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A Comparison Between the Skills-Based Education with a Lecture-Based Education on Female Adolescents' Knowledge, Attitude and Practice about Health in Puberty: A Randomized Trail Study

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Abstract

Introduction: Skills-based health education is useful in the promotion of health behaviors. Preparing for puberty is essential for adolescents. This study aimed to assess the effects of a skills-based education on girls' knowledge, attitudes, and practice about health in puberty.

Methods: This was an experimental study on 80 female school students in Tehran, Iran. Two groups of forty participants were randomly designated as the experimental and control in two different high schools in Tehran. A skills-based education program trained the experimental group, and a routine lecture-based education taught the control group about health in puberty. Data was collected using a questionnaire that assessed the participants' knowledge, attitudes, and practice about health in puberty; before, immediately after, and two months after the education.

Results: Knowledge and attitude were significantly improved in the skills-based education group comparing to the Lecture-based group, immediately after ($P = 0.002$ and $P = 0.045$, respectively) and two months after the interventions ($P < 0.001$ and $P = 0.034$, respectively). Both methods were not effective in improving practice.

Conclusions: Skills-based health education is more effective than the routine lecture-based education on improving knowledge and attitudes about puberty in health.

INTRODUCTION

Adolescence is a link between childhood and adulthood, characterized by significant physical, psychological, and social transitions, and puberty is a critical stage of human development. Adolescents' awareness about physiological changes of puberty leads to a safe transition of adolescence towards adulthood [1] adolescence [2, 3]. Studies in Iran indicated a low level of knowledge and incorrect practices of adolescents' health in puberty [4-6]. Studies also showed that adolescents' education about pubertal

changes and reproductive health prevents misconceptions spread by unqualified sources, high-risk behaviors, and diseases in adulthood [7-9].

Adolescents' education in schools needs effective and attractive methods of teaching [10]. Participatory methods of teaching are preferred to the structural methods in adolescents' education. Because, in the participatory methods (such as role-playing, small group discussion, problem-solving, and game-playing), the learners are actively involved in the process of learning while in the structured methods such as lecture, only the teacher is active, and the learners are passive in the process of learning. Therefore, participatory methods improve knowledge, attitude, and skills more than structural methods' of teaching [11].

SBHE(SBHE) is an approach to creating or maintaining healthy lifestyles and conditions through the development of knowledge, attitudes, and especially skills, using various learning experiences, with an emphasis on participatory methods [12]. SBHE is recommended by WHO because it uses participatory methods of teaching. Therefore it is based on the theories of behavior change, and so it is more successful for improving health behavior and skills [13]. Skills for Health focuses on school-based programs [14].

Skills-based school health education means life skills for Health focuses on school-based programs [12]. Life-skills are defined as psychosocial abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life.[15] UNICEF defines life-skills as a behavior development approach designed to address a balance of three areas: knowledge, attitude, and skills [16, 17]. Life-skills are necessary for all dimensions of human life, and therefore its education is essential for the development of healthy life [18].

Although health-promoting schools are educating life skills in Iran, and health education with necessary topics are providing to the school students but, the majority of schools are not using participatory methods for teaching life skills on health topics. Instead, they are mostly using the lecture method and providing booklets [19, 20]. While SBHE emphasizes the education of life skills on health topics using participatory methods of teaching to improve related life skills. SBHE should be planned and taught by trained teachers and planners [12]. Iran, like many developing countries, suffered from limitations of the trained health educators [19]. Therefore, planning, evaluating, and introducing skills-based school health education programs are essential for adolescents' health education and promotion. In an Iranian review article on adolescents' reproductive health educational needs assessment, which was performed on published articles between 2000-2015, 37 articles were appraised, and the results showed 5 researches examined different methods of teaching about puberty health. Two studies examined the effects of the lecture method. Two studies assessed the effects of peer education, and only one study evaluated the effects of game and role-playing methods on adolescents' KAP about puberty health [21]. A study showed that 84% of adolescents considered that access to puberty and reproductive health data is necessary; however, only 48.3% of them had access to this information [22].

There are several studies on evaluating of skills-based school health education programs and comparing them with usual lecture-based educational programs. There are several international studies to assess the effects of skills-based health education for preventing high-risk behaviors such as drug abuse, alcohol consumption, violence among youth [23-25]. In Iran, few studies assessed the effects of life-skills education on coping with stress, drug abuse prevention, public health, anger control, promotion of physical activity, and preventing depression among college and high school students [26-30]. Some studies showed higher effectiveness of participatory education than the usual lecture-based education about health in puberty [31, 32]. Other studies demonstrated that skills-based participatory health education virtually affects adolescents' sexual and reproductive self-care behavior [9, 33, 34].

It is demonstrated that female adolescents face many risk factors [35], mainly because of xc the menstrual period and bleeding and so female gender stereotype. They need to be educated about health, especially about sexual reproductive health in Iran [2]. Besides, menstrual health education during puberty is emphasized during the recent few years [36]. Therefore, the planning and evaluation of a skills-based school health education program for female adolescents seems necessary. Therefore, the present study aims to assess the effects of a skill-based education on knowledge, attitude, and practice of female adolescents about health in puberty for the first time in Iran.

