The effect of mothers education program based on the precede model on the mean weight in children (6-12 months) at health centers in Shiraz, Fars province

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Abstract

**Background:** Growth retardation in children is a result of nutritional ignorance, inappropriate care, and inadequate monitoring of growth monitoring. This study was performed to assess the effect of mothers education program based on the precede model on the mean weight of children (6-12 months) at health centers in Shiraz, Fars Province.

**Methods:** This quasi experimental study was conducted on 120 mothers (60 in the experimental and 60 in the control group) with single child and exclusively on breast feeding who were cared by health centers in Shiraz, Fars province. The data were gathered through a questionnaire which included demographic characteristics, the components of the precede model (knowledge, attitude, enabling as well as reinforcing factors, and maternal function) and child weight. Educational intervention was performed during 6 sessions each of which lasted for 55 to 60 minutes. The questionnaire was completed by the experiment a land control group before and 4 months after the training program.

**Results:** The results showed that the educational intervention program in the experimental group caused significant increase in the means of knowledge (p<0.001) and attitude scores (p<0.001). This study showed that enabling and reinforcing factors (and training sessions), performance score of mothers as well as weight of children among experimental group were significantly higher than control group (p=0.01).

**Conclusion:** The results of this study can be used as a guideline prevents growth retardation in health centers and other related organizations.

Keywords: Health education, Precede model, Growth retardation, Children.


Introduction

Today’s children are valuable human resources for future; and how they are raised today guarantees the quality of human resources in future (1). In April 2005, the World Health Organization (WHO) chose the motto “Let’s care for all mothers’ and children’s health”, which implies the vast interest of nations as well as governments toward children (2). Children and mothers are actually the vulnerable groups of the society and include almost 70% of the population in developing countries. Growth retardation is usually manifesting the malnutrition in the first years of life. Studies reveal that nearly 25% of children under 5 years old in our country suffer from different degrees of underweight condition (3). The easiest way to understand growth pattern children and evaluate their health is to

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monitor growth pattern – as the first step – the malnutrition for both mothers and chil-
dren should be investigated at the same
time, enables them to timely (4) What fol-
lows includes the steps which should be
taken toward the growth monitoring:

1. Engaging mothers in weighing their
children.
2. Identifying the children with growth re-
tardation.
3. Questioning the mothers about the af-
fordable food as well as the quality food
they consume.
4. Making the mothers aware of the nutri-
tion provided for their children (5).

Therefore, mothers are highly important
since they are considered as the target
group to be trained in order to monitor their
children’s growth regularly and prevent
growth retardation, and they must be aware
of the issues (6).

Health education is defined as the
knowledge and the art of directing people’s
attention toward learning process to de-
velop the desirable behavior to reach health;
therefore, it is considered as a helpful
method in creating motivation and modifies
the incorrect functions (7). The first step in
designing an educational program is select-
ing a health education model which starts
the program on the right way and guides it
to the evaluation phase. In the present
study, the Precede model was used. Poss-
able outcomes of an educational program are
projected by this model, so planning is
from a whole to the details.

Nonetheless, before selecting a model for
the health education program, its objectives
as well as components must be studied. The
precede model emphasizes the process of
designing the program (8). The Precede
model was unique since it starts by the ac-
tive involvement of the target community
in order to identify its final results and then
goes back to identify the factors which
were prior to those results (9,10). Salehi et
al showed that nutritional behaviors could
be improved using education based on Pre-
cede model (11). Improvement in breast
feeding behavior using education based on

Precede model was reported by Baghiani
Moghadam (12). Other study also reported
that this method could increase nutritional
knowledge of preschool children (13).

Based on what was mentioned above, the
Precede model was used in the present
study in order to achieve more effective
results. The present study, therefore, aims
to determine the effect of mothers training
program on growth adjusting and monitor-
ing – based on some components of the
precede model – on the mean weight in
children (6-12 months) at health centers in
Shiraz, Fars Province.

Methods
Mothers and 6-12 months old children
who had referred to health centers in Shiraz
participated in this interventional study in
2011. The inclusion criteria were the chil-
dren’s being single, benefiting exclusively
from breast feeding, and not having any
specific diseases such as: congenital and
genetic diseases. In addition, the exclusion
criteria were the mothers’ not being inter-
ested in taking part in training classes, the
children’s being fed by formula, having
chronic diseases, being hospitalized, and
having accidents. The population under
study included 120 mothers who had 6-12
months old children.

Four health centers were randomly selec-
ted from all health centers located in Shiraz,
Iran. Then, 30 eligible mothers were chosen
from each health center. The samples were
chosen by referring to the lists provided by
the office of child care. Of the four selected
health centers, two were considered as the
control and two as the experimental group.

In order to gather the data, a question-
naire, was designed based on the precede
model. This model provided a framework
which clarifies the factors affecting the precede
model in identifying the behavior, such as the predisposing factors
(knowledge, attitude, etc.), enabling factors
(availability of resources, and skills), and
reinforcing factors (the effect of others,
family members, peers, etc.), in identifying
a training program. The questionnaire con-
stituted of 6 sections including demographic

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characteristics, questions on knowledge, attitude, enabling factors, and reinforcing factors, questions on maternal function, and measuring the children’s weight.

