



## Effect of physical and psychological puberty training on general well being and its dimensions in girl students

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### Introduction

According to the world health organization, adolescence is defined as the age between 10 and 19 years that comprises a transitional stage between childhood and adulthood [1]. Adolescence is a time of change in the biological, social, and psychological landscapes of individuals' lives [2]. Although most adolescents successfully adjust to these changes, for some adolescents this period is challenging [3]. Pubertal development, a hallmark change of adolescence, has been the focus of much research

### Abstract

Transition through puberty is marked by an increased risk for the onset of a range of health problems, particularly those related to the control of behavior and emotion. The aim of this study was to determine the effectiveness of training puberty (physical and psychological matters) in general well being and its dimensions in girl adolescents. This was a quasi-experimental study in which the target population included all girl students at the first grade of high school in Jiroft, Iran. 40 students (20 in the experimental group and 20 in the control group) was selected using multi stage sampling method. The experimental group was educated in twelve-90- minute sessions. The content of the educational course included physical signs of puberty, physiologic change in menstrual period, hygiene, nutrition, and psychological changes of puberty. The participants completed the Skehill's general well being questionnaire before and after the intervention. Covariance analysis revealed the efficacy of education on the enhancement of psychological well being and psychological distress reduction. Therefore, it is recommended to implement health educational programs about physical and psychological matters during puberty to elementary and secondary school students to improve their mental health.

**Keywords:** Adolescent, Girl, Mental Health, Puberty

and its association with adolescent adjustment, has been well documented [2]. Past research suggests that one possible antecedent of adults' well being involves their experiences of physical maturation during adolescence. As the child's body is transformed into its adult form, physical changes set a variety of psychosocial transformations in motion [4]. During puberty, hormonal, psychological, cognitive, and physical changes occur simultaneously and interactively making

physiological development a challenge; adolescents have to face, with its emotional, social, and behavioral dimensions [5]. Because puberty is the most salient developmental milestone during early adolescence, puberty has become one of the objects of studies to understand the emergence of psychopathology [6]. Puberty is a key developmental window for understanding physical, emotional, cognitive, and social changes, which may mediate the emergence of a broad range of behavioral, emotional health problems during adolescent development [7]. The term puberty refers to the sum of all the corporal physiological changes taking place in adolescence, which leads to sexual maturation [8]. During puberty, individuals gain around 16% of their mature height and women are double in their body weight. Transition through puberty is often defined by the development of external secondary sexual characteristics, which in girls are breast and pubic hair development [9].

Physical development can explain why adolescent girls' psychological well being diminishes [10]. Girls are socialized to feel negatively about their bodies and normal pubertal bodily changes, such as curviness and increased body mass [11]. Data over the last four decades have confirmed that puberty is a significant risk factor for the development of eating disorders and eating disorder symptoms in girls [12].

As adolescents mature, they experience emotional changes linked to perceptions of self and others, with increased negative emotionality from the early to middle adolescence periods. Other typical changes in the developmental sequence of adolescence include alterations in cognitive and thinking patterns, which are also reflected in social relationships [13]. Early adolescence is a time when emotional highs and lows occur more frequently. Young adolescents can be in top of the world at one moment and down in the dumps at the next [14]. A growing number of studies have shown that adolescents who have difficulties in identifying, describing, and experiencing their emotions have higher rate of both depressive and anxiety symptoms [15]. Benjet and Hernandez-Guzman [6] examined

the role of pubertal development in depression, externalizing behavior problems, self-esteem, and body image of 951 Mexican adolescents. The main finding of study was that the experience of menarche adversely affected adolescent girls' psychological well being, most specifically in terms of depressive symptoms. Yet, relatively little is found in the empirical literature on the teaching effectiveness of puberty curricula [16]. Heinicke et al. [17] evaluated the effect of an Internet-based intervention on seventy-three adolescent girls and found clinically significant improvements in body dissatisfaction, eating disorders, and depression at post-intervention and follow-up. Cousineau et al. [18] tested the efficacy of an Internet-based prevention program, *Trouble on the Tightrope: In Search of Skateboard Sam*, in improving pubertal knowledge, body esteem, and self-esteem. Findings indicated that the intervention was beneficial for those students.

Many studies in Iran have investigated the effect of puberty training on mental health of girls so far, including a study by Agha yousefi et al. [19] about the effect of puberty and menstrual hygiene training on mental health of girls showing that mental health improved after training.

Previous studies in Iran have tended to view puberty as a unitary physical process, or the physical signs of puberty, with little or no attention to psychological changes of puberty. It is crucial to consider both processes when examining the role of puberty in health and behavioral development. Therefore, the aim of this study was to determine the effectiveness of puberty training program (physical and psychological matters) on high school girls' general well being and its dimensions; namely, psychological well being and psychological distress.