METHODS

Study Population

This study was an experimental study on 80 female high school students in Tehran. Two groups of forty participants were randomly designated as the skills-based education group and lecture-based education group in two different high schools in Tehran.

The sample size was calculated using power 80 percent and α = 5 percent. The sampling was performed using a randomized sampling method by "Excel randomizing option" for selecting one) the region of Tehran and, 2) the two public high schools and, 3) the students as the Subjects of the study.

The inclusion criteria for selecting the subjects were: age 12-14 years old, being high school student (Grade 7 to 9 the first period of high school), and willingness for participation.

After giving a detailed explanation about the aims and procedure of the study, the written informed consents were signed by the students and their parents as well as the schools principals.

Tools for Data Collection

Data were collected using two questionnaires, including a demographic questionnaire and a questionnaire with 19 questions about knowledge, attitude, and practice (KAP) about health in puberty. This KAP questionnaire was researcher-made.

The development of a novel KAP questionnaire was seemed to be necessary. Puberty in adolescents needs special care and educational interventions. These interventions should be planned based on the unique characteristics of female adolescents' puberty. Especially, in the recent few years, WHO [37] and UNICEF [36] emphasize the importance of menstrual health and hygiene. Therefore, it seems a questionnaire is necessary to be developed based on not only the unique health and nutritional needs of females' puberty but also the needs of menstrual health. Also, regarding some misconceptions about bathing and washing vulva during menstruation among Iranian girls, developing a novel, valid and reliable questionnaire was seemed to be necessary.

A deductive approach for questionnaire development developed the KAP questionnaire. There are three approaches for questionnaire development, including inductive, deductive, and inductive-deductive approaches. The deductive approach was used to develop the questionnaire.[38] The deductive approach was selected because there is adequate literature to extract items for the questionnaire. In this accordance, it was developed by a detailed review of the literature, including related papers, questionnaires, and textbooks, mainly Textbook of Adolescent Health Care [39] and the UNICEF guideline [36].

This was a Knowledge, Attitudes and Practices (KAP) questionnaire with 19 questions, about girls' knowledge (5 items about: using sanitary pads during menstruation, bathing during menstruation, washing vulva during menstruation, premenstrual symptoms (PMS), and physiological changes due to hormonal changes during menstrual cycle), attitudes (5 items about: adopting PMS as a physiologic change, using cotton hygienic underwear, bathing during menstruation, adopting menstruation as a non-pathologic occurrence, washing vulva during menstruation) and practice (9 items about: seeking information about self-care during menstruation, providing information to peers about health care during menstruation, participating in the educational programs about health during puberty, talking with mother about PMS, solving problems related to menstrual cycle, seeking information about care during menstrual cycle, correct using of sanitary pads, washing vulva during menstruation, and seeking information about puberty health in media).

In determining the content validity of the questionnaire, the necessity of each item was addressed from the experts' points of view. The content validity ratio was, therefore, assessed by 16 experts and scored based on a 3-point Likert scale. According to Lawshe's table, content validity ratio scores higher than 0.42 for 16 individuals indicate the necessity of the item at a statistically significant level (P = 0.05) [40]. These items entered the next stage of the content validity index measurement. The views of 16 faculty members and experts in reproductive health, health education, public health, and psychiatry were assessed to determine the relevance, clarity, and simplicity of each item with a 4-point Likert scale, based on Waltz & Bausell's content validity index [41]. The scores obtained for all the items were assessed against this index, and the item was accepted if the index value was 0.79 or higher [42]. Then, the calculations showed content validity index 0.92 and content validity ratio 0.86.

The reliability of the questionnaire was also assessed using stability measurement. The reliability of the questionnaire was also assessed using stability measurement. For evaluating stability through the test-retest method, the correlation of scores of the two tests with a 2-week interval was computed for 15 female adolescents who were selected using a convenience sampling method. The stability of a tool is confirmed when the correlation is higher than 0.7 [43]. The reliability of the questionnaire was confirmed by r = 0.80.

Scoring Procedure: The final questionnaire consisted of 19 questions in 3 domains of Knowledge, Attitudes, and Practice (KAP). The knowledge questions (5 items) were scored 0 for incorrect and 1 for correct responses (Range from 0 to 5). The attitude questions (5 items) were scored by a 5-point Likert scale from 0 to 4 for completely agree to disagree (Range from 0 to 20). The practice questions (9 items) were scored on a 5-point Likert scale, from 0 to 4, for never, to always responses (Range from 0 to 36). The scores of each domain were summed up and calculated in percent. Four items out of 19 items of the questionnaire with incorrect or negative content (For example: "Bathing is harmful during the period" were reversely scored. The following conversion formula was used to convert the raw scores to percent (0 to 100):

Score in percent = Score-Minimum × 100/Maximum-Minimum

The demographic questionnaires were completed before the intervention, and the KAP questionnaires were completed three times: before, immediately after, and two months after intervention.