The questionnaire was designed after studying a great number of books and articles. Also, it was checked by the specialists in health education, and then their opinions on the validity of the questionnaire were applied (evaluated by two dieticians, an epidemiologist and two health education specialist for the assessment of face and content validity). Moreover, in order to measure the reliability index the questionnaire was completed by 20 mothers and alpha Cronbach’s coefficient of 84% obtained (a pilot study was also performed on 30 subjects).

Twenty six Questions regarding knowledge were scored from the lowest to the highest level from 1 to 5. There were also 14 questions about attitude with responses ranged from completely disagree to completely agree which scored from 1 to 5, respectively. Responses to questions regarding capability and reinforcing factor and maternal functions were also scored from 1 to 4.

The questionnaire was given to the participants of both groups. Data was collected by trained interviewers. Then, based on the gathered data, the selected mothers in the experimental group underwent the educational intervention. This intervention was conducted in 6 sessions each of which lasted for 55-60 minutes. Each session included giving speeches, question and answer, showing movies as well as slides, and practical teaching for preparing supplementary food. Mothers were also trained on the nutrition by food additives, appropriate pattern of nutrition, gradual variation in food, and growth monitoring. The children in both groups were weighed before and four months after the educational intervention.

**Statistical Analysis**

The data were analyzed by the SPSS statistical software version 18. Descriptive statistics was used to describe the characteristics of the subjects and distribution of variables involved in the study. Based on the type of explanatory and outcome variables chi-squared test, independent and matched t-tests were used for data analysis in this study.

**Results**

Both groups under study were not significantly different regarding age and household size (Table 1). Patients’ education level was categorized as secondary and high school and patients’ job was housewife or employee. Education and job were not also different between the two groups under study (Table 2).

The results of the present study revealed that, before the intervention, no statistically significant difference was found between the two groups regarding the means obtained for knowledge, attitude, enabling factors, reinforcing factors, and maternal functions to prevent the growth retardation, and to evaluate the mean of the children’s weight.

**Table 1.** Demographics characteristics of the participants in experimental and control groups (Age and Household size)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group (Mean±SD)</th>
<th>Control group (Mean±SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>24.8±4.22</td>
<td>29.6±1.10</td>
<td>0.17</td>
</tr>
<tr>
<td>Household size</td>
<td>3.78±1.01</td>
<td>3.67±0.97</td>
<td>0.09</td>
</tr>
</tbody>
</table>

**Table 2.** Demographics characteristics of the participants in experimental and control groups (Education and Job)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Experimental group (N %)</th>
<th>Control group (N %)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Secondary school 37(61/66)</td>
<td>35(58/33)</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>High school 23(38/33)</td>
<td>25(41/66)</td>
<td></td>
</tr>
<tr>
<td>Job</td>
<td>Housewives 58(96/66)</td>
<td>56(93/66)</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>employees 2(3/33)</td>
<td>4(6/66)</td>
<td></td>
</tr>
</tbody>
</table>
Four months after the educational intervention, however, the results of the matched t-test revealed both a great increase and significance difference in the mean of knowledge scores obtained by the experimental group (p<0.05). Moreover, the mean of the mothers’ attitude to monitor growth and preventing the growth retardation revealed a significant difference four months after the educational intervention (p<0.001). This shows the great impact of education on mothers’ attitude. Regarding the enabling and reinforcing factors, also, a significant difference was found between the two groups after the intervention (p<0.05). The results of the t-test also depicted that the maternal function on growth monitoring and preventing the children’s growth retardation four months after the educational intervention was significantly different in comparison to the period before the intervention (p<0.05). (Table 3) In addition, four months after the educational intervention, the mean of the children’s weight increased in both groups; however, the increase revealed to be more significant in the experimental group compared to the control group (p<0.05) (Table 4).

Discussion
In general, a significant increase in the mean of the overall knowledge was observed in the experimental group, which shows the great impact of the educational intervention. The results of the present study are in line with the results obtained by Hazavehei on the relationship between increasing the mothers’ knowledge and IDA in 1-5 year-old children (14), Soltani on preventing the growth retardation among children in Tabriz (15), SharifiRaad on increasing the students’ knowledge of intestinal parasitic diseases (16), and Shakouri on controlling IDA in high school girl students (17).

Shojaeizadeh et al. conducted a study about IDA conclusion that a qualified educational program which is accompanied by group discussions leads to the increase in the knowledge score. Moreover, sufficient amount of knowledge about an issue can result in the importance as well as the belief toward that issue and, consequently, develop a positive attitude (18).

In general, after the educational intervention, the mean of attitude scores has increased in the experimental group, which reveals the effect of the precede model on increasing the positive attitude. The results are in line with the results obtained in the studies conducted by Hazavehei (14), Sabzmakers on the increase of the patients’ attitude scores after the coronary heart bypass surgery (19), and Shakouri (17).