## Method

The present study was a quasi-experimental research designed as pretest-posttest using control group. The population of the study comprised all female students studied at

the first grade of high school in Jiroft, Iran, in 2013. Boorg and Gall [20] have suggested the sample size of 15 participants per group for experimental, quasi-experimental, and non-experimental researches. Therefore, the study sample included 40 students, 20 in experimental group and 20 in control group. The sampling was conducted according to multi stage method. Among the high schools of Jiroft, one high school was selected randomly and among 4 classes of first grade at the school, 2 classes were selected randomly. One class was assigned to the experiment group and the other class assigned to the control group. The inclusion criteria were as follows: studying in high school, and not participating simultaneously in any other programs. The only exclusion criteria of this study was reluctance to participate. Participants were assured of confidentiality and informed consent in written format was acquired from each them. Also, this study was approved, and was financially supported by the Research Committee of Faculty of Psychology and Educational Sciences of Allameh Tabataba'i University. The used questionnaire in this research was as follows:

Skehill' General Well being questionnaire was used for data collection. Psychological well being (10 items) and distress (10 items), both within the same month, were assessed using the 20-item General Well being (GWB) scale. Each statement of the GWB asks the respondents to rate how often they have felt, or to what extent they have felt the description within the past month. The respondent has six choices ranging from " All of the time" to " None of the time", for questions such as " During the past month, how much of the time did you generally enjoy things?", and from " Always" to "Never" for questions such as " When you got up in the morning, during the past month, how often did you expect to have an interesting day?". The scale was coded so that a high score on well being indicated greater well being, and high score on distress indicated greater distress. The 20 items of the GWB were derived from Veit and Ware's 38-item Mental Health Index (MHI). Skehill, using exploratory and

confirmatory factor analytic methods, reported two-factor model of the GWB, psychological well being and psychological distress. Skehill also reported reliability of questionnaire running test-retest and Cronbach's alpha. Psychological well being subscale displayed a substantial Cronbach's  $\alpha$  of 0.90 at Time One, and  $\alpha$  of 0.88 at Time Two. The psychological distress subscale also displayed a substantial  $\alpha$  of = 0.89 at Time One, and  $\alpha$  of 0.91 at Time Two. These two subscales was found to be highly correlated with each other at Time One ( $r=-0.72$ ) and Time Two ( $r=-0.6$ ) [21]. This questionnaire first was translated into Persian by Alizade et al. [22] To gain validity, the questionnaire was sent by Alizadeh et al. to three professors and finally, its face and content validity were approved. Alizade et al. calculated the reliability of questionnaire using Cronbach's alpha and achieved the reliability of 0.70 [22].

Using Cronbachs' alpha, the present study determined the reliability of whole General well being scale and its subscales (including psychological well being and psychological distress) as, 0.69, 0.89, and 0.85, respectively. Having the permission of Department of Education, the researchers conducted this research. The process was follows: In the first session after being familiar with students, the researcher accomplished the pretest on both control and experimental groups individually. The post test was taken after the last session. During this time, the control group was under routine, normal supervision and did not participate in any training programs related to puberty. However, due to ethical consideration, when the study ended, the control group were allowed to participate in our puberty education program. In order to meet ethical principles, some explanations were presented to the experimental group about the study and by giving their consent; the researchers ensured that the participants and their parents were satisfied with participating in the study. Then, the experimental group was trained in twelve-90-minute sessions. The intervention program included lectures, questions and answers, role

playing, and group discussion.

The intervention program content comprised matters about adolescence, puberty, and physical changes such as weight and height increase, the growth of breast and body hair, female reproductive system, menstrual cycle, hygiene during menstruation, menstrual disorders, ways of controlling and pain reduction, emotional and cognitive changes, including egocentrism, imaginary audience, personal fable and invulnerability, training of cognitive control skills, including attention control, controlling obtrusive thoughts, determining aims and planning, training of decision making skills and problem solving, identification and recognition of various emotion inside oneself and the others, regulation the sever emotions by cognitive reevaluation techniques, the change in concentration, positive interpretation of situation and delaying, training communicative skills (including listening, showing the feeling, saying No), daring and knowing each other feeling, anger management skills, calming techniques, and relaxation.

The SPSS-18 was used to analyze the data in parametric tests. Moreover, descriptive statistics (standard deviation and mean) was run to summarize and organize the data. The analytical statics such as covariate analysis was used to assess significant differences between experimental and control groups in terms of posttest score means after controlling for pretest score means. The level of significance was set at  $p < 0.05$ . In addition, Shapiro Wilks test was run to check the normality of scores distribution.