The Intervention

The sampling was performed using a randomized sampling method by an "Excel randomizing option" for selecting the students in selected schools.

All participants completed the demographic and KAP questionnaire before the intervention. Then they were devoted to two interventional groups of 1) skills-based education and 2) lecture-based educational interventions.

Skills-based health education group: Students in the SBHE group were educated about physiological changes due to hormonal changes during the menstrual cycle; PMS and adopting PMS as a physiologic change; hygienic care during menstruation such as using sanitary pads, bathing during menstruation, washing vulva during menstruation, using clean cotton underwear; seeking information about self-care during menstruation; providing information to peers about health and self-care during menstruation, participating in the educational programs about health during puberty, solving problems related to PMS, Menstruation and menstrual cycle and dysmenorrhea; and seeking correct information about health in puberty through media (Table 1). They were educated in one session for 2 hours by the researchers who were experts in reproductive health education. They were taught about the content mentioned above through participatory methods of teaching, such as group discussion, brainstorming, questioning, role-playing, problem-based teaching methods. Through these participatory methods of teaching, they also practiced life skills such as negotiation skills and saying no to unsafe suggestions in role-playing; and showing communication and interpersonal skills in the group discussions; and critical and creative thinking and problem-solving in problem-based teaching to solve the health-related problems, and to suggest the strategies to solve the problems (Table 1).

Table 1. The Lesson Plans of Skills-Based Health Education Group and the Lecture-Based Educational Groups

The Lesson Plan for Skilled Based Health Education Group						
Behavioral Objective At the End of the Class, the Student Should be Able to:	**Domain**	**Teaching Method**	**Educational media**	**Life Skill**	**Duration**	**Assessment Method**
Explain the importance and benefits of self-care during menstruation	Affective	Questioning	White Board	Communication Skills, critical thinking	10	Oral
Discuss the possible consequences of not performing hygiene during menstruation	Cognitive	Group Discussion	Whiteboard	Interpersonal Skills, Critical thinking	10	Oral
Analyze the misconceptions about bathing and washing vulva during menstruation	Affective	Role-Playing, Group Discussion	Whiteboard	Negotiation Skills, interpersonal skills, Critical thinking	15	Oral
Seeking and suggesting correct information sources for health problems in puberty	Psychomotor	Case report, Problem based	Internet search by computer or Mobile	Critical thinking, Creative thinking	15	Oral
Describe the physiologic changes during the menstrual cycle	Cognitive	Demonstration	Video Project	Communication and interpersonal Skills	15	Oral
Suggest a self-care plan for a case of PMS	Psychomotor	Problem-based	Whiteboard	Creative thinking and problem Solving	20	Oral
Provide suggestions to promote self-care in school	Psychomotor	Brain Storming, Group Discussion	Whiteboard	Creative thinking, problem-solving	20	Oral
Discuss the benefits of healthy eating and physical activity during puberty	Cognitive	Group Discussion	Whiteboard	Critical thinking, Creative thinking	15	Oral
The Lesson Plan for the Lecture-Based Education Group						
Explain the importance and benefits of self-care during menstruation	Affective	Lecture	Video Project		15	Oral
Explain about the possible consequences of not performing hygiene during menstruation	Cognitive	Lecture	Video Project		15	Oral
Explain about misconceptions about bathing and washing vulva during menstruation	Cognitive	Lecture	Video Project		15	Oral
Recall information sources for health puberty	Cognitive	Lecture	Video Project		15	Oral
Describe the physiologic changes during the menstrual cycle	Cognitive	Lecture	Video Project		15	Oral
Describe the self-care plan for PMS	Cognitive	Lecture	Video Project		15	Oral
Explain the strategies to promote self-care in school	Cognitive	Lecture	Video Project		15	Oral
Explain the benefits of healthy eating and physical activity during puberty	Cognitive	Lecture	Video Project		15	Oral

The lecture-based education group: Forty randomly selected female students of the other selected high school were also considered as the control group. They were taught using a lecture method on the same content of the skills-based education group, including physiological changes due to hormonal changes during the menstrual cycle; PMS and adopting PMS as a physiologic change; hygienic care during menstruation such as using sanitary pads, bathing during menstruation, washing vulva during menstruation, using clean cotton underwear; seeking information about self-care during menstruation; providing information to peers about health and self-care during menstruation, participating in the educational programs about health during puberty, solving problems related to PMS, Menstruation menstrual cycle and dysmenorrhea;

Appropriate sources of information about health in puberty through media. They were also educated in one session for 2 hours. Then a booklet was provided with the content mentioned above (Table 1).

The procedure of the study is demonstrated in Figure 1.

