The Effect of Learning Module Program on Mothers’ Ability to Adapt to New Foods, Feeding Styles, and Self-efficacy to Their Children with Avoidant Restrictive Food Intake Disorder

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Abstract

BACKGROUND: The education to improve a mother’s knowledge is deemed to be important because it may improve children’s nutritional status.

AIM: The aim of this study was to examine the effects of learning module program on the mothers’ ability to adapt to new foods, feeding styles, and self-efficacy to their children with avoidant restrictive food intake disorder (ARFID).

METHODS: Quasi-experimental design was used to evaluate the effectiveness of learning module program. Fifteen mothers of experimental group were given four meetings within 4 weeks. Each meeting ran about 50 min. Fifteen mothers of control group were conducted home visit and received twice education about the health principals of feeding children. Both experimental group and control group had pre-test and post-test. The data were analyzed using Chi-square test, Fisher’s exact test, and Mann–Whitney U-test.

RESULTS: The participants of the experimental group have shown bigger surge of new foods adaptation (t = –2.973, p < 0.003), feeding style (t = –4.646, p < 0.001), self-efficacy (t = –3.652, p = 0.001) than the control group has.

CONCLUSION: The findings indicated that the learning module program was deemed to be effective to improve mothers’ ability to adapt to new foods, feeding styles, and self-efficacy to their children with ARFID.

Introduction

The children with avoidant restrictive food intake disorder (ARFID) are at high risk of experiencing growth and development disorder [1, 2]. One of the symptoms is difficult to adapt to the new foods [3]. They tend to less consume the variant of foods. The condition impairs the lack of nutritional intake [4]. Lack of variety in food and children’s difficulties in adapting to new foods is caused by poor diet and malnutrition [5, 6]. Healthy dietary habit is greatly affected by family factor. In fact, a mother plays an important role in establishing healthy dietary habit to her children. If the mother has poor dietary habit, the children will have the same as well [7]. Mainly, the mother taking care of children with ARFID frequently feels desperate of her children condition. She becomes less confident in solving the problem because she does not have good plan and tends to be apathetic [8, 9]. Finally, the inability of a mother to introduce new foods, to demonstrate healthy food dietary, and to show self-efficacy will severely affect her children’s nutritional status.

The prevalence rate of children with eating disorder is reported 35% [10]. The parent reported that the children under pre-school age with eating new foods problem are between 15% and 50% [11]. Meanwhile, feeding style problem is reported 19.3%, authoritarian 14%, and rejection 35.3% [12]. The prevalence of eating disorders always increases every year in many countries, including in Indonesia [13]. In Malang City, East Java, Indonesia, there are 36.44% students with eating disorder [14]. The permissive and authoritarian feeding style and rejection in family may impair children’s poor dietary habit.

The education to improve a mother’s knowledge is deemed to be important because it may increase the children’s nutritional status. There is a little research discussing education program delivered to a mother related to children’s care with ARFID. The previous research stated that the education of nutrition-based effective community improves dietary habit and children’ growth [15]. Another research revealed that the education of nutrition-based effective community...
aimed to optimize children’s nutrition in 1000 1st day of birth improved a mother’s intention to actively provide nutritious food [16] and educational program of sensitivity-based effective family improved a mother’s perspective to take care of her children [17], [18]. Hence, this study focused on an educational program of nutrition to mothers which were expected to be capable in practicing healthy dietary habit, adapting to new foods to her children, and increasing their self-efficacy to take care of their children with ARFID. The purpose of this study was to analyze the effect of health education program given to a mother toward the improvement of her ability to adapt to new foods, healthy dietary habit, and her self-efficacy to take care of her children.

Methods

The design of the study

This study is a quasi-experimental design with two-group with pre-posttest to examine the effect of health education program given to a mother toward the improvement of her ability to adapt to new foods, healthy dietary habit, and her self-efficacy to take care of their children.

Setting and samples

The population involved in this study was all mothers who take care of their children with ARFID in Malang Regency – Indonesia. The number of samples with Z in the normal curve for significance level α used in the direct test hypothesis 0.05 was 1.64. Then, the value of Z with the normal curve used in the direct test hypothesis 0.2 was 1.285. The standard deviation of the population from other research 0.65 was 15 mothers in the experimental group. Thus, the total samples of 30 mothers consisted of 15 mothers in the experimental group and 15 mothers in the control group (Figure 1).

The inclusion criteria were mothers as a primary caregiver; having literacy skills; and having good physical and mental health. The mothers also had an experience in taking care of under 5 years old children with ARFID symptoms, and eating disorder which affects children’s sensory, such as poor perception on food presentation, food smell and taste, in addition children having no chronic disease and congenital disease. Furthermore, the exclusion criteria were mothers who were indirectly taking care of their children (helped by other caregivers).

Ethical considerations

This study was conducted according to Declaration of Helsinki guidance. The ethical approval was issued by the committee of ethics of Faculty of Public Health, Universitas Airlangga number 333-KEPK. All participants were asked to write down the informed consent form and sign it voluntarily after receiving information about the study and their right to participate or not in the study. The researcher convinced that their privacy and confidential information are highly secured.