### Results

Demographic characteristics of the participants showed that the mean age was 13.5, with a standard deviation of 3.11 and the age range was between 12 and 14 years. Chi-square test showed that there is not a significant relationship between the experimental and control groups considering the variables of education level, father's occupation, mother's occupation, father's education, and mother's education, ( $p > 0.05$ ) (Table 1).

**Table 1** The comparison of demographic data between control and experimental groups

		Experimental group		Control group		Sig.
		N	%	N	%	
Father's education	Under high school diploma	3	15	4	20	0.711
	High school diploma	5	25	6	30	
	Academic degree	12	60	10	50	
Mother's education	Under high school diploma	5	25	6	30	0.699
	High school diploma	6	30	7	35	
	Academic degree	9	45	7	35	
Father's occupation	Employee	8	40	6	30	0.696
	Self-employee	12	60	14	70	
Mother's occupation	Housekeeper	12	60	13	65	0.811
	Practitioner	8	40	7	35	

The comparison of mean scores of general well being and its dimensions experimental and control groups in pretest and posttest is presented in Table 2.

As shown in Table 2, in the experimental group compared to control group, the mean scores of posttest of general well being and psychological well being are more than

those of the pretest. Furthermore, in the psychological distress in the experimental group compared to the control group, the mean scores of pretest is more than that of posttest. The results of Paired t-test also showed that the differences of mean scores between pretest and posttest are significant in the experimental group.

**Table 2** The comparison of mean scores of studied variables between experimental and control groups concerning pretest and posttest

Variable	Groups	Pretest		Posttest		Paired t-test	Sig.
		N	M±SD	M±SD	Mean scores differences		
General well being	Experimental	20	69.45±10.64	73.05±2.68	3.6	4.11	0.013
	Control	20	68.80±8.85	68.85±6.67	0.05	1.33	0.678
Psychological well being	Experimental	20	40.30±10.58	45.90±6.52	5.6	5.32	0.002
	Control	20	36.25±8.74	36.10±6.39	-0.15	1.78	0.537
Psychological distress	Experimental	20	27.40±7.63	17.35±5.43	10.05	7.36	0.003
	Control	20	32.55±5.43	32.10±10.42	-0.45	2.01	0.411

For data analysis, the multivariate covariance was used. Therefore, the Levene’s test and Box test were performed and then, the assumption of homogeneity of regression slope was checked. Based on Box test, that was not significant for any of the variables, the condition of homogeneity of variance-covariance matrices correctly observed (BOX=8.41, F=3.24, and p=0.71). The Levene’s test for equality of variances showed that the scores of all studied variables between the two groups have no statistically significant difference (F=2.77,

2.11 & 2.32, and p>0.05). Thus, the condition of variance equality between groups is respected. Homogeneity study showed that the interaction between the groups and pretest is not significant (F=2.83 and p=0.71). Therefore, the data supported the homogeneity regression slopes. The analysis of regression chart conformed linear relationship between covariate random variables and the dependent variable. The normality of scores distribution for studied variables was assessed by Shapiro Wilks test.

**Table 3** The normality of distribution of studied variables scores

		Experimental group		Control group	
		Statistic	Sig.*	Statistic	Sig.*
General well-being	Pretest	0.732	0.611	0.799	0.733
	Posttest	0.711	0.678	0.765	0.721
Psychological well-being	Pretest	0.646	0.701	0.712	0.711
	Posttest	0.622	0.833	0.699	0.834
Psychological distress	Pretest	0.696	0.711	0.678	0.712
	Posttest	0.611	0.810	0.633	0.698

\*Shapiro Wilks test

As shown in Table 3, the values of Shapiro Wilks test for studied variables are not significant in any of the pretest and posttest stages in the experimental and control groups (p>0.05). Therefore, the distribution of scores is normal in the studied variables.

The multivariate covariance analysis was employed to investigate the effect of puberty training on general well being and its dimensions because the significant levels allowed the use of multivariate covariance analysis. The results showed that there is significant differences between the experimental and control groups concerning at least one of the dependent

variables (Wilks Lambda=0.46, F=13.09, p<0.01). Then, the univariate covariance analysis was performed. The results on general well being and its dimensions are presented in Table 4.

According to Table 4, there is significant differences between the experimental and control groups in terms of posttest scores of general well being, psychological well being, and psychological distress (p<0.05). As a result, it can be said that puberty training increased general and psychological well being and reduced psychological distress. In addition, the effect of puberty training was

about 17%, 24%, and 22% for the variables of general well being, psychological well being, and psychological distress; respectively

( $p < 0.05$ ). Observed powers of 0.73, 0.89, and 0.87 showed that sample size was sufficient for this research.