In the precede model, predisposing factors such as attitude are prior in behavior and, at the same time, are considered as behavior’s stimulating factors. In the present study, also, the positive attitude has resulted in appropriate maternal function for health monitoring and preventing the growth retardation.

The results of the present study depicted a significant difference between the two

<table>
<thead>
<tr>
<th>Variable</th>
<th>Before the intervention</th>
<th>Four months after the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group</td>
<td>Experimental group</td>
</tr>
<tr>
<td>Knowledge</td>
<td>65.2±11.8</td>
<td>66.8±11.3</td>
</tr>
<tr>
<td>Attitude</td>
<td>22.4±2.01</td>
<td>25.2±1.9</td>
</tr>
<tr>
<td>Enabling factors</td>
<td>9.2±0.85</td>
<td>8.95±0.92</td>
</tr>
<tr>
<td>Reinforcing factors</td>
<td>33.26±10.62</td>
<td>32.6±10.62</td>
</tr>
<tr>
<td>Maternal function</td>
<td>6.74±1.12</td>
<td>6.42±1.73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Before the intervention</th>
<th>Four months after the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group</td>
<td>Experimental group</td>
</tr>
<tr>
<td>Weight</td>
<td>6830</td>
<td>6950</td>
</tr>
</tbody>
</table>
groups regarding the enabling factors. Similar results were obtained in the studies conducted by ShariffiRaad on the relationship between increasing the enabling factors and decrease in the intestinal parasitic diseases (16) and Zigheimat on the effect of educating the epileptic patients (20).

The results of the present study, also, revealed a significant difference between the two groups regarding the reinforcing factors, which shows the effect of utilizing the precede model on increasing the reinforcing factors. This is in line with the studies conducted by Zigheimat on Epilepsy (20), Shakouri on controlling IDA in high school girl students (17), and Hazavehei on controlling IDA in 1-5 year old children (14).

Regarding the maternal function in monitoring health and preventing the growth retardation, the present study revealed a significant difference between the two groups, which proves the effect of knowledge, attitude, and reinforcing as well as predisposing factors on the rate of maternal function. The study conducted by Baghiani-Moghadam et al. in Yazd province (12) as well as a study in Chile (21), also, revealed that education based on the precede model increases the mothers’ breast feeding behavior. Therefore, growth monitoring can encourage the mothers to perform positive activities. In order to achieve this aim, sufficient amount of time must be taken into account for monitoring. Cooperation of the mother and the family has a major role in the child’s growth. It is also quite important to strengthen the mothers, increase their motivation, discuss the child’s growth with them, and receive their opinions (22).

In a study which was conducted by Emami and Aref on the rate of maternal function in using iron as well as supplementary vitamins for infants, it was shown that the mothers had a moderate function regarding this issue (23). The mean of the scores obtained for the maternal function significantly increased after the educational intervention in Hazavehei’s study on controlling IDA in 1-5 year-old children using the precede model (14). Also, James et al. as well as Booth et al. performed studies in England and reached similar results; i.e. conducting the Iron supplementation program by mothers leads to success in IDA control strategy. His aim can be achieved by developing an effective relationship between the mothers and the health staff (24, 25). Dabagh and Green, also, conducted a study on the application of the precede and the proceed models – as the framework of designing the programs as well as policies in preventing diarrhea in children – in Arab countries. In line with the objective of the study, the precede model was utilized as a diagnostic instrument for identifying and emphasizing the factors which affect the causes as well as controlling diarrhea in children in rural areas (26).

The results of the present study revealed a significant difference between the control and the experimental group regarding the increase of weight. Although the increase in weight was observed in both groups, the experimental group revealed more increase in weight in comparison to the control group.

Kilaru conducted an interventional study – which included growth monitoring consultation accompanied by teaching nutrition to mothers – and came to the conclusion that the children in the experimental group gained more weight after the intervention (5).

In his study, Kumar considers starting the breast feeding 6 hours after birth and inappropriate supplementary food as the risk factors for underweight (27). This might be due to the fact that the mothers had not been educated in this respect.

In a study which was conducted on children in India, 60% of the children had underweight, which had happened because of the mothers’ lack of knowledge about nutrition, their unhealthy habits, and undesirable cultural functions (28).

The effectiveness of the precede model was also confirmed in a study which was conducted in Vietnam in order to evaluate the need for educational interventions with respect to children’s nutrition, breast feed-
Precede model on the prevention of growth retardation

These results, all, prove the effectiveness of the precede model in educating the mothers on the children’s gain of weight.

One limitation of this study is that we did not have control over the study subjects regarding their contacts. Any contact between individuals in intervention and control group can affect their behaviour and the final outcome of the study.

Conclusion

Educational programming based on the Precede model positively affects different aspects of mothers’ behavior in children’s growth monitoring. The results of this study indicated that mothers training program based on the precede model was highly effective on the prevention of growth retardation in the study population.

References

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