

Research Article

The Role of Adolescence Stages and Physical puberty on Mental Health and Hope in an Iranian Sample

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Abstract

Objective: The purpose of this study was to examine the relationships between physical puberty, mental health and hope and to investigate the role of adolescence stages and physical puberty in relation to gender and ethnicity in an Iranian sample.

Method: Participants included 300 adolescents that were randomly selected within a survey design from Eghlid, Iran. A demographic sheet and three self-rating measures were used in the present inquiry.

Results: Findings indicate (a) a significant positive relationship between physical puberty and the anxiety/insomnia subscale of mental health (b) a significant negative relationship between physical puberty and the somatization and depression subscales of mental health, and (c) a significant positive relationship between physical puberty and hope (specifically the pathways and agency subscales of hope). Early stage adolescents had significantly higher levels of somatization and anxiety/insomnia than middle and late stage adolescents. The early and mid-stage adolescents' showed a greater level of psychopathology than late stage adolescents. Individuals in the early physical puberty phase had significantly higher levels of anxiety/insomnia and depression than adolescents in the middle and post-physical phases of puberty. Adolescents in early physical puberty had significantly higher performances on the pathways and agency subscales of hope, and the total hope scale than individuals in the mid and post-physical puberty phases. The roles of gender and ethnicity were not significant in relation to their influence on mental health and hope in this study.

Conclusions: This study demonstrates the relationships between physical puberty, mental health and hope, and the role of adolescence stages and the types of physical puberty on these constructs. Further studies should examine the roles of cultural contexts on these constructs in cross-cultural studies.

Keywords: Adolescence; Physical puberty; Mental health; Hope; Demographics

Introduction

Adolescence could be a particularly turbulent as well as a dynamic stage of one's life [1]. The adolescence stage is classified into three distinct phases in developmental psychology: early, mid, and late adolescence. These distinct stages of adolescence are mediated by the concurrent phase of physical puberty. Physical puberty in adolescence is classified into three types: early, mid, and post-physical puberty [2]. The adolescence stages in relation to the phase of physical puberty being experienced are important factors in the psychological adaptation of adolescents. These factors can play significant roles in an adolescent's vulnerability to several mental disorders and risk-taking behaviors [2-4]. Therefore, the purpose of this study is to examine the relationship between physical puberty and both mental health and hope; to investigate the roles of adolescence stages and types of physical puberty with regards to the possible influences of gender and ethnicity on these constructs in an Iranian sample.

Adolescence Stages and Mental Health

Patel and colleagues [5] indicated that mental disorders can account for a large proportion of the disease burden in adolescence in all societies. Plancherel and Bolognini [6] showed that mental health in early adolescence, i.e. 12 -14 years-olds, seems to be relatively stable, whilst Patel and colleagues [5] showed that poor mental health in adolescents is strongly related to other physical health problems. A help-seeking model in mental health [7] indicates that there are different pathways for the occurrence of mental health among adolescents in Iranian culture. For instance, Emami and colleagues [8] showed that the 18-year-old adolescents have a higher ratio of mental health problems in relation to 17-year-old adolescents in an Iranian sample. Haghighi and colleagues [9] indicated that more than half of Iranian adolescents suffer with some form of mental disorder; with the frequency of mental illness amongst girls is higher than that of boys. Mohammadi and colleagues [10] reported a relatively high prevalence of psychiatric disorders in Iranian adolescents. In general, the analysis of existing literature indicates a lack of information with regards to the possible role of adolescence stages on mental health, particularly in Iranian culture. It is essential to investigate this for the implementation of mental programs.