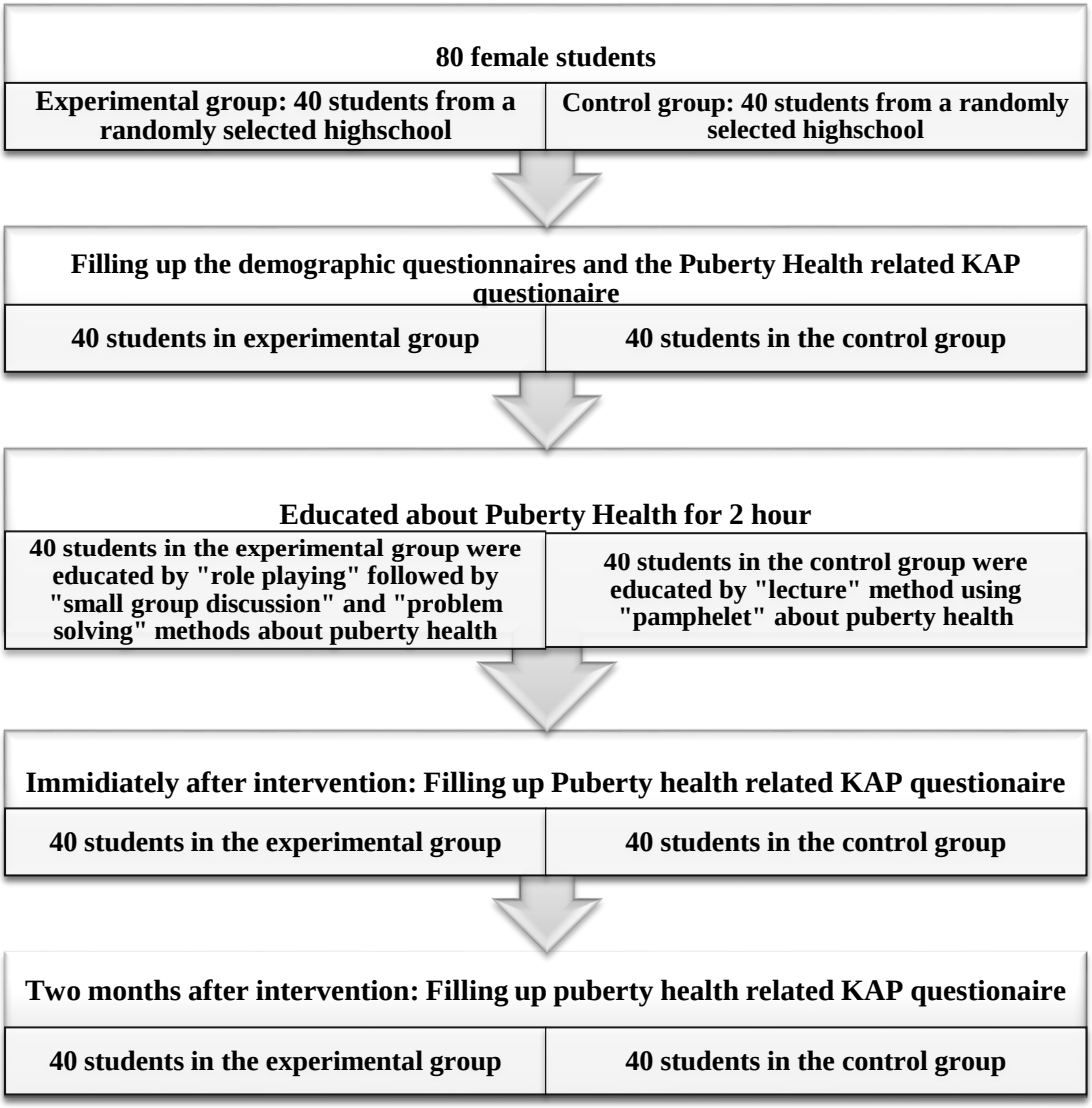

Figure 1. The Consort Flow Chart and Procedure of the Study of "the Effects of Skills-Based Health Education of Female Adolescents About Puberty Health"

Statistical Analyses

Data were analyzed by SPSS 21.0 and by using *t*-test, Mann-Whitney U test, Chi-Square, Repeated Measure, and ANOVA. T-test was used to compare the scores of knowledge, attitude, and practice of two groups of experimental and control when the score is normally distributed. Mann-Whitney U test was used to compare the scores of knowledge, attitude, and practice of two groups of experimental and control when the scores were not normally distributed.

The Chi-Square was used to compare categorical variables related to two groups. The repeated measures ANOVA (RM ANOVA) compares means scores of repeated observations immediately and after the intervention.

RESULTS

All 80 participants completed the procedure of the study and therefore data were analyzed for all participants. The comparison of demographic characteristics including; student's age, the parents' age and the parents' education of the students in two experimental (skills-based education) and control (lecture-based education) showed no significant difference before intervention (Table 2).

The comparison between two groups of "Skills-based education" with "Lecture-based education" demonstrated knowledge were significantly higher in the SBHE group in comparison with the control group, in both phases of follow up including immediately after

(P = 0.002) and 2 months after the education (P < 0.001) (Table 3). Attitude scores were also significantly higher in the SBHE group compared with the control group immediately after (P = 0.045) as well as two months after the education (P = 0.034). However, the practice was not significantly different between the two groups for both phases of follow-up (P > 0.05) (Table 3).

