Predictors of complementary feeding in infants aged 6 to 18 months: An application of Health Belief Model

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Abstract

Introduction: Complementary feeding plays a vital role in growth and development of children and prevention of malnutrition.

Objective: To determine the predictors of complementary feeding in 6 to 18-month-old infants and young children based on the Health Belief Model (HBM).

Method: This cross-sectional study was performed on 270 mothers of children aged 6 to 18 months who were randomly selected from those referred to six health centres in Andimeshk city, Iran. Data were gathered using a 53-item questionnaire based on the HBM and were analysed by SPSS statistical software, descriptive statistics, Pearson correlation and multiple regression tests.

Results: Mean age of the mothers was 29.8 ± 5.08 years and most of them were homemakers (88.5%) and had an under-diploma education (62.2%). The HBM constructs predicted a total of 28.9% of the variance of mothers' behaviour in relation to complementary feeding in children. Perceived self-efficacy (p = 0.001) and perceived barriers (p = 0.011) significantly predicted the behaviour.

Conclusions: Perceived barriers and perceived self-efficacy are the most important determinants of mothers' behaviour in relation to complementary feeding in children.

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(Keywords: Complementary feeding, child, Health Belief Model)

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preventative behaviour can increase the likelihood of doing these behaviours. In addition, it is necessary for mother to be efficient enough and utilize from reliable guidelines in order to perform healthy behaviours such as CF of kids.\textsuperscript{5,14} It is essential to accurately conduct educational needs assessment before planning and implementation of educational interventions to improve the CF of kids so that implementation of educational programs will also be cost-effective and cost-beneficial.

**Objectives**
To determine the predictors of CF in Infants aged 6 to 18 months based on the Health Belief Model.

**Method**

**Study design and sampling:** Two hundred and seventy mothers with infants aged from 6 to 18 months participated in the present cross-sectional study. The samples were randomly selected in two stages among individuals referred to health centres (HCs) of Andimeshk city, Iran. For this purpose, six HCs were randomly selected from 17 HCs. Then, a list of 50 infants, aged from 6 to 18 months, was randomly selected. Then, the names and addresses of mothers of these infants were extracted and recorded by referring to the family health files. The objectives of present study were described to selected mothers and they were invited to the study by phone. Finally, mothers participated in present study by referring to HC and completing the written consent form.

The inclusion criteria for mothers were having an infant aged 5 to 18 months old, a minimum reading and writing literacy, and a written consent for participation in the study. The exclusion criteria included kids with severe congenital anomalies or special dietary restrictions. Also, kids whose mothers had died, or were not under the care of their mother, were excluded.

**Measurements:** Data were gathered using a questionnaire in three parts. The first part of questionnaire with 10 items measured the demographic information. The second part of questionnaire included 34 items based on HBM. Perceived susceptibility, perceived severity and perceived benefits consisted of 5 items. Also, 8 items were related to perceived barriers and 9 items to perceived self-efficacy. Answers of this part of questionnaire were scored using a 5-point Likert scale (from 5 = “strongly agree” to 1 = “strongly disagree”). The cues to action were also measured using two items. The third part of questionnaire with 9 items was used to evaluate the behaviour of mothers in relation to CF of infants. The validity of questionnaire was qualitatively investigated using the panel of 5 health education and health promotion experts about simplicity and clarity, proportionality, ambiguity, necessity and scoring of items and the required corrections were made on the questionnaire based on their opinions. The reliability (internal consistency) of questionnaire was also confirmed using Cronbach's alpha, which obtained amounts that are presented in Table 2. Present study was approved by Ethics Committee of Ilam University of Medical Sciences.

**Data analysis:** Data were analysed by SPSS software using descriptive statistics, bivariate correlations and multiple logistic regression (Enter method) tests.

**Results**
270 mothers aged 19 to 47 years old with a mean age of 29.8 ± 5.08 years old participated in the present study. Most of study subjects were housewives (88.5%) with under-diploma educational level (62.2%). Also, the mean age of infants was 11.69 ± 4.13 months with age range of 5 to 18 months and most of them (44.4%) were the first child of the family (Table 1).

| Characteristic | Number (%) |
|----------------|------------|
| **Child gender** |            |
| Male           | 136 (50.4) |
| Female         | 134 (49.6) |
| **Child birth rank** |        |
| First           | 120 (44.4) |
| Second          | 118 (43.7) |
| Third or higher | 32 (11.9)  |
| **Educational level** |    |
| Elementary      | 48 (17.8)  |
| Under diploma   | 120 (44.4) |
| Diploma or higher | 102 (37.8) |
| **Occupational situation** | |
| Householder     | 239 (88.5) |
| Employee        | 21 (07.8)  |
| Self-employment | 10 903.7  |
| **Socioeconomic status** | |
| Low             | 43 (15.9)  |
| Intermediate    | 185 (68.7) |
| High            | 42 (15.6)  |

The mean score and standard deviation of HBM constructs as well as the behaviour related to CF of infants are presented in Table 2.