Types of Physical Puberty and Mental Health

Physical puberty takes on average 3 years to occur in boys, but it may range from 2 to 5 years, whereas physical puberty in girls takes an average of 4 years but may range from 1.5 to 8 years [11]. Puberty status is still determined by Sharia laws in Iranian society. Supplement 1 of article 1210 of the Civil Code states: "Age of puberty for a boy is at 15 full lunar years and for a girl is at nine full lunar years". Research has indicated that the physical puberty phase can influence mental heath in adolescence among both genders [12-14). Angold and colleagues [15] indicated that girls have an increased risk for mental disorders (such as depression) in their mid-physical puberty phase. However, several studies found that physical puberty is a problematic issue for the development of psychopathology in both genders [13,16-18]. Mohammadzadeh and colleagues [19] reported that teenagers have insufficient information about physical puberty phases in Iranian society; they may experience emotional problems because of physical puberty occurrence, (particularly in girls); there is a a lack of health education in this field. Ahmadi and colleagues [20] indicated that anxiety is a common feature of physical puberty in Iranian adolescents. The aforementioned research studies indicate that there is a necessity to investigate further, particularly with regards to the possible role of physical puberty on mental health in the country.

Adolescence, Physical Puberty and Hope

Snyder and colleagues [21] defined hope as "a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)" (p.287). Snyder [22] found that an individual with low levels of hopefulness usually remains stuck when they encounter a goal obstacle. According to the current conceptualization in hope theory, it seems that individuals who maintain high levels of hopefulness are those who will appraise a situation as challenging and overcome goal obstacles (?) [23]. Studies indicate that hope can enable individuals to handle situations better particularly when they are facing events, such as developmental stressors. It is therefore indicated that with hope they can achieve a sense of well-being [24,25]. Mashunkashey-Shadlow [26] suggested that hope remains stable over a 3-year time period in adolescents and Fortman [27] verified that hope is unstable in late adolescence but facilitating of hope can increase academic achievement in adolescents. Therefore levels of hopefulness may be more stable in the early and middle stages of adolescence. Farokhzad [28] indicated that girls have a significantly higher level of hope than boys, which needs to be ascertained further, in relation to findings that girls are at higher risk for mental health problems in the mid-puberty phase. Bolland [29] argued that adolescents react to their ambiguity and uncertain situations by abandoning of hope; and this process can guide them to adopt high levels of risk behaviors. Similarly, Adolescents with high levels of hopefulness were purported to have less occurrences of different types of mental disorders than adolescents with low levels of hope [30,31]. The reviewed literature indicates the need to investigate the possible influence of physical puberty phases on levels of hopefulness with regards to the possible mediating effects of gender and ethnicity, particularly in Iranian culture.

The Present Study

This study suggests that physical puberty development has a potential role in mental health and hopefulness in adolescents. It is further speculated that adolescence stages and physical puberty phases have potential roles in mental health and hopefulness with regards to the mediating effects of gender and ethnicity. This study predicts that adolescents who attain puberty at the appropriate adolescent stage may experience a sense of wellbeing and good mental health [32]. Theoretically, this study is founded on a developmental psychopathology model which was posited by Cicchetti and Rogosch [33]. This theory provides an integrative framework for understanding the potential role of physical puberty phases in mental health and hope in adolescence. The developmental theory of psychopathology has several dimensions which explain the role of physical puberty with regards to gender and ethnicity in both mental health and hope in adolescents [33-35] and forms part of the theoretical foundation of this study. The present study suggests a significant relationship between physical puberty, mental health and hope in adolescents. It is further posited in this study that adolescence stages and phases of physical puberty may have significant roles in mental health and hope with regards to the mediating effects of gender and ethnicity. The first hypothesis is that physical puberty development, mental health and hope would have significant correlations in this sample. The second

hypothesis of this study is that adolescence stages and phases of physical puberty in relation to gender and ethnicity would have significant effects on mental health and hope amongst this sample.

