Title: Puberty Health Education and Female Students’ Self-efficacy

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Abstract

**Background:** Adolescence is an important period in every human’s life. Lack of knowledge on puberty issues may have a negative impact on an adolescent mental health and self-efficacy in the future. The aim of this study was to determine the effect of puberty health education on the general self-efficacy of the female students of Ghaemshahr public schools-Iran.

**Method:** It was a quasi-experimental study that was conducted on 100 female students of Ghaemshahr public schools with the onset of menstruation in 2018. To prevent data contamination, the control group was selected from another similar public school. Data were collected by Sherer General Self-efficacy Questionnaire and analyzed by SPSS-PC v. 19 using descriptive and inferential statistics including mean, standard deviation and Chi-square, Fisher exact test, one way ANOVA and paired t-test.

**Results:** The groups were matched for demographic variables except mother's age (P = 0.01) and father's education (P = 0.001). Self-efficacy was not low in none of the groups before and after the training. Mean pre-training self-efficacy scores in the intervention (63.68± 9.72) and control (65.3 ± 8.78) groups were not statistically significant (p = 0.69). Comparison of the students’ self-efficacy mean score before and after intervention revealed that there was a significant difference in the intervention group (P=0.017), but there was not a significant change in the control group (P=0.284). Comparison between groups mean self-efficacy changes before and after intervention showed no significant difference (P= 0.294).

**Conclusion:** Puberty health education was effective in promoting the female students' self-efficacy. Accordingly it is recommended to include puberty education in female students' courses. In addition, community health nurses need to include these trainings in their program.

**Keywords:** Health education, Puberty, Self-efficacy, Girls, Students
Highlights

- Adolescence is one of the most critical stages of a person's life.
- Widespread psychological problems such as depression, antisocial behaviors, and academic failure may arise due to dynamic changes regarding puberty.
- In Iran, according to the census report of 2016, more than 25% of the population consisted of adolescents aged 10 to 19, half of them were female.
- Most girls do not have the basic and essential information about mental and physical condition in puberty as well as appropriate health behaviors needed.
- Adolescent girls need accurate and adequate information about their bodies and their health.
- Education must be conducted in order to disseminate knowledge about the physical, psychological and social questions based on family, school, and public education.

Plain Language Summary

People with high self-efficacy compare to those with low self-efficacy, select more challenging tasks which involve more effort, larger goals and greater resilience; thus show better performance and experience less anxiety. Adolescent health education as a form of educational investment, includes care that promotes mental, physical, and emotional health in adolescence and other life stages. The aim of this study was to determine the effect of puberty health education on the general self-efficacy of public school female students. The findings showed that puberty health education was effective in promoting the students' self-efficacy. This result can be used by health care providers, especially community health nurses, to provide appropriate and practical training in promoting students' self-efficacy.
1. Introduction

