

## Original Article

# The Effect of Motivational Interview on Puberty Knowledge and Practice among Adolescent Girls

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### ABSTRACT

**Background:** Adolescence is a critical stage of life with a significant role in reproduction and fertility. Interventions are needed to promote the health of adolescent girls as prospective mothers. **Objectives:** This study aimed to investigate the effects of motivational interviewing on adolescent girls' puberty knowledge and practice. **Methods:** This quasi-experimental study was conducted in 2018 on 240 eighth-grade female students recruited through multistage sampling from ten high schools in Shahroud, Iran. Schools were allocated into an intervention group and a control group through simple randomization. Participants in the intervention group received a five-session puberty-related motivational interviewing intervention. Puberty knowledge and practice in both groups were assessed before, immediately after, and 1 month after the intervention. Data were analyzed through the Chi-square and the independent-samples *t*-tests and the repeated-measures analysis of variance. **Results:** Participants' age was  $14.47 \pm 0.51$  years, on average. About 70% of them had poor or moderate puberty knowledge. Although there was no statistically significant between-group difference respecting the mean scores of puberty knowledge and practice at pretest ( $P > 0.05$ ), the mean scores of puberty knowledge and practice in the intervention group were significantly higher than the control group at both posttests ( $P = 0.001$ ). **Conclusion:** Motivational interviewing is effective in improving adolescent girls' puberty knowledge and practice.

**KEYWORDS:** Adolescent, Knowledge, Motivational interview, Practice, Puberty health

## INTRODUCTION

Adolescent reproductive health is a major health concern and priority in the world. The United Nations reported that in 2018, adolescents comprised

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more than 23.5% of the world population.<sup>[1]</sup> Half of the adolescents in the world seem to be at risk for sexually transmitted diseases, sexual abuse, unwanted pregnancy, preterm labor, substance abuse, academic failure, personal health problems, poor nutrition, and immobility. These issues highlight the importance of paying great attention to their health.<sup>[2]</sup>

Puberty is a turning point in adolescence because it is associated with various physical, psychological, and social changes.<sup>[1,2]</sup> Yet, studies show that adolescent girls have limited knowledge about puberty, menstruation, and menstrual hygiene.<sup>[3]</sup> The main causes of such limited knowledge are mothers' and adolescent girls' shame over talking about puberty,<sup>[4]</sup> mothers' and teachers' limited knowledge about puberty and its associated problems, and their negligence in providing puberty-related education to adolescents.<sup>[2]</sup>

In recent years, the expansion of educational programs on puberty in schools, families, and media has relatively improved adolescents' knowledge of puberty.<sup>[2]</sup> Teaching methods can significantly affect the effectiveness of puberty-related educational programs. In most puberty-related educational programs in Iran, teaching methods such as lectures, pamphlets, and educational packages are used.<sup>[3,5,6]</sup> Some studies compared the effects of lectures with other teaching methods such as educational packages,<sup>[7]</sup> peer-group education, game playing, and role-playing.<sup>[2,8-10]</sup>

Motivational interview (MI) is a client-centered method for education and behavior modification. The main goals of MI are to eliminate clients' doubts, encourage them to express their concerns and reasons for behavior modification, and increase their intrinsic motivation for change.<sup>[11]</sup> It directly addresses and resolves resistance to change, which is an important and common problem in behavior modification. Therefore, it helps to manage health problems through modifying unhealthy behaviors and habits and promoting adherence to healthy behaviors.<sup>[12]</sup>

Previous studies reported that MI reduces high-risk health-related behaviors such as smoking, alcohol use, extramarital sex, aggression, and gambling and promotes weight loss, treatment adherence, physical activity, treatment outcomes, and engagement in health-promoting behaviors among different populations including patients with asthma and diabetes mellitus.<sup>[11,13]</sup> MI was also found to be effective in modifying high-risk behaviors among adolescents such as aggression, delinquency, over-eating, and immobility.<sup>[12,14]</sup> A few studies also evaluated the effects of puberty-related interventions on prospective

reproductive health among adolescent girls.<sup>[15,16]</sup> However, no study is available on the effect of MI on adolescent girls' puberty knowledge and practice.

