



Investigating of Mothers' Behavior Based on the Health Belief Model about Using Iron Supplementation in 6 to 24- Month Old Children in Shahrekord City, Iran

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Authors' contributions

This work was carried out in collaboration between all authors. All authors contributed equally to the study.

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ABSTRACT

Background: Anemia is one of the most important problems in children's public health. Iron Deficiency Anemia is the most common type of anemia among this group. This study was conducted to determine mothers' behavior based on Health Belief Model about using iron complementation in 6 to 24 month old children in Shahrekord city.

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Methods: This cross-sectional study was performed in 2013. Eighty three Mothers, with their children (6- 24 months) participated in the research and completed the questionnaire designed based on Health Belief Model. Validity and reliability of the questionnaire were confirmed in a pilot study ($\alpha=0.79$). The data were analyzed by software SPSS16, Spearman and Pearson correlation tests.

Results: The mean age of mothers was 28.95 ± 4.05 and most of them (44/6%) graduated from university. Awareness, sensitivity and perceived severity and also perceived benefits of most studied cases (59%) were evaluated acceptable. But the attitude of a considerable number of the cases (41%) towards removing the barriers (perceived barriers) was poor. A lot of studied cases (34/9%) had poor performance as well. There were significant relationships between awareness, education, number of children, and performance ($p<0.001$). There was also a significant inverse relationship between performance and perceived barriers. ($p<0.001$, $r = - 0.49$)

Conclusions: The results showed mothers' poor attitude about removing the barriers which were existed against giving iron to their children. Since perceived barriers have a significant role in performance, it can be concluded that this is the cause of mothers' behavior. So, it is necessary to develop educational programs in this field.

Keywords: Anemia; iron deficiency; health belief model.

1. INTRODUCTION

Anemia is defined as the reduction in the volume of red blood cells or decrease in their concentration less than what is expected in comparison with healthy individuals [1]. It is a major problem in the general health field of children. Indeed, iron deficiency anemia is the most common type of anemia in this age group [2]. Reduction in iron reserves causes an imbalance among the body physiological needs such as growth [3]. Up to the age of 5 months, in term children, body growth is developed with use of iron reserves. But to maintain the balance of receiving iron, taking supplementary amount of iron is necessary [4]. Low levels of iron intake may affect central nervous and muscular systems so that it can disturb the function of gastrointestinal tract and lymphocytes. Some studies have shown that anemia is a risk factor for infection [3,5,6]. Iron deficiency anemia, even in mild cases, makes serious disorders including movement disorders and impairment in speech, learning and focus in children [6]. Therefore, infants and children need additional iron for the growth of their body tissues. The prevention of Iron deficiency anemia leads to increase body physical power, reduce the prevalence of infections and its subsequent mortality and morbidity. This can be considered as one of the most precious investment in the long period of time in the country [7]. Sobhanian and Prandavar's study showed that 60% of patients with iron deficiency anemia were 1 -2 years old and more attention to use iron supplements should be taken in these ages [8]. The researchers, in Iran, have studied the prevalence

of iron deficiency. Its prevalence in 9-24month old babies in Rafsanjan city [2], among the children less than 5 years old in Lorestan, in 6-36 month old babies in Kashan and 1-5 year old children in Kerman [1] were 5/1,8/31,6/57,3 and 22/5% respectively. Nowadays, iron supplements are widely found in Iran. However, some mothers refuse to give iron drops to their infants. As a result, it is very necessary to educate the parents in order to increase the health level of individuals in the society [9]. The study of the factors influencing the use of iron supplements in children seems to be essential as well. For achieving the purpose of this study, a questionnaire was designed based on Health Belief Model (HBM). In this project, health education encouraged the individuals, families and society for making the decisions related to health issues. The value of health education depends on the efficiency of the program and qualified application of health education models and theories [8]. Health Belief Model has an important role in preventing diseases. Its constructs consist of perceived sensitivity, perceived severity, perceived benefits and perceived Barriers [10]. In this model, mothers sensitivity for taking preventive measures to control iron deficiency anemia in their children (perceived sensitivity construct), their sensitivity and seriousness of this threat (perceived sensitivity construct) their belief about the usefulness of iron drop (perceived benefits) and also their belief in some factors hindering them from the targeted behavior (like black tooth), the possibility of changing their viewpoint about such these side effects (perceived barriers) and, finally, their determination to consume iron drop

for their kids were assessed. So, the influencing agents affecting iron drop usage for children were recognized according to these models' constructs. Considering what was mentioned above, and low efficiency of educational activities, this study was designed to evaluate mothers' behavior based on Health Belief Model to use iron supplement among 6-24 month old children.