As shown in Table 3, all constructs of HBM had a significant correlation with behaviour. However, perceived self-efficacy ($p <0.001$, $r = 0.524$) and perceived barriers ($r = -0.263$, $p <0.001$) had the strongest correlation with behaviour.
Table 2: Means, standard deviations, number of items, obtainable score range and internal consistency of HBM constructs and complementary feeding behaviours (n=270)

| Variable             | Mean (SD)  | No. of items | Obtainable score range | Internal consistency* |
|----------------------|------------|--------------|-------------------------|-----------------------|
| Perceived susceptibility | 23.15 (2.31) | 5            | 5-25                    | 0.82                  |
| Perceived severity    | 21.76 (2.97) | 5            | 5-25                    | 0.81                  |
| Perceived benefits    | 23.22 (2.46) | 5            | 5-25                    | 0.93                  |
| Perceived barriers    | 19.68 (6.59) | 8            | 8-40                    | 0.61                  |
| Self-efficacy         | 38.94 (5.64) | 9            | 9-45                    | 0.88                  |
| Behaviour             | 33.92 (7.04) | 9            | 9-45                    | 0.91                  |

* Cronbach's alpha, SD: standard deviation

Table 3: Inter-correlations of HBM constructs and complementary feeding behaviours (n=270)

| Variable                  | 1    | 2     | 3     | 4     | 5     | 6    |
|---------------------------|------|-------|-------|-------|-------|------|
| Perceived susceptibility  | 1    |       |       |       |       |      |
| Perceived severity        | 0.564*| 1     |       |       |       |      |
| Perceived benefits        | 0.392*| 0.441*| 1     |       |       |      |
| Perceived barriers        | -0.110 | -0.062 | -0.104 | 1     |       |      |
| Self-efficacy             | 0.276*| 0.281*| 0.298*| -0.244*| 1     |      |
| Behaviour                 | 0.184*| 0.197*| 0.191*| -0.263*| 0.524*| 1    |

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

According to the multiple regression analysis, constructs of HBM totally predicted 28.9% of variance of mothers’ behaviour in relation to CF in infants. Only two constructs of perceived self-efficacy and perceived barriers could significantly predict the behaviour (Table 4).

Table 4: Multiple regression analysis: HBM variables predicting complementary feeding behaviours (n=270)

| Variable                | B    | Std. error | β    | R   | R²   | F   | sig  |
|-------------------------|------|------------|------|-----|------|-----|------|
| Perceived susceptibility | 0.011 | 0.202      | 0.004 | .957|      |     |      |
| Perceived severity      | 0.094 | 0.159      | 0.039 | .554|      |     |      |
| Perceived benefits      | 0.074 | 0.175      | 0.026 | .671|      |     |      |
| Perceived barriers      | -0.151 | 0.058      | -0.142 | .011*|      |     |      |
| Self-efficacy           | 0.580 | 0.072      | 0.465 | 0.538| 0.298 | 20.64| .001*|

* Significant at the 0.01 level (2-tailed), Dependent variable: Complementary feeding behaviours

According to the findings of the present study, 82.6% of participants reported that they have received information about their infants’ CF from at least one source. Health care staff played the major role in directing mothers about CF with 65.9%. Print media such as books and magazines with 14.4% had the lowest share in this regard (Figure 1).

Figure 1: Relative frequency (%) of external cues to action in relation to complementary feeding in study participants
Discussion

The purpose of the present study was to determine the predictors of CF in infants aged 6 to 18 months based on HBM. According to the study results, the HBM constructs predicted a total of 29% of the variance of mothers' behaviour in relation to CF. Although the overall regression model was significant, only perceived self-efficacy and perceived barriers significantly predicted the behaviours. The findings indicated that mothers are adequately susceptible to CF of infants and have perceived the serious side effects of malnutrition. Also, they had a proper perception about benefits of their kids’ CF. Other studies have reported similar results. In a study conducted by Lindsay et al (2008), mothers participating in the study properly perceived the benefits of CF but they reported many behavioural barriers such as insufficient access to healthy food and high cost of supplements for kids15. In a study conducted by Tariku et al (2015), mothers also highly perceived the threat of malnutrition for kids. However, they had a weak practice due to perceiving barriers such as lack of knowledge and skills about preparation of CF, the cost of providing CF and lack of CF acceptance by kids5.

In the present study, the perceived barriers of mothers included inadequate support of family members for providing CF, unnecessary interference of others in providing CF, lack of knowledge and skills about preparation of CF and lack of infant’s desire to CF. The findings indicate that perceiving health threat by mothers and even the high expectations and values of outcome of mothers' behaviour cannot solely lead to their desirable practice in relation to CF6-16 and it is necessary to resolve the perceived behavioural barriers by mothers. On the other hand, a positive and significant correlation between perceived barriers and self-efficacy indicates the necessity of improving mothers’ self-efficacy to decrease these behavioural barriers5,17. To improve the self-efficacy, the knowledge of mothers about principles of CF for infants and food diversification should be firstly improved in addition to following CF model provided by Ministry of Health18 and then, mothers should acquire adequate skills to prepare and maintain CF. In addition, the self-efficacy of mothers is significantly affected by supports of family and friends6. Family plays a major and the most important role in mental and emotional support of mother and is a good action cue for mothers to decide and behave in kid’s nutrition6. Lack of adequate family support can have a negative effect on self-efficacy of mothers as well as their performance in relation to CF.

According to the study results, health care staff played the major role in educating and guidance of mothers for CF in infants. Other studies confirm this finding19-22. However, much education provided by health care staff for mothers in relation to CF have not had enough effectiveness16,18 and cannot bridge the gap between the knowledge and behaviour of mothers about CF of infants16-19. Hence, educational interventions in this area should be based on accurate educational need assessment and focusing on the most important determinants of behaviour. The findings of several studies5,17 indicated the effectiveness of HBM-based interventions on the behaviour of mothers in relation to CF of infants. The results of present study and other similar studies can be considered as a suitable framework for implementing educational interventions in the field of CF of kids. However, it seems necessary to conduct further studies using HBM and other behaviour change theories to recognize the behavioural determinants of kids’ CF.

Conclusions

The results of present study indicated that only two constructs of perceived barriers and self-efficacy significantly predicted the behaviour despite a significant correlation between all constructs of HBM and mothers' behaviour in relation to CF of infants.

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