## Objectives

This study aimed to investigate the effects of MI on adolescent girls' puberty knowledge and practice.

## METHODS

### Design and participants

This quasi-experimental study was conducted in 2018. The study setting was public and nonprofit high schools in Shahroud, Iran. Participants were 240 high school female students who were selected through multistage sampling. Inclusion criteria were Iranian nationality, no significant life event in the family (such as divorce and death) in the past 6 months, no history of using psychiatric drugs, willingness to participate in the study, and informed consent for participation. The exclusion criterion was the reluctance to stay in the study.

For sampling, three main groups were initially defined, namely public downtown, public suburban, and nonprofit schools, and then, ten schools were selected from these clusters. After that, five schools (i.e., two public downtown, two public suburban, and one nonprofit schools) were randomly assigned to an intervention group and the other five schools were assigned to a control group. One eighth-grade class was randomly selected from each school and all of its students were enrolled in the study. Therefore, a total of 240 students were recruited for the study, of them 123 were in the control group and 117 were in the intervention group.

The sample size was calculated using the results of a former study, in which based on a scale of 15, the mean girls' knowledge of puberty hygiene score increased from  $8.2 \pm 2$  to  $9.8 \pm 1.8$  after the education.<sup>[17]</sup> With a confidence level of 99% (i.e., an alpha of 0.01) and a power of 90%, the sample size in each group was estimated to be 43. In this study, classes of students were studied as clusters. In cluster sampling, a design effect index is usually used to moderate the effect of interdependence within the cluster. This index is larger than one. In this study, the design effect was considered equal to 2; multiplying the number 43 by 2, the modified sample size for each group was estimated at 86. However, we increased it to 100 (totally 200) due to participants' probable withdrawal from the study. Since classes, and not students, were randomly selected, finally, 240 students entered into the two unequal groups (i.e., 123 and 117 ones in the control group and the intervention group, respectively).

### Data collection instruments

A demographic questionnaire and a puberty knowledge and practice questionnaire were used for data collection. The demographic questionnaire included items on the students' age and their parents' education level and occupation. The puberty knowledge and practice questionnaire was developed based on the Puberty Health Standard Questionnaire of the World Health Organization<sup>[18]</sup> as well as the questionnaires used in two former studies for the assessment of puberty knowledge and practice.<sup>[10,19]</sup> This researcher-made questionnaire consisted of 44 multiple-choice questions on puberty knowledge and 37 questions on puberty practice. Puberty knowledge questions were related to puberty, menstruation, and their associated problems (13 questions), nutrition and diet (nine questions), exercise and physical activity (six questions), smoking and drug abuse (seven questions), and sexually transmitted diseases and acquired immunodeficiency syndrome (nine questions). Correct answers to knowledge questions were scored 1 and incorrect answers were scored 0, resulting in a possible total score of 0–44. Scores <18 (i.e., the 25<sup>th</sup> percentile), 18–24 (i.e., the 25<sup>th</sup> and the 75<sup>th</sup> percentiles), and above 25 (i.e., the 75<sup>th</sup> percentile) were interpreted as poor, moderate, and sufficient puberty knowledge, respectively. The questions of the practice part were scored on a 4-point Likert scale as follows: 1: "Never;" 2: "Sometimes;" 3: "Often;" and 4: "Always." Two questions were reversely scored due to their negative wording. Therefore, the possible total score of the practice part of the questionnaire was 37–148. The content validity of the questionnaire was confirmed by a panel of experts and its Cronbach's alpha was 0.84. For test–retest stability assessment, thirty students twice completed the questionnaire with a 10-day interval. Test–retest correlation coefficient was 0.83.