Table 2. The Comparison of Demographic Characteristics of the Students in Two Experimental (Skills-Based Education) and Control (Lecture-Based Education)

Groups Characteristics	Skills-Based* n = 40	Lecture-Based n = 40	Test
	Mean ±SD or n (%)	Mean ±SD or n (%)	
Students' age (year)	13.68 ± 0.474	13.63 ± 0.490	t-test; P=0.644
Mothers' age (year)	40.68 ± 4.845	40.43 ± 5.139	t-test; P=0.824
Fathers' age (year)	47.03 ± 4.828	46.13 ± 4.286	t-test; P=0.381
Mothers' education			Mann-Whitney P = 0.521
Under diploma	2 (5)	2 (2.5)	
Diploma	22 (55)	19 (47.5)	
Bachelor	13 (32.5)	15 (37.5)	
Master	3 (7.5)	4 (10)	
Fathers' education			Mann-Whitney P = 0.627
Under diploma	1 (2.5)	2 (5)	
Diploma	11 (27.5)	13 (32.5)	
Bachelor	17 (42.5)	14 (35)	
Master	9 (22.5)	9 (22.5)	
Doctorate	2 (5)	2 (5)	
Mothers occupation			Chi-square P = 0.343
Employed	10 (25)	11 (27.5)	
Housewife	30 (75)	26 (65)	
Other	0 (0)	3 (7.5)	
Fathers' occupation			Chi-square P = 0.253
Clerk	21 (52.5)	27 (67.5)	
Worker	3 (7.5)	0 (0)	
Private business	15 (37.5)	12 (30)	
Retired	1 (2.5)	1 (2.5)	
Family members			Mann-Whitney P = 0.352
3	10 (25)	15 (37.5)	
4	24 (60)	22 (55)	
5	6 (15)	3 (7.5)	

Table 3. The Comparison of Knowledge, Attitude and Practice of Female Adolescents About Health in Puberty, Between Two Groups of "Skills-Based Education" with "Lecture-Based Education"

Domains	Skilled-Based n = 40	Lecture-Based n = 40	T-Test (P)
	Mean ± SD	Mean ± SD	
Knowledge			
Before intervention	65 ± 20	59 ± 28	0.281
2 weeks after intervention	87 ± 15	73 ± 23	0.002
2 months after intervention	86 ± 17	67 ± 23	< 0.001
Attitude			
Before intervention	57 ± 15	63 ± 16	0.094
Immediately after intervention	71 ± 15	64 ± 16	0.045
2 months after intervention	72 ± 14	64 ± 17	0.034
Before intervention	55 ± 18	47 ± 18	0.046
Practice			
Immediately after intervention	60 ± 18	51 ± 18	0.057
2 months after intervention	58 ± 20	51 ± 19	0.125

Scores are calculated as the percent, 76654.6875

Table 4. The Comparison of Knowledge, Attitude and Practice of the Adolescents about Puberty in the Skills-Based Education Group, Before and After the Intervention

Domains	Skills-Based n = 40			RM ANOVA (P)
	Before Intervention Mean ± SD	Immediately After Intervention Mean ± SD	2 Months After Intervention Mean ± SD	
Knowledge	65 ± 20	87 ± 15	86 ± 17	< 0.001
Attitude	57 ± 15	71 ± 15	72 ± 14	< 0.001
Practice	55 ± 18	60 ± 18	58 ± 20	0.153

Scores are calculated as the percent

Table 5. The Comparison of Knowledge, Attitude and Practice of the Adolescents about Puberty in the Lecture-Based Education Group, Before and After the Intervention

Domains	Lecture-Based Education Group N = 40			RMANOVA (P)
	Before intervention Mean ± SD	Immediately after intervention Mean ± SD	2 months after intervention Mean ± SD	
Knowledge	59 ± 28	73 ± 23	67 ± 23	< 0.001
Attitude	63 ± 16	64 ± 16	64 ± 17	0.787
Practice	47 ± 18	51 ± 18	51 ± 19	0.317

Scores are calculated as the percent

Comparing the knowledge, the attitude of the adolescents about puberty in the skills-based education group, before and after the intervention, showed a significant increase immediately and after two months of intervention. This increase was not significant in their practice ($P < 0.001$) (Table 4).

The comparison of the knowledge of the adolescents about puberty in the lecture-based education group, before and after the intervention, showed a significant increase immediately and after two months of intervention. This increase was not significant about their attitude ($P = 0.787$) and practice ($P > 0.05$) (Table 5).

DISCUSSION

This study is the first experimental comparative study on the effects of an SBHE method with a lecture-based method on knowledge, attitude, and practice of female adolescents about puberty and menstrual health in Iran. Finding demonstrated SBHE using participatory methods of teaching was significantly more effective than a lecture-based method on improving the knowledge and attitude of the participants. However, there was not a significant difference between groups regarding their practice. A few other studies concluded that participatory methods such as peer education are more effective than lectures on knowledge, attitude, and practice of female adolescents about puberty and menstrual hygiene [9, 44, 45]. Participatory methods of teaching are more effective and constant than structured methods of teaching because the learners contribute actively to the process of learning [46]. It seems that the items in the practice assessment section of the questionnaire, such as "providing information to peers about health care during menstruation," "participating in the educational programs about health during puberty," and "talking with mother about PMS," need longer time to be practiced.