Adolescence is an important period in every human’s life. It is one of the most critical stages of a person's life, linking childhood to adulthood, which involves extensive physical, psychological and social changes (Martin and Steinbeck, 2017). Widespread psychological problems such as depression, antisocial behaviors, and academic failure may arise due to the dynamic changes of puberty in brain and body glands (Heydari et al., 2015). Adolescence is one of the most critical periods of life in which awareness of its natural process and problems can lead to a successful transition to adulthood and fertility (Mohsenizadeh et al., 2017). In Iran, according to the census report of 2016, more than 25% of the population consisted of adolescents aged 10 to 19, half of them were female (IranStatisticsCenter, 2017). Most girls, do not have the basic and essential information about mental and physical changes of puberty and appropriate health behaviors needed to manage these problems. This is probably relates to the fact that some parents do not properly transfer related knowledge to their daughters due to lack of knowledge and also low levels of parental education and lack of proper and close relationships between parents and adolescents (Afghari et al., 2008). This, in fact, leads to improper education, misinformation, shame and avoiding social discussions about genital health and impeding young girls’ access to social and mental health which in turn makes them to feelings of not being positive about themselves and their abilities, that leads to many other problems (Todd et al., 2015). In many African countries, the level of knowledge and awareness of girls about adolescence and puberty matters have been reported as insufficient. Also in our country, most girls lack basic and essential information about adolescence probably for cultural reasons (Ghahremani et al., 2008). With the onset of puberty symptoms and lack of awareness about these changes, girls would be confused and confront with many problems (Mokarie et al., 2013). The concept of self-efficacy that was first defined by Albert Bandura in 1977 is considered as an important prerequisite for behavioral changes (Morowati Shirafabad and Rouhani Tonkaboni, 2008). In Bandura's theory, self-efficacy refers to a sense of worth, competence, and ability to cope with life. He views self-efficacy as one of the cognitive processes through which we develop many of our social behaviors and personal traits. On the one hand, high self-efficacy enhances the success and quality of human life (Bandura, 1994). In contrast, low self-efficacy weakens intention, and impairs performance; while, high self-efficacy beliefs facilitate participation in a task, task choice, effort, and performance. Thereby, self-efficacy beliefs, create foundations for one's motivation, happiness, and success (Mirzaei-Alavijeh et al., 2018). Adolescents are considered as the driving force behind society; therefore, excessive care should be given to their mental health more than before (Heydari et al., 2015). People with high self-efficacy compare to those with low self-efficacy, select more challenging tasks which involve more effort, larger goals and greater resilience; thus they show better performance and experience less anxiety; in general, they show better mental health (Behrangi et al., 2017). Self-efficacy strategies have been strongly recommended to people (Mitchell et al., 2010), and one of the factors that play an important role in the development of self-efficacy is education (Morowati Shirafabad and Rouhani Tonkaboni, 2008; Reisi et al., 2017). The more people in the community are aware of diseases, the more they will strive to fight it, and this awareness is not possible except by education (Yahyavi and Pourrahimi, 2012). Complications and problems of puberty are easily preventable. Health education is one of the fundamental and successful approaches to health promotion that works in different ways to improve awareness, shape beliefs, and lead to healthy behaviors and lifestyles (Heydari et al., 2015). Adolescent girls need accurate and adequate information about their bodies and their health. Therefore, education must be conducted in order to disseminate knowledge about the physical, psychological and social questions of adolescence based on family, school, and public education (Valizadeh et al., 2017). Learning after educational sessions, leads to behavioral changes; because after acquiring new skills or information, the learner's attitude towards events will be changed compare to their pre-learning conditions, and thus self-efficacy will be increased through verbal encouragement during training (Yahyavi and Pourrahimi, 2012). Therefore, self-efficacy structure can be used as a theoretical basis in many educational health programs by health care professionals, especially community health nurses, to provide and promote healthy behaviors (Heydari et al., 2015). Adolescence health education as a form of educational investment, includes care that promotes mental, physical, and emotional health. This education can be done at three levels: in family, school and public education with the aim of making positive behavioral changes, raising awareness and helping people achieve health (Ghahremani et al., 2008). It has been shown that educational intervention is effective in promoting
puberty health self-efficacy (Heydari et al., 2015). Menstrual health studies among Iranian adolescent girls are limited. Puberty and its impact on the future of girls are of great importance; hence through their education, information about puberty health will be released to the society. Accordingly, the aim of this study was to determine the effect of puberty health education on the self-efficacy of female students in Ghaemshahr public schools.