### Intervention

Study intervention for participants in the intervention group was a five-session, 60–90 min MI program. Before MI sessions, one educational session was held (by the researcher) in the selected classes to provide students with educations about puberty, menstruation, their associated problems, healthy eating, exercise and physical activity, smoking and drug abuse, and sexually transmitted diseases. MI was implemented as proposed by Navidian *et al.*<sup>[15,20]</sup> and according to the protocol of MI.<sup>[20]</sup> In the first session, the aims of the study were discussed by the researcher, and then, participants were provided with explanations about the Bem theory<sup>[21]</sup> and the importance of behavior modification. Bem's theory states that whenever a person's sense of freedom and the right to choose is

threatened, the individual exhibits behaviors to show and restore lost freedom. Usually, people resist changing due to their sense of independence and freedom. MI leads to a change in behavior by increasing internal motivations rather than the external pressure, in which there is no compulsion to change behavior.<sup>[21]</sup> The aim of the second session was to persuade participants to express their feelings about the necessity of promoting their puberty hygiene and modifying their behaviors. In the third session, the short-term and long-term benefits of behavior modification, puberty hygiene, and puberty knowledge were explained. In the fourth session, values were discussed. Values include standards, qualities, and attributes that help define and set goals and activities. In the fifth session, tempting situations for behaviors were examined. Participants in the control group did not receive any puberty-related intervention during the study. The puberty knowledge and practice of all participants in both groups were assessed at three time points, namely before, immediately after, and 1 month after the study intervention. The questionnaires were completed by the students in the school in the presence of the researcher and during the class hours assigned to the researcher by the students. It should be explained that after the third measurement time point, two educational sessions on puberty were held for participants in the control group.

The participants and statistical counselors were blind to the study, and only researcher who performed the interventions was aware of the intervention and the control groups.

### Ethical considerations

This study was approved by the Ethics Committee of Shahroud University of Medical Sciences, Shahroud, Iran (code: IR.SHMU.REC.1396.144) and was registered in the Iranian Registry of Clinical Trials (code: IRCT20180209038675N1). The aims of the study were explained for participants and they were assured that their participation is voluntary. The informed consent form was presented to the students after the explanations related to the study's aims and methods so that the students and their families could sign and approve it. Data were managed confidentially, and the findings were reported anonymously.

### Data analysis

The SPSS software version 16.0 (SPSS Inc, Chicago, US) was employed for analyzing the data. The measures of descriptive statistics (including mean and standard deviation) were used for data description. Between-group comparisons respecting categorical and numerical variables were made using the Chi-square and the independent-samples *t*-tests, while within-group comparisons respecting the variations of the mean scores

of puberty knowledge and practice were made using the repeated-measures analysis of variance. The significance level was set at  $<0.05$ .

## RESULTS

In this study, 240 female students from ten schools were studied. As shown in Figure 1, none of the participants were excluded from the study. The mean age of all participants was  $14.47 \pm 0.51$ . The study groups did not significantly differ from each other, respecting participants' age and their parents' educational level and occupation [ $P > 0.05$ ; Table 1].

As illustrated in Table 1, before the intervention, the two groups did not significantly differ in terms of parents' education level, occupation, and the students' knowledge. Before the intervention, more than 30% of the participants ( $n = 77$ ) had sufficient puberty knowledge, while around 70% of them ( $n = 163$ ) had poor or moderate puberty knowledge.

The independent sample *t*-test showed that the between-group difference respecting the pretest

mean score of knowledge was not statistically significant ( $P = 0.23$ ). However, the mean score of knowledge in the intervention group was significantly higher than the control group at both the posttests [ $P < 0.05$ ; Table 2].

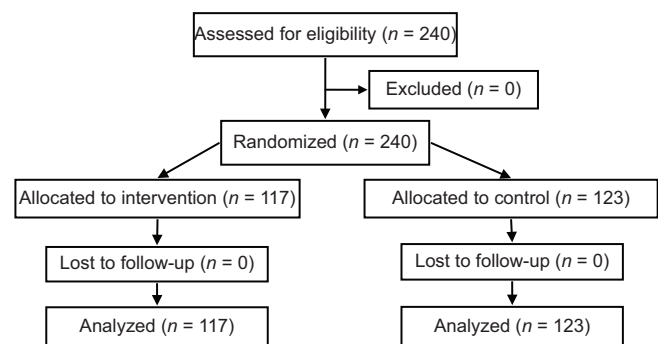
The results of the repeated-measures analysis showed that the variations of the mean scores of puberty knowledge and practice were statistically significant across the three measures time points [ $P < 0.001$ ; Table 2]. As the result of the Mauchly's sphericity test was significant, Greenhouse–Geisser analysis was used to examine the effects of time, group, and time-group interaction. The results showed that all these effects were significant [Table 2].