Before and after comparisons of the interventions, it was demonstrated that; "skills-based" and "lecture-based' education were both effective in improving the knowledge of participants. However, Attitude was improved only in the skills-based education group. This result is consistent with a previous study that showed that the peer education method is more effective than self-education in improving adolescents' attitudes towards health in puberty [47]. Small group discussion as a participatory method of education was also more effective than a pamphlet in improving adolescents' attitudes towards health in puberty [48]. Also, the comparison of lectures with educational packages demonstrated no significant difference in the attitude of girls about health in puberty [49]. Besides, more time was necessary to change the attitude of girls towards menstrual health [50]. This can postulate that attitude formed from individuals' beliefs, and thus, classic lecture-based methods of teaching are usually not much effective in changing attitudes.

Before and after comparison of practice in of groups also showed both educational methods did not change the practice of adolescents about health in puberty. There is no doubt that education improves knowledge immediately while changing attitude, and especially practice needs more time [51]. Besides, as mentioned above, some items in the practice assessment section of the questionnaire include providing information to peers about health care during menstruation, participating in the educational programs about health during puberty and talking with mother about PMS, needs time to be practiced. Regarding the short duration of the current intervention, it may be reasonable to expect that increasing education duration may allow more time for changing practice. Besides, if more intensive parental involvement strategies were implemented, an improvement in the practice could occur. Conducting long-term follow-up measures is also essential for determining behavior change [52].

LIMITATIONS

The only limitation of this trial seems to be related to performing the study on female school students. Thus, the results are generalizable to girls and not boys who may be interested in a different method of teaching skills. Also, the characteristics of street children are different from school children, and different studies are required. Therefore, similar studies are recommended for male school students and also street children.

Another limitation was the short training hours of the study. It is suggested to run the program for a more extended period to improve the attitude and Practice of participants.

CONCLUSION

SBHE is more effective than a lecture-based method in improving the knowledge and attitude of female adolescents about puberty and menstrual health. Therefore, SBHE is recommended to be used for promoting health in puberty.

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Ethical Consideration

The ethical committee approved the study of Shahid Beheshti University of Medical Sciences (the reference number 1392-1-86-11770-14343). It was also registered in the Iranian Registry of Clinical Trial IRCT201311278801N6). Written informed consent

was obtained from all individual participants and their parents. Therefore, his study was conducted following the Declaration of Helsinki.

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Authors' Contributions
All authors contributed equally to the design of the study. MS and SN drafted the manuscript and revision of it. All authors read and approved the final manuscript.