2. Materials and Methods

This is a quasi-experimental study with control group. The study population consisted of all 13-14-year-old female students of Ghaemshahr public schools. Inclusion criteria were 13-14-year-old female students in Ghaemshahr public schools who have had one year of menstruation. Exclusion criteria were either not attending a training session or unwilling to continue the study. After obtaining permission from the Ethics Committee of Iran University of Medical Sciences (IUMS) and Mazandaran University of Medical Sciences and also Ghaemshahr Department of Education, a two-staged stratified random sampling method was used. In stage one, two schools were randomly selected from the list of Ghaemshahr public primary schools among the seventh and eighth grades; (sixth, seventh and eighth grades) (one school for the intervention group, another one for the control group). In this way, two separate schools were chosen, to prevent contact between research units in each group and data contamination. Then the researcher personally visited the schools and sorted the intervention and control groups randomly from the list of students in each grade (seventh and eighth grade) by drawing the number required for the sample study. According to initial studies the standard deviation of self-efficacy score was about 8.5 (10% of the total score). Therefore, a sample size of 50 considering 5 subjects for attrition and 95% confidence and test strength of 80% was calculated.

At first the educational content was provided to 10 students and its related problems were solved by the students, in terms of comprehension and understanding. After obtaining written informed consent from the eligible participants, the objectives and expected activities of the study were explained and then the subjects completed the demographic form and the research questionnaire (Sherer General Self-efficacy Scale Questionnaire). The demographic data form included age, educational background, parents’ education and occupation, parenting status, puberty awareness, most important source of information on puberty, and individual preference for information source. General Self-efficacy Scale Questionnaire is constructed by Sherer and colleagues in 1982. It includes 17 questions in areas such as not surrendering to problems, ability to deal with problems, ability to achieve goals, and sustainability for performing activities. Each question is scored on a Likert type scale from strongly disagree (1) to strongly agree (5). Questions 8, 3, 1, 9, 13, 15 are scored from right to left, and the rest are scored reversely from left to right. Score below 25% (17 to 33.9) is considered as low self-efficacy, between 25% to 75% (34 to 69.7) as moderate and above 75% (score 68 to 85) as high self-efficacy. Therefore, the maximum score a person can get from this scale is 85 and the minimum score is 17 (Delavar and Najafi, 2013). Cronbach’s alpha coefficient of the general self-efficacy was reported as 0.86 by Sherer et al. In Iran, Niakroei (2004) calculated the Cronbach’s alpha of the Persian version of the questionnaire as 0.78. Asgharnejad and colleagues in their study on Iranian subjects evaluated its psychosocial properties and reported the Cronbach’s alpha as 0.83. The external validity of the instrument was confirmed by test-retest method. The questionnaire was completed by 10 students with the same characteristics as the research subjects from one of the Ghaemshahr’s schools within two weeks. These students were not included in the study. In order to prevent data contamination, the study was first performed on control group. After completing informed consent, the subjects completed the questionnaire. The control group completed the questionnaires again, three months after the intervention period. This process was then repeated for the intervention group. The intervention group training was conducted in four consecutive sessions each about 30 minutes. The lectures were given by the researcher according to the instructional pamphlets that have already been validated by the nursing faculty members, using teaching aids such as markers, boards and slides. The content of the first session included, introduction to puberty and its associated concepts; the second session was about physical changes and physical health of puberty (nutrition, exercise and physical activity, sleep and rest, personal health, menstrual health); the third session included, mental changes of puberty, mental health and self-efficacy. Finally, in the fourth session, monthly religious
rituals related to menstruating and what they learned so far was reviewed in the form of question-and-answer. The subjects were allowed to ask questions about their ambiguities, at the end of each session. After 12 weeks, the researcher returned to the schools with the post-test questionnaires (Sherer General Self-efficacy Questionnaire) which were completed by the same group of students in the intervention and control groups. At the end of the intervention, educational content was given to the student in control group. SPSS software version 19 was used for statistical analysis. Descriptive and inferential statistics were used for data analysis. Chi-square and Fisher exact tests were used to compare the demographic characteristics of the groups. One-way ANOVA was used to analyze the data related to general self-efficacy, before and after the intervention. Paired t-test was used to determine the difference between general self-efficacy before and after educational intervention in each group. Significance level was considered 0.05 in this study.

