% avoided spices (chili powder, black pepper) for the same reason, other foods they avoided are meat 35%, milk and dairy products 8%, bananas 15% , eggs 8%, citrus fruits 5%, canned fruit juice and soda 1% ,coffee and tea 10%. Many mothers reported that they avoided more than one food items.

The favorite foods during breast feeding are favored dates (90%), dried fruits (43%), soft drink and water

(50%) and green tea (10%). The breast feeding mothers said Dates can increase the amount of milk especially during night breast feeding. When asked about the sources of such information: 48% belief came from family, while 36% said no apparent reason for preferring such food (Table 3).

DISCUSSION

During pregnancy, women gain total body weight and accrue body fat. These body composition changes often last into the postpartum period, and thus can create significant concern for mothers who are eager to return to their pre-pregnancy weight. With obesity currently regarded as a public health problem post pregnancy, a clearer understanding of the role of BF in post partum weight management is required. This study presented that mixed feeding mothers were older than full breast feeding mothers, this finding differ from what was observed in other studies (Laura et al., 2001; Irene et al., 2008).

This study reported significant difference between the two study groups regarding residence were 80% of MF mothers who lived in urban area were compared with 43% in FBF, and no significant difference was recorded regarding the work of mothers were 69% of FBF mothers were housewife, and 52% of MF mothers were employed. Work least compatible with child care had a negative effect on breast-feeding. The negative effect of mother's work on exclusive breast-feeding was observed in some working class mothers who in lived in urban residence (Ukwuani et al., 2001). Such finding in this study can be explain by most of the working class mothers who lived in urban area and spend 6 hours daily in their work that makes them to choose MF, while working class mothers in rural residence spend less time in their work, and most of the work they do is at home which makes them to have more time to practice full time breast feeding, and no significant association regarding the educational level (p-value 0.2).

This study disagrees with other studies that have shown maternal education to be more powerful than income or employment in predicting breastfeeding (Evers et al., 1998; Celi et al., 2005; Fein and Roe 1998). Having more formal education may help parents understand the health benefits of breastfeeding and may increase the likelihood of parents to search out information about health practices (van Rossem et al., 2009; Heck et al., 2006). Reasons for the association between breastfeeding and educational level are likely complex in Iraqis' community that may be associated with knowledge, attitudes, experiences and beliefs leading a woman to a particular infant feeding choice.

The significant association regarding type of delivery between 2 groups (p-value=0.000) (66%) of FBF had history of normal vaginal delivery compared with 38% of cesarean section and 62% of MF group cesarean section.

Women with vaginal delivery were more likely to initiate colostrum feeding as compared to operative delivery. This may be because there is delay in initiating breast feeding in cesarean women due to the effect of anesthesia, and pain and in some of Babylon society due to the believe that anesthesia can affect the baby breast milk. Relative to those who had delivered at home, and few women who delivered in the hospital started breastfeeding. More research is needed to elucidate this finding. But, in any case, hospitals should give optimal guidance to mothers on breastfeeding (van Rossem et al., 2009).

Sometime ago a question arose, does childbirth and lactation gender specific? Does it affect the decision on the type of feeding? This study also reported no significant difference regarding the gender of a baby (p -value > 0.05). It was never thought a mother would use gender inequality as a reason for a particular infant feeding choice, as breastfeeding may be associated with knowledge, attitudes, experiences and beliefs of a woman. Regarding the association between history of infertility and breast feeding, this results present significant difference between the study groups ($\chi^2=30.1$, $df= 1$, p -value 0.00). Breastfeeding challenges are more common in women who have experienced infertility. It's not clear exactly why that may be, but possible reasons include the higher risk of premature birth, or hormonal problems or women with history of infertility most commonly have elective caesarian section that make the mother after delivery, prefer formula or mixed feeding . Women may also tend to have less confidence in their body and themselves as mothers after infertility, which could lead to lack of confidence in breastfeeding. Lactation consultation before the mother gives birth might help to clear infertility-related hurdles. 56% of FBF women were primiparas compared with 44% of multiparas with no significant association between the study groups ($\chi^2=0.69$, $df=p$ -value >0.05).

Sometimes women who are nursing older babies or toddlers choose full breastfeeding. This study found significant difference regarding the birth interval between FBF and MF groups were 70% of FBF mothers reported birth interval ≥ 2 years compared with 48% in MF mothers. This study has also reported no significant differences between women who practice FBF and MF regarding pre-pregnancy BMI ($\chi^2=0.06$, $df=1$, p -value >0.05). Other studies, reported pre-pregnancy body mass index (kg/m^2) (22.5 ± 3.4) (Barennes et al., 2009) with significant difference between two groups regarding weight changes ($\chi^2=16.8$, $df=2$, p -value <0.001), 64% of FBF group lost weight during the study period compared with 19% in MF group, with significant difference of mean weight loss between. This finding has also been observed in other studies that reported a direct relationship between BF and weight change (Baker et al., 2008; Gould Rothberg et al., 2011; Gunderson et al., 2008; Martin et al., 2012; Nuss et al., 2006; To and Wong

2009). Other prospective studies that examined weight change reported no significant relationship between BF and weight change (Oken et al., 2007; Lyu et al., 2009; Ostbye et al., 2012; Walker et al., 2006; Hatsu et al., 2008; Ota et al., 2008; Wosje and Kalkwarf 2004). Other studies also reported no associations between BF and weight change which was observed, tended to have small sample sizes (60 participants) or short duration of follow-up (< 3 months) (Walker et al. 2006; Hatsu et al. 2008; Ota et al., 2008).

