

# Psychological Outcomes of Early Puberty among Adolescent Girls

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## ABSTRACT

**Aim of the Study:** The current research was conducted to explore the psychological outcomes of early puberty among adolescent girls.

**Methodology:** Researchers followed cross-sectional research design and random sampling technique in our research. Participants (N=204) were approached from six different grades (i.e. from grade 5-10) and two different schooling systems (i.e. public sector and private sector). Age of the participants was 11-16 years. We administered Urdu versions of Aggression Questionnaire (Buss & Perry 1992), Menstrual Distress Questionnaire (MDQ; Moos, 1968), and Depression Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995) along with detailed demographic sheet.

**Findings:** Results of *Pearson Product Moment correlation* showed that MDQ had a significant negative correlation with internalizing psychological problems ( $r = -.161, p < .05$ ), however it was positively correlated with externalizing ( $r = .228^{**}, p < .01$ ). *Regression analysis* revealed that two of the subscales of MDQ i.e. *Negative Affect* and *Water Retention* significantly predicted DASS in subsequent steps, whereas MDQ total, *Water Retention* and *Autonomic Reaction* significantly predicted Aggression among participants. Group comparison for pubertal onset on independent sample *t*-test revealed a significant mean difference on *Negative Affect* and *Arousal* subscales of MDQ and on *Depression* subscale of DASS. Results of ANOVA revealed that the girls with the feelings of ambivalence and detachment for their fathers had more severe problems of MDQ depicted in the subscales of *Concentration*, *Pain* and *Arousal* than those who were securely attached with fathers.

**Implications:** These results offer significant evidence regarding possible high-risk behaviors among girls and support future intervention possibilities.

**Keywords:** Menstrual Distress, Adolescents, Early puberty, Negative Affect, Water Retention, Arousal.

## Article History

Received:  
April 13, 2023

Revised:  
June 17, 2023

Accepted:  
June 22, 2023

Published:  
June 25, 2023

## Introduction

Puberty is a time of evolution due to an extended developmental field. It pertains many individual differences not only in biological expression of maturity but also in the psychological correlates of it (Mendle & Ferrero, 2012). These biological and psychological correlates of puberty are the important predictors for either individual well-being or psychopathologies during adolescence and even in adulthood. Experience of puberty and its relationship with behaviors and pathologies vary across genders (Liu, 2018). However, among girls, an earlier puberty as compared to their peers is considered as one of the important risk factors for a wide-ranging internalizing (i.e., depression, disordered eating, anxiety and poor academic performance) and externalizing (e.g. anger, irritation) psychological outcomes (Graber et al., 1997, Mendle & Ferrero, 2012). Therefore, in the current study we focused on adolescent girls' internalizing and externalizing psychological outcomes during the pubertal transitions. Although puberty accompanies social and emotional challenges for all girls, individual differences in maturation play a key role (Mendle et al., 2007).

Following puberty, adolescent girls especially those who are early maturers experience several internalizing and externalizing psychological outcomes. Internalizing problems are comprised of symptoms that the individuals experience by themselves such as sadness, anxiety and loneliness (Mrug et al., 2014; Esther, et al., 2021). Bansal et al. (2009) stated that the most prominent internalizing symptoms are depression, anxiety, and somatic complaints, which prevails across adolescence, particularly among girls. Angold et al. (2002) claimed that during adolescent 20% of girls and 7% boys display many of the internalizing psychological problems.

On the other hand, Someone who engages in externalizing behaviors such as, aggression, delinquency, classroom disruptions and social deviance tend to harm others and violate social norms (Graber, 2013; Mendle & Ferrero, 2012; Rudolph, 2014). Externalizing behaviors generally increase after puberty starts (Hayward & Solomon, 2002; Ruiz-Hernández et al., 2019), however pubertal timing had a significant role in both intensity and rate of symptoms. Existing literature claimed that early maturing boys usually display exaggerated levels of externalizing problems throughout puberty and early adolescence, including conduct disorder, hostility, aggression, and risk-taking behaviors (Ge et al., 2006, Halpern et al., 2007) as compared to their female counterparts. However, some of the general externalizing problems such as aggression (both verbal and physical), impulsivity and hyperactivity are common among both of the genders (Levesque, 2011).