Measurements

New foods adaptation

The questionnaire was used to measure the caregiver’s behavior in improving children’s social interaction skill and new foods familiarization. It consisted of 8 items ranging from 0 to 8. The indicators of the questionnaire were (1) social activity stimulus; (2) communication support; (3) new foods availability; (4) feeding practice of new foods; (5) children’s engagement in food selection; (6) eating together; (7) letting the children to eat independently; and (8) avoiding new foods at the same time. The Cronbach’s alpha value was 0.82.

Feeding style (practice)

This questionnaire aimed to evaluate the caregiver’s feeding practice toward the children by considering responsive and communication aspects. It
consisted of 7 items ranging from 0 to 7. The indicators of the questionnaire were (1) children’s motivation to share their own problem; (2) responsive feeding style; (3) developing children’s understanding; (4) compliment; (5) good reason; (6) sharing the feelings; and (7) encouraging the children to talk about every action that it has its consequences. The Cronbach’s alpha value was 0.84.

**The learning module program**

The design of this study was adjusted by the condition faced by mothers to take care of their children with ARFID. The module was created according to the process of the study at the first stage by identifying the determinant variable of mother’s competence. Furthermore, focused group discussion (FGD) was conducted to examine the desire, point of view, need, trust, and experience of mothers in taking care of their children with ARFID. FGD was performed 3 times by involving the mothers, medical staffs, and person in charge of nutritional program at health community center. The content validity of this module had been verified by a nursing professor (judging expert) in a nursing faculty. The specific structure and content of the learning module program are presented in Table 1.

**Data collection**

The data were collected in January 2019–March 2019 by means of a structured questionnaire (mothers and children’s characteristics, children’s adaptation to new foods, feeding style, and self-efficacy). All participants were given the information about the purposes and stages of this study and asked to fill informed consent form. The experimental group was distributed the learning module program and the technical intervention was performed four meetings in 4 weeks. Each meeting had an effective 50 min. The subject matters were about father’s involvement (the first meeting), managing eating disorder (the second meeting), promotional behavior (the third meeting), and self-efficacy enhancement (the fourth meeting) delivered by means of PowerPoint visualization and projector display. The control group is performed by home visit in which the group is given health education and learning module in two meetings. The first meeting concerned about health education by presenting the materials with PowerPoint visualization and projector display. Then, the second meeting concerned about the same material as the first one without PowerPoint visualization and projector display. Furthermore, both groups conducted pre- and post-test.

**Data analysis**

The data were analyzed using SPSS 22 software (IBM Incorporation, Chicago, IL, USA). The characteristics of mothers and children in the experimental and control groups were analyzed by distributing the frequency, percentage, mean, and standard deviation. The analysis of the characteristics and variables in this study was performed homogeneity test with some related methods, such as Chi-square test, Fisher’s exact test, t-test, and the Mann–Whitney U-test. Moreover, Shapiro–Wilks test was applied to verify the variable’s normality in a study. The non-normal distribution of variables was performed using the Mann–Whitney U-test. Meanwhile, the reliability of the instruments (children’s ability to adapt, feeding style, and self-efficacy) was analyzed using Cronbach’s α parameter. The significance level was considered at p < 0.05.

**Results**

**Homogeneity**

In general, there is no difference between characteristics and variables of the study in the two groups. However, there is a difference between education characteristics and income per month (Tables 2 and 3).
Table 3: Homogeneity test of the study variables (n = 30)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (n = 30)</th>
<th>Exp. (n = 15)</th>
<th>Con. (n = 15)</th>
<th>χ² or t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M ± SD</td>
<td>M ± SD</td>
<td>M ± SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children's adaptation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp.</td>
<td>5.80 ± 1.12</td>
<td>6.60 ± 0.49</td>
<td>4.3 ± 0.49</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Con.</td>
<td>5.61 ± 0.79</td>
<td>6.23 ± 0.49</td>
<td>5.0 ± 0.50</td>
<td>0.000</td>
<td>0.854</td>
</tr>
<tr>
<td>Feeding style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp.</td>
<td>3.30 ± 0.63</td>
<td>3.80 ± 0.32</td>
<td>2.80 ± 0.45</td>
<td>0.000</td>
<td>0.092</td>
</tr>
<tr>
<td>Con.</td>
<td>3.73 ± 0.458</td>
<td>3.87 ± 0.352</td>
<td>3.14 ± 0.227</td>
<td>-4.735</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 4: The adaptation to new food