In Iraq, there is change in eating habits during the breastfeeding period in women. The present study reported the dietary habit during full breast feeding. 69% of women who adopted full breastfeeding were based on the advice of their family compared with 19% who were advised by the health workers. The use of herbal remedies is very common among our community in Hilla city, Babylon governorate, Iraq. The study reveals that herbal products are popular as a result of a widespread belief that the preparations are natural and therefore safe. This study found that only 39% of FBF group use herbal products (Ginger, Hillba, Black seed) and 12% had a recommendation and consultation from a pharmacist, physician or nurses, and 67% of them from family and friends who had no medical background prior to the use of herbal products. It is quite possible that herbal remedies help increase milk supply. The powerful effect of family on feeding habits during breast feeding lead to increase awareness for nutritional education to all family members (husband, mother, sister and traditional birth attendants) (Bozin et al., 2008).

Ginger appears to be safe when used in food preparation, but it is advisable to avoid using large amounts as there is not enough information available about the safety of ginger while breastfeeding. Garlic may change the smell of breast milk and affect the baby. There is no information on the safety of garlic supplements in breastfeeding. Fish oil and Raspberry leaf supplements are likely to be safe for use while breastfeeding at the recommended doses. Raspberry leaf supplements should be avoided while breast feeding because there is limited safety information about it. 80% of FBF mothers do not take vitamin and mineral supplements, so it is important for nutritional educators to let the breast feeding mothers know the importance of vitamin and minerals during breast feeding. There is probably no other time in a woman's life when her nutritional intake is as important as when she is breastfeeding her baby. In addition to eating a sufficient number calories from a well-balanced diet, taking a high quality vitamin/mineral supplement can help a nursing mom guard her health so that she can produce quality breast milk for as long as she desires to breastfeed her baby. Virtually all medical professionals agree that good nutrition during pregnancy and lactation is vitally important for the health of the mother and the growth and development of her offspring. For this reason, pregnant

women and nursing moms are encouraged to eat a nutritious well-balanced diet.

In addition, pregnant women are routinely directed by health care professionals to take a multivitamin (prenatal) supplement to “ensure” adequate intake of nutrients (Haggerty, 2011; Ziesel, 2009; Picciano and McGuire, 2009). Postpartum maternal food restrictions (‘food avoidances’) are common practices, which may have important health consequences in reducing the nutritional content of breast milk. Avoiding of food during pregnancy and after delivery is common in other traditional cultures, and may substantially affect daily intakes of energy, protein and basic nutrients (Santos-Torres and Vasquez-Garibay, 2003). 59% of FBF mothers reported avoiding of some food items mostly because of believe from family members. Most food items reported to be avoided were: (45%) Onion and Garlic, they belief it causes flatulence that may spread to their baby; (35%) meat, causes constipation and worm; (25%) spices (chili powder, black pepper), causes flatulence. Some FBF women avoid banana, citrus foods, canned fruit juices and soda, and even coffee and tea from their diet. Women who were avoiding banana linked it to constipation and cough, canned fruits juices and soda to cough, coffee and tea to anemia, eggs were reported to increase vaginal secretions and worms. Milk and milk products were linked to cause constipation and sputum along with wound infection. 90% of the breast feeding mothers favorite food was Dates due to the believe that it increases the amount of breast milk, 43% of them liked dried fruits because it increases the amount of breast milk, 50% of them take soft drink and water because it improves mouth dryness and also prevent constipation, while 48% of their choices came from family members.

Health care messages have been fruitful in bringing a positive change in lifestyles. Many harmful practices during puerperium have been reported in literature and authors recommend the need of health education in this aspect (Ozsoy and Katabi, 2008; Geçkil et al., 2009; Kulakac et al., 2007).

Health care administrators have been using nutritional programs to bring a social change in behaviors and attitude of individuals, families and community. The programs should be simple and build in a way that it increases the interest and understandability to be effective in bringing a social change. Thus, carefully selected topics in area of need and then properly designed intervention programs in the form of health education can be considered as an effective tool in improving the health status of communities.

Conclusion

This result provide further evidence that full breastfeeding promotes greater weight loss than mixed feeding among mothers even in the early months after delivery. This suggests that there is need to encourage mothers to

practice full breastfeeding as a means of overweight and obesity prevention. Health education programs can successfully change the views about dietary components which can bring a healthy change in dietary habits of women.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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