2. PATIENTS AND METHODS

In this descriptive-analytical study conducted in 2013, the list of all health centers of Shahrekord City was provided. Then, one center was selected randomly and the mothers having 6 to 24 month old babies and monitored in this center were investigated by use of census method. Those cases who moved from the area and did not complete all the sections of the questionnaire were excluded from the study. The validity of the questionnaire was approved by six pediatricians and health education experts. The questionnaires were completed by 15 mothers to assess the clarity and intelligibility. The reliability of the questionnaire was also calculated and the Cronbach's Alpha was measured $\alpha=0.72$, for knowledge related questions, $\alpha=0.76$ for sensitivity, $\alpha=0.77$ for perceived intensity, $\alpha=0.82$ for perceived benefits, $\alpha=0.79$ for perceived barriers and $\alpha=0.72$ for performance. The questionnaires were handed in the mothers by the researchers and they answered the questions by themselves. This questionnaire consisted of different sections; 5 questions for demographic data, 10 questions for knowledge assessment, 20 questions for sensitivity, intensity, benefits and barriers (health belief model) and 5 other questions to assess performance. Each correct answer to the knowledge questions was given one point and "I don't know" or incorrect answer was given zero points. 20 questions including HBM constructs were designed by use of likert scale (from "completely agree" to "totally disagree") and each answer was given zero to four points. The performance questions were based on self-report and each had four choices ("no", "sometimes", "most of the times" and "always"). Each answer was given zero to three points. Finally, the total score of each segment was converted into percent. Data were analyzed by Spearman and Pearson tests and using software SPSS 16. Pearson correlation test was used to determine the relation between performance and knowledge and perceived barriers. In addition, Spearman test was applied to find the relation

between mothers educational level and HBM constructs and their own performance.

3. RESULTS

Eighty three patients participated in this study. Mothers' mean age was 28.65 ± 4.05 . Most of studied cases (47%) graduated from high school. Eighty three % of these cases were also housewives. The mean and standard deviation of knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers and performance scores were 56.25 ± 14.28 , 62.04 ± 12.56 , 62.53 ± 11.10 , 68.73 ± 13.78 , 62.10 ± 22.56 , 46.82 ± 25.35 respectively. The mothers frequency percentage, based on good, average, and weak situation, for every one of model constructs and most of studied cases had average situation in most of constructs. The most vulnerable items were related to perceived barriers (41%) and performance (35%) respectively. The least weakness was seen in perceived benefits (0%). Furthermore, more than 59% of studied cases had good attitude about benefits which they may gain by using iron drop. The relation between HBM model constructs with education, knowledge and performance were shown in table one. There was no any significant relation between mothers education level, the constructs of the model and performance (Table 1).

There was a significant and direct relation between knowledge and performance so that as the knowledge of the mothers and also their performance improved.

Performance = $B_0 + B_1$ knowledge \longrightarrow
 performance = $2.299 + 0.791$ knowledge
 ($r = +0.446$, $R^2 = 0.199$, $p < 0/001$) (Fig. 1).

There was a significantly inverse relation between performance and perceived barriers as well ($r = -0.488$, $R^2 = 0.238$, $p < 0/001$) (Fig. 2).

performance = $B_0 + B_1$ barriers \longrightarrow
 performance = $80.881 + (-0.548)$ barriers.

4. DISCUSSION

Iron deficiency anemia in children is a public health problem in the world. In 2002, the World Health Organization ranked this problem as the seventh most important preventable risk in incidence of disease and death [11]. This was the first time that HBM was used for studying iron deficiency anemia in children. Since it was not found any research similar to the present one, other studies about iron deficiency anemia and