As shown in Table 2 and Figures 2 and 3, between-group differences respecting the pretest mean scores of puberty knowledge and practice were not statistically significant, while the mean scores of puberty knowledge and practice in the intervention group were significantly higher than the control group at both the posttests. In repeated measurement analysis, when the effect of time becomes significant, regardless of groups, knowledge increased over time. The significance of the group effect also means that regardless of time, knowledge and practice of the two groups are different. The significance of the interaction also means that changes in knowledge

**Table 1: Between-group comparisons respecting participants' and their parents' characteristics**

Characteristics	Group, mean $\pm$ SD		P
	Control	Intervention	
Age (year)	14.41 $\pm$ 0.49	14.53 $\pm$ 0.54	0.32
Father's level of education (year)	10.56 $\pm$ 3.55	10.42 $\pm$ 4.08	0.26
Mother's level of education (year)	10.08 $\pm$ 3.90	10.30 $\pm$ 3.08	0.57
Father's occupation, n (%)			0.12
Worker	11 (8.94)	27 (23.07)	
Employee	31 (25.2)	38 (32.47)	
Retired	14 (11.38)	5 (4.27)	
Self-employed	67 (54.47)	47 (40.17)	
Mother's occupation			0.18
Housewife	103 (83.73)	107 (91.45)	
Employed	20 (16.26)	10 (8.54)	

SD: Standard deviation

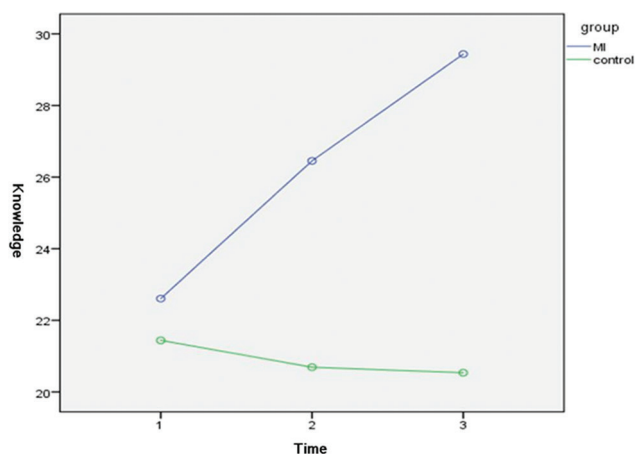


**Figure 1: The flow diagram of the study**

**Table 2: Comparison of the mean puberty knowledge and practice scores of the two groups over the three measurements**

Variable/time	Group, mean $\pm$ SD		P	Effect	
	Intervention	Control			
Knowledge					
Before	22.61 $\pm$ 3.84	21.44 $\pm$ 4.03	0.23	Time	<0.001
Immediately after	26.45 $\pm$ 3.49	20.69 $\pm$ 4.43	<0.001	Time-group	<0.001
1 month after	29.44 $\pm$ 3.51	20.54 $\pm$ 3.53	<0.001	Group	<0.001
Practice					
Before	106.56 $\pm$ 16.49	105.80 $\pm$ 17.92	0.74	Time	<0.001
Immediately after	119.00 $\pm$ 10.10	106.14 $\pm$ 14.59	<0.001	Time-group	<0.001
1 month after	121.86 $\pm$ 10.40	105.84 $\pm$ 13.80	<0.001	Group	<0.001

SD: Standard deviation



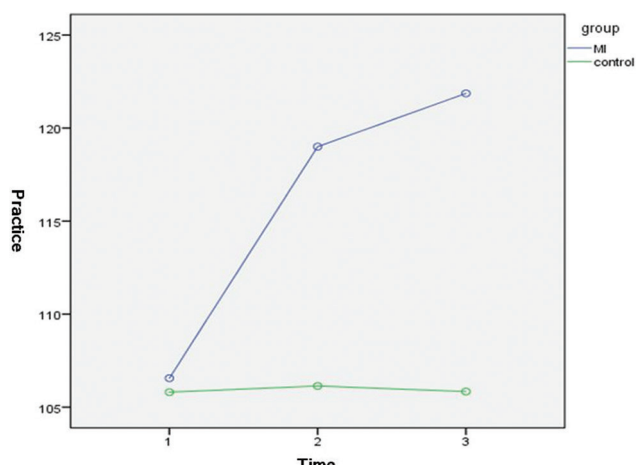
**Figure 2:** The mean scores of knowledge of puberty in the intervention and the control groups across the three measurement time points

and practice in the two groups are different, which can be attributed to the intervention.