Method

Participants

Participants were 300 adolescents (M=150 and F=150) from Eghlid city, Fars province, Iran. The mean (and standard deviation) of age for total sample, females and males were 14.50 (2.02), 14.56 (2.09) and 14.44 (1.97) respectively. This sample included Fars (N=100), Lour (N=100) and Turk (N=100) ethnics, of whom all were Muslim. Participants were selected from all parts of the city, using a systematic random sampling method. For this purpose, the city was divided into four geographical regions, then two streets in each area were randomly selected, in which two lines in each street were selected at random. From this, houses were selected at 10-house intervals until 20 participants per line were selected. This procedure was replicated for the total sample and none of the adolescent participants were chosen from the same house. A total of 20 participants' data were removed due to invalid responses to measures. Of the 300 participants remaining in the data pool, 118 were early adolescents (11 through 13 years of age), 112 were middle adolescents (14 through 16 years of age), and 70 were late adolescents (17 through 19 years of age). In this study, participants were classified into the three groups: early-physical puberty (N=173), mid-physical puberty (N=100), and post-physical puberty, (N=27) groups based on the Pubertal Development Scale [36]. The physical puberty cut off points were determined by taking the average pubertal development for age, then below average was early and above average was late.

Instruments

The demographic questionnaire included items on age, gender, ethnicity, parents' job and education, and the participant's level of education. The three inventories used were: (1) the Pubertal Development Scale (PDS), (2) the General Health Questionnaire-28 (GHQ-28), and (3) the Children Hope Scale (CHS).

The Pubertal Development Scale (PDS): The PDS has two forms for girls and boys, and both forms contain questions about changes that may be happening to their body. The PDS is a self-administered rating scale and an adaptation of an interview-based physical puberty-rating scale by Petersen and colleagues [37]. The PDS is a 5-items scale for physical puberty development in girls and boys. The PDS included scores for each of five items rating physical development, an overall maturation measure, and a categorical maturation score designed to be similar to Tanner staging categories [36]. Boys and girls were asked questions regarding growth spurt, growth of body hair, and changes in skin or pimples. In addition, boys reported status of voice deepening and facial hair, and girls reported status on breast growth and onset of menses. Bond and colleagues [38] showed that the PDS is a valid and reliable measure for assessment of the pubertal status in epidemiological studies. Authors translated and validated the PDS to the Persian language for both genders in this study. The construct validity of the PSD for girls and boys were affirmed by a few faculty members in the field of pediatrics, psychiatry and clinical psychology. Reliability of the PDS for females and males was determined by using Cronbach's alpha, which in the present study was .92 and .90 respectively.

General Health Questionnaire-28 (GHQ-28): The GHQ-28 consists of 28-items, which assesses somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. The GHQ focuses on the client's ability to carry out "normal" functions and the appearance of any new disturbing phenomena. The GHQ-28 scores range from 0 to 28 using the Likert scale. The GHQ-28 has been extensively used and validated in different settings and different cultures [39-41]. Research indicated that the four factors which are the basics in this questionnaire have a high internal consistency in Iranian culture [42]. The reliability of the GHQ-28, somatization, anxiety/insomnia, social dysfunction and depression subscales were assessed using Cronbach's alpha internal consistency and in the present study was found to be . 88, .89, .84, .92 and .90 respectively.

Children Hope Scale (CHS): The CHS is a 6-item self-report questionnaire assessing children's dispositional hope. The CHS is "based on the premise that children are goal directed and that their goal-related thoughts can be understood according to two components: agency and pathways" [43]. These two components, agency and pathways are assessed by the measure. The CHS measures the hope of 8-19 year old children [44]. Answers on this scale range from "None of the time" to "All of the time" on a six-point Likert scale. Three of the six items can be summed to form a "Pathways" subscale and the other three sums to form an "Agency" subscale agency. The CHS was developed for use with children ages 7 to 16, and support for reliability and validity, as well as factor structure, has been established in many different populations of adolescents [45]. Authors translated and validated the CHS to the Persian language in this study. The concurrent validity of the CHS in the present study was examined in relation to the Students' Life Satisfaction Scale [46] A .38. Reliability of the CHS was determined by using Cronbach's alpha, which in the present study was .90.

Procedure

Upon arrival at the houses of all participants and after an initial presentation the participants' informed consent was acquired, and then they completed a questionnaire containing sections on background information and three inventories. All participants were tested in an individual setting in their houses by the same-sex research assistant. Assistants of data collection in this study were graduate psychology students. All tests were administered in the Persian language.

Participants were granted counseling services as an incentive upon their request to participate in the study. The forms and types of free counseling services were determined by the demand of the respondents for various psychological problems for themselves or their families.