Several factors contribute for the early puberty and associated behavioral symptoms among girls including nutrition, father absence, broken families, stressful family environment, weight gain (Kaplowitz, 2008; Tither & Ellis, 2008) and disadvantaged neighborhood (Ge et al., 2002). The maturational deviance hypothesis proposed that early-maturing girls and late-maturing boys will experience the most adjustment difficulties (Boxer et al., 1980). Among both of the genders deviation from normal patterns of development bring behavioral and emotional problems and may lead towards psychopathologies. Similarly, the developmental readiness hypothesis also suggests that early-maturing girls will be at the highest risk for mood and behavior problems (Ge et al., 2002). Both of the theories commonly explain prospects for pubertal timing for both boys and girls; however, the underlying mechanisms based on several psychosocial and demographic factors.

## Review of Literature

Bigambo et al., (2023) explored the social and environmental risk factors for early puberty among adolescents. They took N=201 girls and N=24 boys who reported early pubertal signs and secondary sex characteristics, they also took 201 matched controls for girls and 96 boys for the sake of comparison. They concluded that environmental factors such as second hand smoking, filthy neighborhoods, BMI of mother, father's height, educated parents, sleep quality and sleep time were associated with early puberty among adolescent especially among girls. They also highlighted some risk factors among the environment

such as secondhand smoke and filthy surroundings and some protective factors such as sleep quality, sleep duration and parental education.

Sundari et al., (2022) studied the social and psychological factors relating to menstruation among adolescent girls. N=60 students with the age range of 13-16 years from a suburban school, who had experience menarche had been taken as participants for their study. They opted cross sectional research design and descriptive statistics were used for the analysis of data. They concluded that most of the girls who experienced menarche were belonged to the age range of 14-15 years and were in 9<sup>th</sup> grade. Most of the girls used to discuss their menstrual related problems with mothers, some with friends and a very slight proportion of introverted girls didn't discussed them with anybody. Majority of the participants reported sleep disturbance, cramps, pre-menstrual syndrome, and leg pain. Almost 70 % of the participants reported psychological problems associated with menarche such as mood swings, irritability, impulsivity, and restlessness. Majority of the girls reported that they did not have any idea regarding this huge transition before the onset of menarche, which was the harbinger of most of the psychological issues. They finally emphasized the importance of proper education regarding pubertal change to overcome most of the above-said issues.

### ***Rationale***

The present research was conducted to explore the psychological outcomes and pubertal age of adolescent girls. Puberty is time period when individual pass through many physical as well as psychological challenges; this is the transition phase for them. This research highlights the major psychological problem that early adolescent girls face due to their early pubertal age. Further, we examined the internalizing and externalizing psychological problem of early puberty among adolescent girls. Adolescent issues related to puberty like the one stress, aggression, depression sexual activity and other aspect of psychological issues was discussed in detail. This study revealed the psychological issues that occurred due to early puberty and affect the multiple domains (psychological, emotional, behavioral) of early adolescent girls and highlights the problematic behavior patterns that may be further leads to psychopathology. The study is valuable in deciding intervention plans for the population of same age and gender suffering from adjustment issues or psychopathologies due to pubertal transition.

### ***Study Objectives***

Researchers conducted the study to meet the following objectives:

- To explore the relationship among pubertal age, menstrual distress and psychological outcomes and among adolescent girls.
- To find out the predicting role of early puberty in internalizing and externalizing psychological problems among adolescent girls.
- To find out the difference on study variables between the groups based on the age of pubertal onset.

### ***Hypotheses***

Based on existing literature and theories, we formulated the following hypotheses

- There would be a significant correlation among pubertal age, menstrual distress and internalizing and externalizing psychological symptoms.
- Early puberty would be a significant predictor of internalizing and externalizing psychological problems among adolescent girls.
- There would be a significant difference on menstrual distress, internalizing and externalizing symptoms between both of the groups based on age of pubertal onset.

## Methodology

### Participants

We followed cross-sectional research design and random sampling technique in our research. Adolescent girls (N=204) were taken as participants from six different grades (i.e. from grade 5-10) and two different schooling systems (i.e. public sector and private sector). We randomly select equal proportion (n=34) of participants from each grade, where half of the participants from each grade were approached from public sector and half were from private sector (n=17 each). Age of the participants was 11-16 years corresponding the above-mentioned grades respectively. Adolescent girls experiencing amenorrhea, having history of any chronic biological illness or medication use, and diagnosed with any psychological disabilities were not included as participants. The adolescent girls from elite class school and from Madrassa were not the participant of the current study.