Conflicts of Interest
The authors declare no conflict of interest

REFERENCES

1. Azh N, Nahidi F, Ozgoli G, Ardalan G. Social mobilization for safe transition from adolescence: a qualitative research in Iran. Int J Adolesc Med Health. 2017;30(6). **doi:** 10.1515/ijamh-2016-0111 **pmid:** 29168954
2. Simbar M, Alizadeh S, Hajifoghaha M, Golezar S. Review of Iranian Adolescents' Educational Needs for Sexual and Reproductive Health. J Isfahan Med School. 2017;34(412):1563-72.
3. Dorn LD, Hostinar CE, Susman EJ, Pervanidou P. Conceptualizing Puberty as a Window of Opportunity for Impacting Health and Well-Being Across the Life Span. Journal of Research on Adolescence. 2019;29(1):155-76. **doi:** 10.1111/jora.12431 **pmid:** 30869846
4. Eslamimehr F, Ramezankhani A, Khodakarim S, Rakhshani F. Assessment of puberty health behaviour and it's affecting factors in female secondary school students in Khamir city during 2015-2016. J Health Field. 2016;4(2):11-8.
5. Golchin NAH, Hamzehgardeshi Z, Fakhri M, Hamzehgardeshi L. The experience of puberty in Iranian adolescent girls: a qualitative content analysis. BMC public health. 2012;12(1):698. **doi:** 10.1186/1471-2458-12-698 **pmid:** 22925369
6. Saghi S, Mirghafourvand M, Alizadeh Charandabi SM, Nabighadim A, Seidi S, Rahmani A. Knowledge and attitude about pubertal health and their socio-demographic predictors in Iranian adolescents. Int J Adolesc Med Health. 2016;28(4):397-405. **doi:** 10.1515/ijamh-2015-0016 **pmid:** 26368043
7. Srivastava U, Singh KK. Exploring Knowledge and Perceptions of School Adolescents regarding Pubertal Changes and Reproductive Health. Ind J Youth Adol Health. 2017;4(1):26-35. **doi:** 10.24321/2349.2880.201705
8. Salehin S, Simbar M, Keshavarz Z, Nasiri M. Empowerment of Mothers Concerning Female Adolescent's Reproductive Health in Iran: A Qualitative Study. Crescent J Med Biolog Sci. 2019;6(3):309-17.
9. Ghasemi V, Simbar M, Rashidi Fakari F, Kiani Z. The Effect of Peer Education on Health Promotion of Iranian Adolescents: A Systematic Review. Int J Pediatr. 2019;7(3):9139-57.
10. Lipsitz J. Successful schools for young adolescents. New York Imprint Routledge; 2019.
11. Wolff M, Wagner MJ, Poznanski S, Schiller J, Santen S. Not another boring lecture: engaging learners with active learning techniques. J Emergency Med. 2015;48(1):85-93. **doi:** 10.1016/j.jemermed.2014.09.010 **pmid:** 25440868
12. World Health Organization (WHO). Skills for health: skills-based health education including life skills: an important component of a child-friendly/health-promoting school. 2003.
13. Aldinger C, Whitman CV. Skills for health: skills-based health education to teach life skills. Health Promot School Int Advance Theory Evaluat Pract. 2005:151.
14. Curran T, Wexler L. School-based positive youth development: A systematic review of the literature. J School Health. 2017;87(1):71-80. **doi:** 10.1111/josh.12467 **pmid:** 27917486
15. The United Nations Children's Fund (UNICEF). Life Skills-Based Education in South Asia. UNICEF; 2005
16. Bharath S, Kumar K. Health Promotion Using Life Skills Education Approach for Adolescents in Schools--Development of a Model. J India Associat Child Adolescent Mental Health. 2008;4(1):5-11.
17. Kishindo P. Life skills education and reproductive health education: preliminary findings from the non-biomedical interventions into HIV and AIDS study: UNESCO; 2011. 18]. Available from: http://hivhealthclearinghouse.unesco.org/library/documents/life-skills-education-and-reproductive-health-education-preliminary-findings-non.
18. Khushabi K, Nikkhah H, Moradi S. An Investigation of the Life Skills Knowledge among Female Students of Tehran City Universities. Sci J Hamadan Univ Med Sci. 2008;15(3):67-72.
19. Babazadeh T, Fathi B, Shaghaghi A, Allahverdipour H. Lessons learnt from pilot field test of a comprehensive advocacy program to support health promoting schools' project in Iran. Health Promot Perspective. 2017;7(1):14-21. **doi:** 10.15171/hpp.2017.04 **pmid:** 28058237
20. Gharibi H, Gholizadeh Z, Fathi Azar E, Adib U. Evaluation of the status of junior and senior high school students of Kurdistan province in terms of life skills. Studies Curriculum 2008;3(11):118-43.
21. Simbar M, Alizadeh S, Hajifoghaha M, Golzar S. Review of iranian adolescents'educational needs for sexual and reproductive health. J Isfahan Med School. 2017;34(412):1563-72.
22. Adeokun LA, Ricketts OL, Ajuwon AJ, Ladipo OA. Sexual and reproductive health knowledge, behaviour and education needs of in-school adolescents in northern Nigeria. Africa J Reproductive Health. 2009;13(4).
23. Rahmati R. Evaluation of educational effectiveness in prevention of teens' tendency towards drug abuse. J Basic Appl Sci Res. 2012;2(7):6903-10.
24. Weichold K, Brambosch A, Silbereisen RK. Do Girls Profit More? Gender-Specific Effectiveness of a Life Skills Program against Alcohol Consumption in Early Adolescence. J Early Adolescence. 2012;32(2):200-25. **doi:** 10.1177/0272431610384489
25. Mngadi PT, Faxelid E, Zwane IT, Hojer B, Ransjo-Arvidson AB. Health providers' perceptions of adolescent sexual and reproductive health care in Swaziland. Int Nurs Rev. 2008;55(2):148-55. **doi:** 10.1111/j.1466-7657.2007.00625.x **pmid:** 18477098
26. Rezaei E, Malekpour M, Oreyzi H. The effect of the" life-skills" training on the stress and youths' stress coping methods in pseudofamily centers. Clinic Psychol Personal. 2009;1(34):21-8.
27. Mirzamani SM, Azvar F, Dolatshahi B, Askari A. Efficacy of life skills training on reduce depressive symptoms in student population. J Res Behav Sci. 2012;10(2):124-32.
28. Manee FM, Khouiee SA, Zaree H. The effect of three life skills instruction on the general health of college freshmen. J Mazandaran Univ Med Sci. 2011;21(85):127-37.
29. Baghaei-Moghadam G, Malekpour M, Amiri Sh, Mowlavi H. The effectiveness of life skills training on anxiety, happiness and anger control of adolescence with physical-motor disability. J Behav Sci. 2012;5(4):305-10.
30. Simbar M, Aarabi Z, Keshavarz Z, Ramezani-Tehrani F, Baghestani AR. Promotion of physical activity of adolescents by skill-based health education. Health Educat. 2017;117(2):207-14. **doi:** 10.1108/HE-09-2016-0037