Results

To examine the first hypothesis the Pearson correlation coefficient was conducted to evaluate relationships between physical puberty, mental health and hope in this sample. The descriptive statistics for these variables are presented in Table 1. Moreover, a p value of less than .05 was used as an indicator for significance in this study. The score of physical puberty development was calculated without its categorization in this analysis. This was computed among the 9 variables in an effort to assess the degree that physical puberty was negative, positive and linearly related to psychopathology and hope in this sample. Physical puberty had a significant positive relationship to the anxiety/insomnia; r(299)= .307, p<.01, subscale of mental health; significant negative relationship to the somatization; r(299)= -.191, p<. 01, and depression; r(299)= -.211, p<.01, subscales of mental health and; a significant positive relationship to hope; r(299)= .474, p<.01, and pathways; r(299)= s.415, p<.01, and agency; r(299)= .427, p<.01, subscales of hope (Table 2).

The second hypothesis of this research study examined the effects of adolescence stages, phases of physical puberty, gender, and ethnicity as independent variables on mental health and hope (dependent variables). To investigate the possible differences for independent variables in the second hypothesis, a multivariate analysis of variance (MANOVA) was conducted by adolescence stages, phases of physical puberty, gender, and ethnicity and their interactions as independent variables with mental health and hope as dependent variables. An overall multivariate effect found for adolescence stages (Wilks' k= .896; F(14,498)= 2.96; p<.01, Eta= .05), and the types of physical puberty (Wilks' k= .766; F(14,498)= 5.08; p<.0001, Eta= .12) in dependent variables. This analysis indicated no significant effects of gender (Wilks' k= .956; F (14, 498)= .803; p<.66), and ethnicity (Wilks' k= .956; F (14,498)= .845, p<.61) on mental health and hope. Also, this analysis rejected the interactive effects for all independent on dependent variables in this sample.

	Variables	Minimum	Maximum	м	SD
Puberty	Physical puberty	0	15	10.12	2.94
Mental Health	Somatization	2	29	6.38	2.76
	Anxiety/Insomnia	0	29	6.87	3.63
	Social Dysfunction	1	51	17.55	3.65
	Depression	0	14	1.84	2.14
	GHQ-28	21	60	32.66	5.44
Норе	Pathways	2	9	6.58	1.28
	Agency	2	9	6.25	1.33

CHS	5	18	12.84	2.32
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 Table 1: Descriptive Statistics of Physical Puberty Development, Mental Health and Hope in the Total Sample GHQ-28= General Health Questionnaire-28, CHS= Children Hope Scale.

Variables	Somatization	Anxiety/ Insomnia	Social Dysfunction	Depression	GHQ-28	Pathways	Agency	СНЅ
Physical Puberty Development	191**	.307**	036	211**	.003	.415**	.427**	.474**
Somatization		.175**	190**	.152**	.554**	204**	063	149**
Anxiety/Insomnia			256**	048	.566**	.207**	.325**	.301**
Social Dysfunction				.196**	.327**	.002	045	025
Depression					.306**	182**	237**	236**
GHQ-28						033	.064	.018
Pathways							.579**	.884**
Agency								.893**

Table 2: Physical Puberty Development, Mental Health and Hope Correlations Coefficients in the Total Sample $*p \le 0.05$, $**p \le 0.01$ GHQ-28=General Health Questionnaire-28, CHS= Children Hope Scale.

Independents	Stages of Adolescence							
	Early		Middle		Late		F	Р
	М	SD	м	SD	м	SD		
Somatization	7.28	3.48	5.88	2.01	5.65	1.89	3.57	.030
Anxiety/insomnia	7.68	4.12	7.66	2.96	4.24	2.29	6.96	.001
Social dysfunction	17.88	4.64	17.82	2.67	16.55	2.93	2.09	.12
Depression	2.08	2.45	1.59	1.70	1.82	2.18	.01	.99
GHQ-28	34.94	6.62	32.99	2.90	28.28	3.45	9.18	.0001
Pathways	6.42	1.29	6.87	1.27	6.40	1.20	.32	.72
Agency	6.24	1.29	6.56	1.19	5.77	1.47	.29	.74
CHS	12.66	2.30	13.43	2.18	12.17	2.38	.21	.80