**Table 4** *Univariate analysis results*

Dependent variable	df	Mean square	F	Sig.	Partial eta squared	Observed power
General well being	1	136.79	6.92	0.013	0.17	0.73
Psychological well being	1	225.91	10.97	0.002	0.24	0.89
Psychological distress	1	413.5	10.08	0.003	0.22	0.87

## Discussions

The results of the present study showed that training puberty issues to the first grade high school girls can increase their psychological well being. It also decreased psychological distress in female students.

The results of the present study is in accordance with those of other studies conducted on the efficacy of training puberty in reducing mental health problems, including a study performed by Aghayousefi et al. [19] who investigated the effect of puberty and menstrual hygiene training on mental health of girls and concluded that mental health improved after training. In addition, Karamati et al. [23] examined the effect of puberty hygiene training on knowledge, attitude, and general mental health of adolescents and showed that training can enhance mental health of adolescents. Furthermore, the results of this study are consistent with the results of Heinicke et al. [17] and Cousinau [18], in which the effectiveness of puberty training programs was reported on decreasing depression, body dissatisfaction, and eating disorders as well as increasing self-esteem and body esteem.

The topic of puberty development is a basic teaching element in many sex education programs [24]. A meta-analysis on the effectiveness of school-based programs in sex education from 1960 to 1997 concluded that, in general, these programs have a positive effect on overall knowledge about puberty and sexuality. Knowledge about bodily changes during puberty is important not only for the psychosocial adjustment of young adolescents, but also for self-esteem, body-esteem, and

initiation of safer sex behaviors [25].

There are complex biological, psychological, and sociological reasons for why young people are so susceptible to mental illness [26]. The confusion and anxiety in adolescents during early puberty is due to the rapid physical changes coupled with their inability to adapt to these changes; this can cause sudden changes in their behavior and reactions towards people in their environment [27]. During puberty, girls' bodies become more curved and attain greater body mass; whereas, boys' bodies become larger and more muscular. Girls respond negatively to this increase in curviness and body mass, because girls are socialized to focus upon their appearance with thinness as an ideal. The ideal thinness is indoctrinated by both the media and peers. For instance, women's and teenage girls' magazines and advertisements emphasize thinness as an obtainable goal that will bring happiness. The result is that adolescent girls develop negative body images that result in poor psychosocial adjustment, including depression; whereas, adolescent boys' body images and psychosocial adjustment both become more positive compared to childhood [11].

Poor understanding of puberty changes puts girls in a position where their continued ignorance makes them more susceptible to developing feelings of fear, shame, and confusion about their reproductive functions, negative menstrual attitudes, and low self-esteem. Additionally, girls who are unknowledgeable about menstruation are

also more likely to get information from their friends who may provide wrong information because of lack of experience. Adolescents' lack of formal training about puberty, lack of parent's enough knowledge about puberty, discomfort of some families during discussing about puberty, and taboo of sex education in Iran, all are the issues making adolescents to not be familiar with puberty changes and hence experience a considerable distress. Discussion about puberty changes and related issues in a formal place like school provide reliable and proper information for students and also about the problems. Puberty training reduces negative feelings such as fear, shame, confusion, and embarrassment and can create positive attitudes towards the normal changes of puberty.

Limitations of this study included sensitivity to puberty and sex matters, education officials worried about the content of the curriculum, long term intervention and interference of program with official curriculum. There are several directions in which future research should proceed. In addition to extended sampling, it is necessary to design such programs for boy adolescents. Educating young adolescents and pre-teens about their changing bodies is recommended. Moreover, with the increasing use of technology by children and adolescents, use of computer technology to deliver this education may serve as an important effect. Social and cultural factors also play important role in girls' understanding of puberty. Therefore, it is important to pay more attention to culture and social status of participants.

### **Conclusion**

In summary, the findings of this study showed that training puberty matters to adolescent girls help them to obtain proper information and accept natural changes of puberty. Moreover, it can improve body image and diminish anxiety and confusion of girls and create a safety context for discussing problems that are confronted in adolescence. It is recommended to hold health courses in early puberty; it will help adolescents get to know their own bodies and

deal with the common problems during this period. These programs should be part of the formal education curriculum. The education in this regard should be comprehensive including physical and psychological changes of puberty. Students also should be informed on matters of puberty according to their age and needs gradually, comprehensively, and through appropriate sources.

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Study design: SM, AE, AB, ES

Data collection and analysis: SM

Manuscript preparation: SM, AE

### **Conflict of Interest**

"The authors declare that they have no competing interests."

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