Table 1. Relationship between education, knowledge and performance with the health belief model

| Performance | | Knowledge | | Education | | Variables |
|-------------------------------|---------|-------------------------------|---------|-------------------------------|--------|--------------------------|
| Significance level of Pearson | | Significance level of Pearson | | Significance level of Pearson | | |
| r=-0.00 | P=0.97 | r= 0.12 | P=0.27 | r= 0.18 | P=0.10 | perceived susceptibility |
| r=0.08 | P=0.44 | r= 0.11 | P=0.28 | r=0.09 | P=0.41 | perceived severity |
| r=0.19 | P=0.07 | r= -0.03 | P=0.76 | r= 0.05 | P=0.50 | perceived benefits |
| r= -0.49 | p<0.001 | r= 0.06 | P=0.57 | r= -0.11 | P=0.32 | perceived barriers |
| R = 1 | | r= 0.44 | p<0.001 | r= 0.08 | P=0.44 | performance |

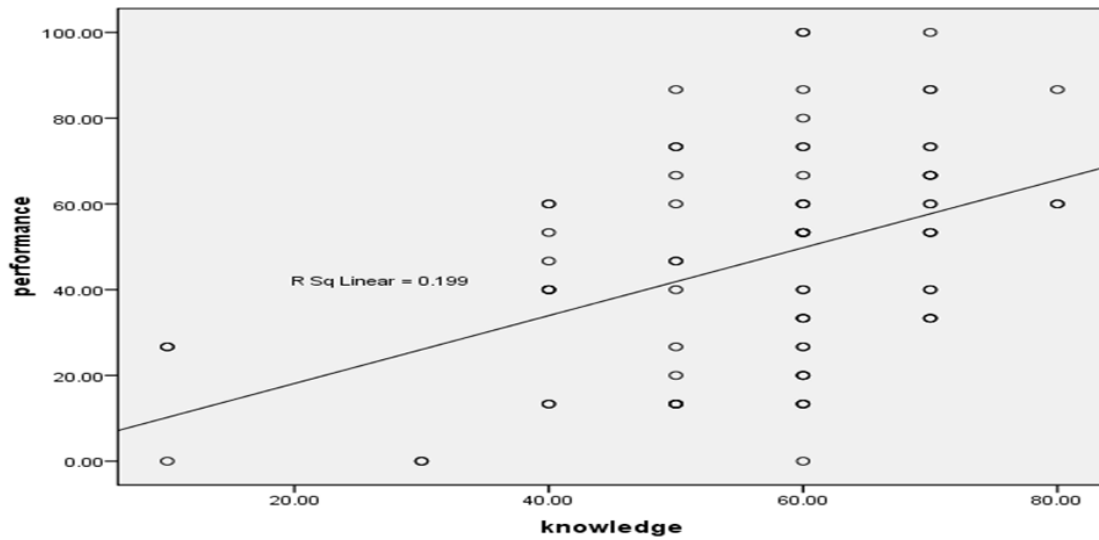


Fig. 1. Linear regression of knowledge and performance

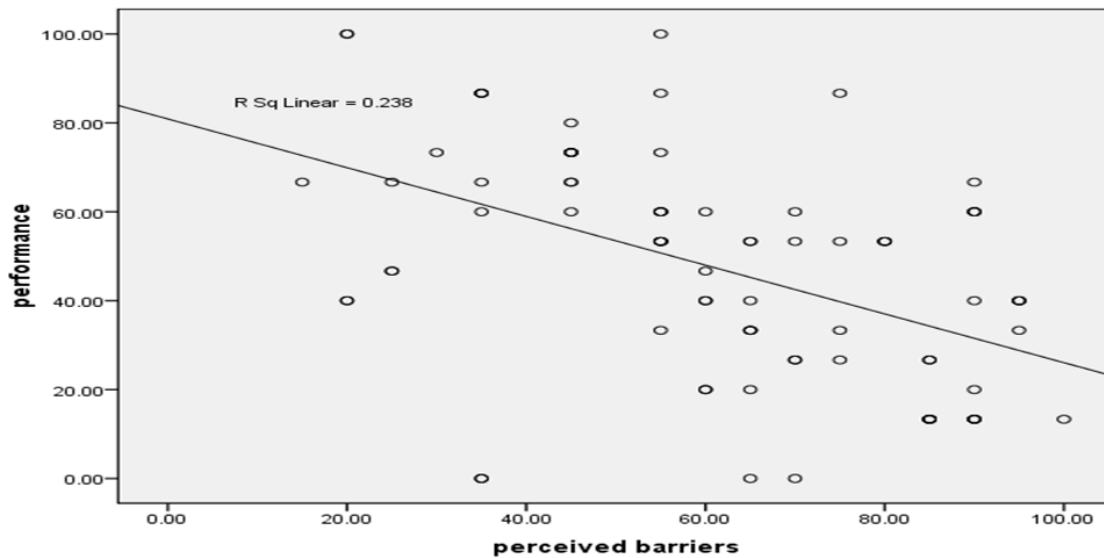


Fig. 2. Linear regression of perceived barriers and performance

health education have been stated. In this investigation, some of participants graduated from high school which this finding was similar to the results of Jafari [6] and Naimi et al. [12] studies. In Timpa et al. [13] study occupation and parents education level were considered as the environmental risk factors for iron deficiency anemia among 12-24 month old babies living in Greece. Masudpur et al. [9] demonstrated that parents education level is an important factor in using iron drops. They also showed that despite iron drops are distributed free of charge in Iran, only 61% use it regularly. Therefore, it is important to focus on this issue more [9]. One of the cheapest and consequent methods to promote the use of iron includes training the mothers to change their attitude towards the importance of this issue, which is the first step towards implementing proper behaviors. In this study, average knowledge score was moderate. Since health centers have to train parents of 6 - 24 month old children, it is expected for them to have positive attitude towards iron deficiency anemia. So, in Naimietals' study [12] mothers knowledge about use of iron supplements was relatively good. However, in Mazloumi's [14] study, results showed no correlation between knowledge and preventive behaviors. In this research, there was a direct significant relation between knowledge and practice. Iron consumption was more favorable in mothers having higher awareness. This finding proved that an increase in mothers knowledge was correlated with preventive behaviors. However, to achieve the desired behavior, a change in the attitudes and motivation is required. Hezavei et al. [15] showed in their study that an individual's attitude is the best predictor for preventing iron deficiency anemia. They also demonstrated that the main reason for not consuming iron supplements was due to their side effects. Consequently, training programs must focus on how it should be consumed and how to control the side effects [15]. In this study, a significant and inverse relation was found between perceived barriers and mothers behaviors. It seems that the barriers which avoid the use of iron should be removed. In our study, we aimed to overcome these concerns by teaching the best ways of iron consumption, ways to prevent complications, poor taste and malodor, and how to prevent the teeth from becoming black [12]. Masudpur et al. [9] showed in their study that the most common reason of irregular consumption of iron drop is its side effects such as becoming black appearance of teeth. Hence, they suggested training mothers about how to use the