 Table 3: Tests of Between Subjects Effects for Adolescence Stages in Mental Health and Hope GHQ-28= General Health Questionnaire-28, CHS=

 Children Hope Scale

In the field of mental health, tests of between subjects effects for adolescence stages showed significant differences on somatization, F (2,297)=3.57, p<.03, anxiety/insomnia, F (2,297)=6.96, p<.001, and the GHQ-28, F (2,297)=9.18, p<.0001, dependent variables. However, tests of between subjects' effects for adolescence stages did not show significant differences on hope and its subscales [Table 3]. Additionally, tests of between subjects effects for types of physical puberty as an

independent variable showed significant differences on anxiety/ insomnia, F (2,297)= 5.68, p<.004, and depression, F (2,297)= 3.40, p<. 03, subscales of mental health in this sample. Tests of between subjects effects for types of physical puberty as an independent variable showed significant differences on pathways, F (2,297)= 17.22, p<.0001, and agency, F (2,297)= 20.43, p<.0001, subscales of hope and the total hope score, F (2, 297)= 25.74, p<.0001, as dependent variables [Table 4].

Independents

Types of Physical Puberty

	Early		Middle		Late		F	Р
	м	SD	м	SD	м	SD		
Somatization	6.89	3.13	5.62	1.76	5.92	2.57	2.505	.08
Anxiety/insomnia	5.89	3.99	8.37	2.70	1.88	.36	5.68	.004
Social dysfunction	4.01	.30	3.21	.32	2.43	.46	.97	.37
Depression	2.52	.19	1.28	.12	1.17	.22	3.40	.03
GHQ-28	6.60	.50	3.40	.34	2.72	.52	.58	.56
Pathways	1.33	.10	.80	.08	1.03	.19	17.22	.0001
Agency	1.40	.10	.87	.08	.90	.17	20.43	.0001
CHS	2.43	.18	1.25	.12	1.62	.31	25.74	.0001

 Table 4: Tests of Between Subjects Effects for Types of Physical Puberty in Mental Health and Hope Notes: GHQ-28= General Health Questionnaire-28, CHS= Children Hope Scale.

Discussion

The results from the first hypothesis indicated that physical puberty had a significantly positive relationship to the anxiety/insomnia subscale of mental health; physical puberty had significant negative relationships to the somatization and depression subscales of mental health and; physical puberty did not have significant relationships with the total scale of mental health and its social dysfunction subscale. In addition, physical puberty had a significant positive relationship to hope; and pathways and agency subscales of hope. The significant relationships between physical puberty, mental health and hope show the illustrative aspect of this study in an Iranian sample. These findings are congruent to studies that supported the role of pubertal development on psychological adaptation, mental health and the sense of positive emotions such as hopefulness in adolescents [2,14,47]. These findings are consistent with the literature that indicated the relationships of physical puberty, mental health and hope in adolescents [5-8,24,25,29-31]. As Geffken and colleagues noted already [48]; these findings show the positive correlation between hope and physical puberty which may decrease the occurrence of mental disorders and increase social support and adaptive strategies in adolescents. This explanation resembles the motivational aspect of the hope construct that was proposed by Menninger [49]. Similarly, Stotland [50] conceptualized that hope is a future-oriented strategy toward a desired goal. Therefore it is posited that hope involves a positive attitude toward a preferred outcome that is worth the effort for an individual in a given time and situation. According to Snyder [51], people with hopefulness can employ different, but highly related types of thinking for attainment of their aspirations which is called: pathways and agency. This study suggests that hopefulness can positively influence biological and psychosocial changes in adolescents and in turn increase their confidence thereby enabling them to have future goals. Somatization and depression (as two indices of mental health) can negatively influence bodily functions and physical complaints in adolescents; in turn these factors can decrease general energy and hopefulness with regards to the future. In contrast, the anxiety and insomnia subscale of mental health can stimulate some physical activities and imagination in adolescents which could result in higher aspirations and hope-related imagery.