## DISCUSSION

This study investigated the effects of MI on adolescent girls' puberty knowledge and practice. More than 30% of participants had sufficient puberty knowledge, while around 70% of them had poor or moderate puberty knowledge. This is in line with the findings of many earlier studies which reported that adolescents had limited puberty knowledge.<sup>[10,18]</sup> In contrast, a study reported that most adolescents had sufficient puberty knowledge.<sup>[22]</sup> Limited puberty knowledge among adolescent girls may be due to cultural issues, limited education on puberty at schools for adolescents and their parents, parents' limited puberty knowledge, and parents' and girls' shame over talking about puberty-related issues. Moreover, puberty-related educations are provided mostly using the lecture method.<sup>[5,23]</sup> Accordingly, quality puberty-related educations through books, magazines, and modern teaching methods are recommended for improving adolescent girls' and their parents' puberty knowledge.

The findings showed that while there was no statistically significant between-group difference respecting the pretest mean score of puberty knowledge, the mean score of knowledge in the intervention group was significantly higher than the control group at both the posttests. These findings imply the effectiveness of the MI intervention in significantly improving puberty knowledge. Of course, time may also have an effect, but since the whole process took only 2 months from the beginning to the end of the study, so it cannot be said that this significant increase is due to the passage of time. Former studies also reported the same finding.<sup>[12,13]</sup> Another study also showed that MI was effective in significantly



**Figure 3:** The mean scores of practice of puberty in the intervention and the control groups across the three measurement time points

changing high-school students' attitude, behavioral intention, and self-efficacy.<sup>[19]</sup> Similarly, a study showed that a one-session MI for 30 min significantly reduced dropout from an education and employment program for young adults.<sup>[24]</sup> Another study found MI effective in significantly improving nutrition students' behavioral skills so that 80% of participants reported that MI made their counseling process easier.<sup>[25]</sup> All these findings confirm the positive effects of MI on health-related behaviors. Of course, the number of posttest assessments and the number of MI sessions in the present study were more than the aforementioned studies.

MI in the present study was used to improve students' knowledge and practice and their senses of responsibility and confidence. However, previous studies used it as a method to change knowledge about acquired immunodeficiency syndrome and behaviors such as smoking, alcohol use, aggression, physical exercise, and healthy nutrition.<sup>[26-29]</sup> Most studies in this area compared MI with other teaching methods such as lecture<sup>[23,30]</sup> and reported that MI seemed to produce more beneficial results than other teaching methods.<sup>[31]</sup>

We also found that while there was no statistically significant difference between the groups respecting the mean score of puberty practice at baseline, the mean score of puberty practice in the intervention group was significantly higher than the control group at both the posttests. Moreover, the effects of time, group, and time-group interaction on the mean score of puberty practice were statistically significant. It cannot be said that only time has significantly increased awareness and performance, in which case we must also have a significant increase in awareness and performance in the control group, which is not the case, and the awareness and performance of the control group have remained constant.

All these findings indicate the effectiveness of the MI intervention of the study in significantly improving puberty practice among adolescent girls.

Among the strengths of the present study was its larger sample size compared with most motivational interviewing studies. One of the study limitations was participants' limited collaboration which was managed through providing them with some gifts (mainly stationeries such as notebook and pen).

## CONCLUSION

This study concludes that MI is effective in significantly improving puberty knowledge and practice among adolescent girls. Thus, MI can be used to improve puberty-related outcomes, promote healthy puberty-related behaviors, and reduce puberty-related problems among adolescents. Studies are also recommended to compare the effects of MI with the effects of other teaching methods such as lecture and face-to-face counseling.

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## Conflicts of interest

There are no conflicts of interest.

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