31. Rad EF, Keshavarz Z, Simbar M, Nasiri M, Mehraliyan H. The Impact of a School-Based Intervention Using the PBSEIM Model on Health Promoting Behaviors and Self-Care in Adolescent Females. Advance Nurs Midwife. 2017;27(1):15-9.
32. Safari M, Yazdanpah B, Mahmoudi F, Yaghobean N. Comparing students' rate of learning through lecturing and peer group teaching and study their viewpoints. Res Med Educat. 2018;10(3):24-34. **doi:** 10.29252/rme.10.3.24
33. Alimoradi Z, Kariman N, Ahmadi F, Simbar M. Preparation for sexual and reproductive self-care in Iranian adolescent girls: a qualitative study. Int J Adolescent Med Health. 2017;30(1). **doi:** 10.1515/ijamh-2016-0094 **pmid:** 28525319
34. Alimordi Z, Simbar M. Puberty health education for Iranian adolescent girls: Challenges and priorities to design school - based interventions for mothers and daughters. Payesh. 2014;13(5):621-36.
35. Alimoradi Z, Kariman N, Simbar M, Ahmadi F. Contributing factors to high-risk sexual behaviors among Iranian adolescent girls: A systematic review. Int J Communit Based Nurs Midwife. 2017;5(1):2-12.
36. UNICEF. Guidance on Menstrual Health and Hygiene. first ed. New York, USA: UNICEF; 2019.
37. World Health Organization. Menstrual Hygiene Day2018. Available from: https://www.who.int/life-course/news/events/menstrual-hygiene-day-2018/en/.
38. Creswell JW, Shope R, Plano Clark VL, Green DO. How interpretive qualitative research extends mixed methods research. Res School. 2006 13(1):1-11.
39. Fisher MM, Alderman EM, Kreipe RE, Rosenfeld WD. AAP Textbook of Adolescent Health Care. USA: American Academy of Pediatrics; 2011
40. Lawshe CH. A quantitative approach to content validity 1. Personnel Psychol. 1975;28(4):563-75. **doi:** 0.1111/j.1744-6570.1975.tb01393.x
41. Waltz CF, Strickland OL, Lenz ER. Measurement in nursing and health research. London, England: Springer; 2010.
42. Polit D, Beck T. Nursing Research. Method, Appraisal and Utilization. Philadelphia, PA: Lippincott; 2006.
43. Yarmohammadi Vasel M, Narenjiha H, Rafiey H. Developing and Validation of Life Skills Inventory for Substance Abusers. Social Welfare. 2011;10(39):151-6.
44. Ayaz S, Açıl D. Comparison of peer education and the classic training method for school aged children regarding smoking and its dangers. J Pediatr Nurs. 2015;30(3):e3-e12. **doi:** 10.1016/j.pedn.2014.11.009 **pmid:** 25613544
45. Tamiztousiorcid T, Rafiee M, Rakhshanizadeh F, Azizi M, Khakpour M, Khorasani F, et al. Education for Menstrual Hygiene Promotion in Iranian Girls: A Systematic Review and Meta-Analysis. Int J Pediatr Mashad. 2019;7(6):9507-15.
46. Haruna H, Hu X, Chu SKW. Adolescent School-Based Sexual Health Education and Training: A Literature Review on Teaching and Learning Strategies. Glob J Health Sci. 2018;10:172-9. **doi:** 10.5539/gjhs.v10n3p172
47. Nouri Sistani M, Merghati KE, Taghdisi M. Promoting Knowledge, Attitude and Practices (KAP) of the Mothers in their Girls Pubertal Health Based on Peer Education Approach. J Babol Univ Med Sci (JBUMS). 2010;11(6):33-9.
48. Mohammadzadeh Z, Allame Z, Shahroki S, Oriezi H, Marasi MR. Puberty Health Education in Iranian Teenagers: Self - Learning or Lecture and Discussion Panel ? Iran J Med Educat. 2001;1(3):3-6.
49. Majlessi F, Rahimi A, Mahmoudi M, Hosseinzadeh P. The impact of lecture and educational package methods in knowledge and attitude of teenage girls on puberty health. J Hormozgan Univ Med Sci (HMJ). 2012;15(4):327-32.
50. Chiou MH, Wang HH, Yang YH. Effect of systematic menstrual health education on dysmenorrheic female adolescents' knowledge, attitudes, and self-care behavior. Kaohsiung J Med Sci. 2007;23(4):183-90. **doi:** 10.1016/S1607-551X(09)70395-X
51. Brown ECB, Buchan DS, Drignei D, Wyatt FB, Kilgore L, Cavana J, et al. Primary school children's health behaviors, attitudes, and body mass index after a 10-week lifestyle intervention with follow-up. Frontiers Pediatr. 2018;6:137. **doi:** 10.3389/fped.2018.00137 **pmid:** 29868527
52. Jones RA, Sinn N, Campbell KJ, Hesketh K, Denney-Wilson E, Morgan PJ, et al. The importance of long-term follow-up in child and adolescent obesity prevention interventions. Int J Pediatr Obesity. 2011;6(3-4):178-81. **doi:** 10.3109/17477166.2011.575155 **pmid:** 21612335