Results from the second hypothesis in this study indicated the effects of adolescence stages on the somatization and anxiety/insomnia subscales of mental health and the total mental health scale. However, adolescence stages did not have significant effects on hope and its subscales. In addition, the MANOVA showed that early stage adolescents had significantly higher levels of somatization and anxiety/ insomnia than middle and late stage adolescents. However, early and middle stage adolescents had significantly higher anxiety/insomnia than late adolescents. It was found that both early and mid-stage adolescents have significantly higher psychopathology in comparison to late stage adolescents. There were no significant differences between early, middle and late stage adolescents on the depression and social dysfunction subscales of mental health; and hope and its subscales. These findings are congruent with prior literature that affirmed the role of adolescence stages on mental health and hope in adolescents [2-4,6,27,28,30,31]. However, the present findings are incongruent with a number of studies conducted on Iranian adolescents that revealed a higher level of psychopathology among the late stage adolescents [8,9]. Overall, the effect of adolescence stages on mental health and hope among adolescents in this study are congruent with the predictions of developmental psychopathology and hope theories [31-35]. This study suggests that as adolescents reach maturation in the late stage, they can enhance their competency for cognitive, emotional and social skills. These skills can help adolescents to engage more efficiently with adverse situations in their lives, and thereby it is plausible that late adolescents have a lower level of psychopathology than early and midstage adolescents.

Results from the second hypothesis indicated the effect of phases of physical puberty on anxiety/insomnia and depression subscales of mental health, and pathways and agency subscales of hope and the total hope scale. Therefore, individuals with early physical puberty had significantly higher levels of anxiety/insomnia and depression than adolescents undergoing middle or post-physical puberty. However, there were no significant differences between individuals with early, middle and post-physical puberty on the somatization and social dysfunction subscales of mental health and the total mental health score. Finally, adolescents undergoing early physical puberty had significantly higher performances in pathways and agency subscales of hope and total hope scale than individuals undergoing mid and postphysical puberty development. These findings are in line with investigations which demonstrated that a higher incidence of risky behaviors and mental disorders is related to changes of physical puberty in adolescents [3-6,10,12,14,18]. The severity and load of biological, psychological, social and cognitive changes in the early physical puberty phase are higher than same changes in the mid and post physical puberty phases. Therefore, it would be expected that psychopathological symptoms and hopefulness will change in the early, mid and post-physical puberty phases. Since adolescents are more fantastic and imaginative about their physique during pubertal development; individuals in the early and post-physical puberty phases often demonstrate a lowered ability for ego-strength and reality testing with regards to somatic changes and this mental imagery can influence their hopefulness. In agreement with Snyder and Forsyth [52] this type of hope is more illusionary and its presence depends on a lowered level of consciousness and self-awareness in the first phase of physical puberty. In line with Dorn and colleagues [53], this study showed that an adolescents' self-rating about their physical pubertal phase is a proficient method for understanding mental disorders and positive outlooks. However, to understand the differences in mental health and hope among the early, middle and post-physical puberty phases in adolescence, and its continuity across to adulthood, longitudinal studies in the future are required. This study suggests that the early physical puberty phase can increase the incidence of anxiety/insomnia and depression in adolescents. Also, this study suggests that the early physical puberty phase may increase hope as a fantastic strategy for the solving of physical and interpersonal complaints in adolescents.

In conclusion, the present study adds to growing body of literature on physical puberty, mental health and hope interconnections, and to the understanding of the roles of adolescence stages and phases of physical puberty on the aforesaid constructs in an Iranian sample. However, the present study is limited due to its reliance on the survey method and self-rating measures. Forthcoming investigations can apply experimental designs, particularly laboratory controlled anatomical measures of physical puberty. Upcoming studies could examine the roles of cultural contexts on mental health and hope constructs in cross-cultural studies in both clinical and non-clinical samples. Indeed, it is put forward that phases of physical puberty and adolescence stages and their roles on mental disorders in different cultural contexts needs to be take into consideration in further inquiries.

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