3. Results

Table 1: Frequency distribution of female student’s demographic characteristics

<table>
<thead>
<tr>
<th>Students’ characteristics</th>
<th>Groups</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
</tr>
<tr>
<td>Age</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>29</td>
<td>63</td>
</tr>
<tr>
<td>14</td>
<td>21</td>
<td>38.9</td>
</tr>
<tr>
<td>Mother’s job</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housekeeper</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

Chi-square test

\[ X^2 = 5.79 \]

Df = 1

P = 0.016

There was no significant difference between the mean self-efficacy score of the intervention (63.68 ± 9.72) and control (65.3 ± 8.78) groups before training (P = 0.694). The difference between the mean score of self-efficacy before and after training was not significant in the control group (67.12 ± 9.16) (P = 0.284). However, in the intervention group, it was significant (68.62 ± 8.81) (P=0.017), (Table 2).

There was no statistically significant difference between the mean changes in self-efficacy scores of the groups before and after the training (P = 0.294).
<table>
<thead>
<tr>
<th></th>
<th>With parents</th>
<th>Only father, or mother, stepmother or stepfather</th>
<th>Fisher's exact test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living with parents</td>
<td>50 100 48 96</td>
<td>0 0 2 4</td>
<td>P = 0.495</td>
</tr>
<tr>
<td>Having older sister</td>
<td>40 80 40 80</td>
<td>10 20 10 20</td>
<td>P = 0.226</td>
</tr>
<tr>
<td>The most important source of information about puberty</td>
<td>28 56 33 66</td>
<td>6 12 6 12</td>
<td>P = 0.118</td>
</tr>
<tr>
<td></td>
<td>0 0 3 6</td>
<td>16 32 8 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22 44 24 48</td>
<td>11 22 11 22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17 34 15 30</td>
<td>16 32 8 16</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Comparing the mean general self-efficacy scores of the students before and after the training
<table>
<thead>
<tr>
<th>General Self- efficacy Group</th>
<th>Mean &amp; SD</th>
<th>Before intervention</th>
<th>After intervention</th>
<th>Result of test Paired- samples t Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Mean</td>
<td>63.68</td>
<td>68.62</td>
<td>t = 2.47 Df = 49 P = 0.017</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>9.72</td>
<td>8.81</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Mean</td>
<td>65.3</td>
<td>67.12</td>
<td>t = 1.084 Df = 49 P = 0.284</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>8.78</td>
<td>9.16</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Comparison of general self-efficacy changes in intervention and control groups before and after training

<table>
<thead>
<tr>
<th>General Self-efficacy Group</th>
<th>Mean &amp; SD Before intervention</th>
<th>Mean &amp; SD After intervention</th>
<th>Variable Mean &amp; SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>9.72 ± 63.68</td>
<td>8.81 ± 68.62</td>
<td>-4.94 ± 14.12</td>
</tr>
<tr>
<td>Control</td>
<td>8.87 ± 65.3</td>
<td>9.16 ± 67.12</td>
<td>-1.82 ± 11.87</td>
</tr>
<tr>
<td>ANOVA test result</td>
<td>F = 0.366</td>
<td>F = 1.83</td>
<td>F = 1.23</td>
</tr>
<tr>
<td></td>
<td>P = 0.694</td>
<td>P = 0.163</td>
<td>P = 0.294</td>
</tr>
</tbody>
</table>