### Measures

**Demographic Measures:** Demographic information was collected through a questionnaire which carry the questions regarding family background, mother age, father age, monthly income, education, present age, age at onset of puberty, height, weight, birth order and changes experienced during menstruation as in appetite, energy level, sleep, and activity level.

**Buss and Perry Aggression Questionnaire (Buss & Perry, 1992):** Buss and Perry aggression questionnaire was used which consists on 29 items on five point rating scale from extremely uncharacteristic of me to extremely characteristic of me. The scale was further divided into four subclasses, i.e. "Physical aggression; Verbal aggression, Anger and Hostility. In the current study, Urdu translated version by Iftikhar and Malik (2014) was used.

**Menstrual Distress Questionnaire (MDQ; Moos, 1968):** Detailed pubertal effects were measured by using the *Menstrual Distress Questionnaire* (MDQ; Moos 1968). For the use of the scale in our study, we translated the scale with forward and backward translation method. However, factor structure of the scale had yet not determined due to time constraints. This is a 47-item scale including eight subgroups of symptoms that are rated on a six-point scale ranging from not at all to partially disabling. The subgroups are pain, concentration, behavioral change, autonomic reactions, water retention, negative affect, arousal and control. In addition to the subscale scores, the total score for MDQ was also meaningful.

**Depression Anxiety and Stress Scale (DASS; Lovibond and Lovibond, 1995):** Lovibond and Lovibond (1995) originally developed the Depression Anxiety and Stress Scale (DASS) however for our study, we used translated version of it by Zafar and Khalily (2015) The DASS consists of 42 items that is helpful in evaluating the following three widespread subscales; Depression, Anxiety, and Stress. DASS-42 has good psychometric indices with an overall reliability co-efficient of 0.94. There is no cutoff score for it; however, DASS total score is also meaningful

### Procedure

The study was approved from Institutional Review Board and the Departmental Board of Studies. Permission of data collection was taken from school authorities. Consent forms were signed from the willing participants after telling them the purpose and procedure of the study. The questionnaires and demographic sheet were given to the participant for collecting personal information. Prior to data collection, the participants were educated about their rights. All the ethical considerations were followed including confidentiality, informed consent, right to withdraw at any step and debriefing about the results.

### Results

The following results were computed for existing data using SPSS-21. Pearson product moment correlation was figured out to check the relationship among variables of interest. Whereas to check the

predictive strength of various variables and for the comparison between subsequent groups we use multiple regression analysis *t*-test and one-way ANOVA respectively.

Table 1: *Demographic Characteristics of Participants (N=204)*

Variables	Groups	<i>f</i>	Percentage (%)
<b>Age</b>	Early Adolescent (11-13)	105	51.5 %
	Middle Adolescent (14-16)	99	48.5 %
<b>Schooling System</b>	Public Sector	102	50 %
	Private Sector	102	50 %
<b>Family System</b>	Nuclear	97	47.5%
	Joint	107	52.5 %
<b>Relationship with Father</b>	Securely attached	93	45.6 %
	Ambivalent	73	35.8 %
	Detached	38	18.6 %
<b>Relationship with Mother</b>	Securely attached	200	98.0 %
	Ambivalent	1	0.5 %
	Detached	3	1.5 %
<b>Age at menarche</b>	Early Adolescent (11-13)	110	53.9 %
	Middle Adolescent (14-16)	94	46.1 %

Table 1 indicated the demographic characteristics of sample including age of the participants, study sample, family system, relationship of participants with father and mother and age at menarche.

Table 2: *Intercorrelations among Study Variables (N=204)*

Variables	1	2	3
1. MDQ	-	-.161*	.239**
2. DASS	-	-	-.016
3. AGRQ	-	-	-
<i>M</i>	141.9	103.4	94.1
<i>SD</i>	15.8	8.1	8.1

Note. MDQ= Menstrual Distress Questionnaire; DASS= Depression Anxiety Stress Scale; AGRQ= Aggression Questionnaire; *M*=Mean; *SD*= Standard Deviation; \**p* < .05; \*\* *p* < .01.

Table 2 showed a significant negative correlation between the menstrual distress and depression anxiety and stress among the participants whereas the menstrual distress appeared to have a significant positive correlation with aggression.