drop without being affected by complications. In Gholamietals' investigation, the main reason of not consuming the iron drop included baby vomiting and his/her refusal. The most common cause of irregular use was also parents forgetfulness [16]. Fesharakinia et al. [17] showed that the most common cause of avoiding iron drops was their gastrointestinal problems including vomiting and diarrhea. They also concluded that educating parents about using iron drops is necessary. Average scores of perceived severity and susceptibility were moderate up to high levels. Mothers attitude about the perceived severity and threat of irregular or lack of iron consumption and its consequences such as being caught by iron deficiency anemia was average to acceptable levels. The mean score of iron drop consumption benefits was higher than average levels. It can be said that attitude was relatively acceptable. The results of mothers behavior monitoring showed that performance scores were lower than moderately acceptable level. Although, in Jafari et al's [6] study, attitude was positive, performance was not good. They recommended to hold training programs to improve mothers performance towards this issue. Tatala and his colleagues believe that half of school aged children suffer from anemia [18]. Some researchers attributed the anemia in school age to iron deficiency in last years. Anemia in toddler and pediatric periods causes to have this problem in the next year [19]. Since children growth rate is considerably fast, iron deficiency makes irreversible and problematic complications for them [20]. By prescribing iron supplements, this disorder can be prevented and also treated [21]. Hezavei et al. [15] showed in their study that preventing IDA according to PRECEDE model resulted in behavioral change and improved performance. Shakerinejad et al. [22] showed that increasing the knowledge and attitude of guidance school and high-school girls led to improve performance. The results showed that the average scores of mothers performance were lower than their knowledge and dimensions of the Health Belief Model [22].

5. CONCLUSION

The Knowledge level of the mothers and perceived barriers they find against themselves to use iron supplements had a significant role in their performance. Therefore, we recommend to health centers to conduct regular educational programs about stating the importance of iron

supplements for the mothers with the cooperation of health experts.

CONSENT

All authors declare that written informed consent was obtained from the enrolled patients.

ETHICAL APPROVAL

Not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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