4. Discussion

The study was conducted with the aim of investigating the effect of puberty health education on the self-efficacy of 13-14 years old female students in Ghaemshahr public schools. Based on the results, the mean score of self-efficacy has been increased significantly in the intervention group which signified the positive impact of training on the self-efficacy of this group. However, in the control group, the mean difference was not statistically significant. Although no research was found to address this issue directly, the related studies have shown the effectiveness of educational programs on enhancing students’ self-efficacy. The results of a study in India showed that presenting an intervention approach to girls’ health education in the field of menstrual health management caused a significant change in their knowledge and performance (Dongre et al., 2007). It has been also found that education improves nutritional performance...
in the trained adolescent students (Schmidt, 2010). Similar studies have also highlighted the impact of puberty health education on raising girls’ awareness and performance (Majlessi et al., 2012, Hassanzadeh and Lashkardoust 2013, Kalantary et al., 2013, Alimoradi and Simbar, 2014, Naisi et al., 2016). But a study about the effect of puberty health education on mothers and their daughters on students’ knowledge and performance, showed that girls’ direct education only increased their puberty health score, but it could not affect their performance. Accordingly, in order to promote adolescent girls’ awareness of puberty health, education to mothers could be a more effective method than training adolescent girls directly (Afsari et al., 2017). It has been shown that educating adolescents on nutritional performance and physical activities like exercise has a positive effect on their self-efficacy (Yahyavi and Pourrahimi, 2012). The results of a study showed that educational interventions made positive significant changes in the health behavior of female adolescent students (Abedi et al., 2015). Health education through lectures and educational packages in a study was effective on advancing the self-efficacy of 11-9 years old students during puberty (Heydari et al., 2015). A study aimed at investigating the impact of an educational program on the health promotion of adolescent girls’ physical health showed that educational intervention had a positive effect on improving students’ performance during adolescence (Shirzadi et al., 2015). A study on the effectiveness of group education on girls’ self-efficacy indicated that spiritual education plays an important role in enhancing students’ mental health. The authors concluded that promoting self-efficacy is one of the key steps in achieving optimal mental health (Safa Chaleshtari et al., 2017). According to the findings of a study, self-efficacy has a strong effect on the health behaviors, because high self-efficacy increases ability, capability, competence, and adequacy. The authors have emphasized that self-efficacy is the foundation of a behavior that should be given special attention; because, it is needed not only to know what should be done and to know the causes of that behavior, but also it is needed to enable the person to perform that particular behavior (Ramezankhani et al., 2011). It has been shown that educational intervention also had a positive and significant effect on the perceived self-efficacy and interpersonal relations, as well as reducing existing barriers to physical activity and performance improvement (Teymouri et al., 2007). This indicates the importance of self-efficacy in performing health behaviors.

5. Conclusion

According to the results of the study, there was no significant difference in the self-efficacy between the intervention and control groups, which may be associated with the three months’ time interval between training and post-tests; although self-efficacy significantly increased in the intervention group after the study. The results of other mentioned researches also revealed that puberty health education plays an important role in increasing students’ self-efficacy and it can lead to positive health behaviors in adolescents (Yahyavi and Pourrahimi, 2012). Since health habits and patterns are formed in childhood and adolescence, and proper health behaviors in these ages affect health and well-being in the years to come; and in the meantime the school environment plays an important role in conveying healthy or unhealthy habits, the necessity of providing educational programs to change the habits of health practices is emphasized more than ever. Therefore, health care providers, including community health nurses can provide puberty health promotion training programs to increase self-efficacy of these groups of girls. In order to lead a healthy and vibrant life, health education programs should be included in school health programs and self-efficacy enhancement must be planned from an early age. Students are the best messengers of health; they can help their parents to live their lives in a way that enhances their sense of responsibility for their own health and that of their children, and to strive to lead their inappropriate health behaviors towards healthy ones. It is suggested that future studies extend training time and education be conducted by a qualified person, preferably a community health nurse, in a form of a major course.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of IUMS (code: IR.IUMS.FMD.REC.1397.342). The current study was registered at the Iranian Registry of Clinical Trials (IRCT) (Registration Code Number IRCT20180714040461N1). All the students signed the informed consent.
Authors' contributions

Conceptualization: Soghra Nikpoure, Marhamat Farahaninia, Simin Khatirpasha; Methodology, Soghra Nikpoure, Marhamat Farahaninia, Simin Khatirpasha, Hamid Haghani; Investigation: Simin Khatirpasha; Writing-original draft: Marhamat Farahaninia, Simin Khatirpasha, writing review and editing Marhamat Farahaninia; Simin Khatirpasha, and Supervision: Marhamat Farahaninia.

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Conflict of interest

The authors declared no conflict of interest.

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