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Difference</th>
<th>t or Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M ± SD</td>
<td>M ± SD</td>
<td>M ± SD</td>
<td>M ± SD</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>New foods adaptation</td>
<td>Exp.</td>
<td>6.13 ± 0.743</td>
<td>7.47 ± 0.516</td>
<td>1.34 ± 0.227</td>
<td>-4.735</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>4.57 ± 0.617</td>
<td>4.93 ± 0.594</td>
<td>0.36 ± 0.023</td>
<td>0.000</td>
<td>0.603</td>
</tr>
<tr>
<td>Feeding style</td>
<td>Exp.</td>
<td>6.00 ± 0.655</td>
<td>6.47 ± 0.516</td>
<td>0.47 ± 0.139</td>
<td>-4.646</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>4.73 ± 0.458</td>
<td>5.27 ± 0.799</td>
<td>0.54 ± 0.341</td>
<td>0.000</td>
<td>0.603</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Exp.</td>
<td>3.73 ± 0.458</td>
<td>3.87 ± 0.352</td>
<td>0.14 ± 0.106</td>
<td>-3.652</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>2.40 ± 0.632</td>
<td>3.20 ± 0.561</td>
<td>0.80 ± 0.071</td>
<td>0.000</td>
<td>0.603</td>
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</table>

Feeding styles

In this study, the ability of caregivers to take care of children with ARFID in adopting a better diet has also increased. This is indicated by behaviors such as encouraging children to convey their problems,

Discussion

This study aims to develop the learning program for mothers to take care of the children with ARFID. The learning module program explains about how to adapt to new foods, to implement healthy dietary habit, and to improve the mother’s self-efficacy.

New foods adaptation

This study discusses about the mother as a caregiver to take care of the children with ARFID and to assist them with new foods consumption. These efforts are indicated by encouraging the children to join social activities, presenting new foods, demonstrating of eating new foods in front of them, involving the children to select the food independently, eating together with family, letting them eat any kind of foods, and avoiding to offer new foods at the same time. Parental readiness in giving new foods based on their age is deemed to be important to prevent neophobia [19]. Presenting examples of new foods, involving children to choose foods, and letting new foods in children are very important for children to adapt to new foods. The children recognize the foods from their appearance, texture, and smell [20]. The frequency of children’s exposure to consume new foods is also related to the acceptance of children to new foods [21]. Two important things for parents to do in adapting their children to new foods are social and cognitive environmental factors. Social environmental factors include parental support, pressure during meals, and parental strategies. The cognitive factors affected children’s appetites are disgust, texture, appearance, and smell of food [22]. The parents must concern on food presentation because an interesting food display will stimulate children’s sensory and motivation to try it on [23]. Parental awareness to adapt their children plays an important factor to increase children’s control to respect themselves and others. This is in accordance with the previous study that increasing children’s adaptability means increasing children’s social skills. Increasing adaptability is a social development for children to play around which allows them to develop their empathy and interact more frequently. It can increase children’s awareness to share and be more able to respect themselves and others [24], [25]. In addition, the previous study also showed that new food adaptation will promoted healthy eating and living among refugees and help to reduce food help to reduce health disparities [26].
being responsive to children’s feelings and needs, giving compliment, and giving reasons to children why rules must be obeyed. Indeed, the parents will greatly determine children’ eating behavior. Children’s eating practice is highly determined by the healthy style or diet of the parents [27], [28], [29]. The pattern of proper feeding from infancy will lead to good eating behavior at a later age [11], [30]. Feeding style describes the interaction between parents and children related to the behavior and role of parents in controlling children to eat, such as how much the portion, when the child eats, limiting food, and using food as a gift. Feeding style can be formed from two dimensions, namely, needs and responsiveness. The dimension of the demand for food needs is related to the motivation of parents toward children to eat, while the responsiveness dimension is more about how parents pay attention to their children’s interest in food, making children eat because of sensory aspects of food, such as appearance, taste, and smell of food [31]. The previous study among Norwegian mothers showed that reported eating disorder was affected by feeding style [32].

**Self-efficacy**

The ability of caregivers to take care of the children with ARFID in increasing self-efficacy has also changed better. This is shown by the mother’s behavior in identifying her own weaknesses and strengths, increasing her ability to set goals, doing affirmations, and relax. Self-confidence in the ability of a mother to overcome ARFID problems in children is an important asset in solving ARFID cases in family. Strong self-efficacy will encourage mothers to take care of their children properly. Moreover, it will maintain mother’s motivation, realistic goals, and emotions. Self-efficacy is the belief to succeed in carrying out behaviors that lead to the desired results [33], [34]. Self-efficacy defines the personal confidence or ability to act. Furthermore, self-efficacy is a personal belief in his ability to carry out a special task or part of the various components of the task. High self-efficacy will achieve a better performance because the individual has strong motivation, clear goals, stable emotions, and the ability to perform a successful activity or behavior [35]. The previous study showed that self-efficacy decreased the eating behavior [36], [37], [38].

**Conclusion**

Based on the results of the study, it can be concluded that the learning module program on the mothers’ ability to take care of children with ARFID could improve the ability to adapt to new foods to children, adopt better eating patterns, and increase self-efficacy. The learning module program on the ability to take care of children with ARFID could be recommended as an intervention in the field of community nursing that focuses on improving nutrition on the children with ARFID.

**Acknowledgment**

We would like to acknowledge the Health Sciences Faculty, Muhammadiyah University of Malang, for the assistance in undertaking this research. We would also like to express our gratitude to the study participants, data collectors, and supervisors.

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