Table 3: *Menstrual Distress as a Predictor of Internalizing and Externalizing Psychological Problems among adolescent girls (N=204)*

Predictors	Outcomes	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i>	<i>R</i> <sup>2</sup>
<b>Internalizing Problems</b>						
<b>Step I</b>						
MDNA	DASS	-.34	.135	-.179	.01	.032
<b>Step II</b>						
MDNA	DASS	-.32	.134	-.167	.01	.020
MDWR		-.481	.233	-.143	.04	
<b>Externalizing Problems</b>						
<b>Step I</b>						
MD	Aggression	.123	.035	.239	.001	.057
<b>Step II</b>						
MD	Aggression	.096	.036	.187	.009	.032

MDWR		.596	.225	.186	.009
<b>Step III</b>					
MD	Aggression	.077	.036	.149	.036
MDWR		.676	.223	.211	.003
MDAR		.620	.223	.189	.006

Note: Only significant results are reported in each step. Step I, MDNA= Menstrual Distress, Negative Affect,  $F=6.55$ ,  $df=199$ ; Step II, WR= Water Retention,  $F= 4.24$ ,  $df=198$ . Step I, MD= Menstrual Distress,  $F=12.12$ ,  $df=201$ ; Step II,  $F=7.03$ ,  $df=200$ ; Step III, AR=Autonomic Reaction,  $F=7.71$ ,  $df=199$ .

Result of multiple linear regression showed that menstrual distress predicted internalizing and externalizing psychological problems among adolescent girls. In step I Negative Affect significantly predicted internalizing psychological problems ( $\beta= -.179$ ,  $p=.01$ ) accounting for 3% of variance. In this step, all other subscales were excluded because of insignificant predictors. Whereas in step 2 Negative Affect ( $\beta= -.167$ ,  $p= .01$ ) and water retention ( $\beta=-.143$ ,  $p=.04$ ) accounting for 2% of variance are significant predictors of internalizing symptoms among adolescent girls. While in the case of externalizing problems, in step I, menstrual distress total predicted aggression ( $\beta= .23$ ,  $p=.001$ ) accounting for 5% of variance. However during step II Menstrual Distress ( $\beta= .187$ ,  $p=.009$ ) and Water Retention ( $\beta= .186$ ,  $p=.009$ ) predicted externalizing symptoms i.e. aggression accounting for 3% of variance. In step III, Menstrual Distress ( $\beta= .149$ ,  $p=.03$ ) , Water Retention (  $\beta= .211$  ,  $p=.003$ ) and Autonomic Arousal ( $\beta=.189$ ,  $p=.006$ ) predicted externalizing symptoms accounting for 3% of variance in the total sample.

Table 4: Independent Sample t-test Comparing Age at Menarche on Menstrual Distress and Internalizing Psychological Problems (N=204)

Variables	<i>M (SD)</i>		<i>df</i>	<i>t</i>	<i>p</i>
	Early Adolescence n=110 (11-13) years	Middle Adolescence n=94 (14-16) years			
<hr/>					
<b>Menstrual Distress Questionnaire</b>					
Negative Affect	25.78(4.3)	23.69(4.1)	194	1.8	.05
Arousal	17.80 (3.5)	16.95 (3.1)	194	1.7	.05
<b>Depression Anxiety Stress Scale</b>					
Depression	34.98 (3.7)	33.46 (3.5)	194	2.8	.006

Note: M=mean; SD= standard deviation; df= degree of freedom

Separate results on independent sample t-test are demonstrated in table 4. Table revealed a significant difference in the scores of Negative Affect on age at menarche between early adolescents (M= 25.78, SD=4.3) and middle adolescents (M=23.69, SD=4.1);  $t(194)1.8$ ,  $p=.05$ . It also showed a significant difference in Arousal between menarche onset during early adolescents (M= 17.80, SD=3.5) and middle adolescents (M=16.95, SD=3.1);  $t(194)1.7$ ,  $p=.05$ . Whereas table also depicted a significant difference on depression (one of the subscales of DASS) between menarche onset during early adolescents (M= 34.98, SD=3.7) and middle adolescents (M=33.46, SD=3.5);  $t(194)2.8$ ,  $p=.006$ .

Table 5: ANOVA for Menstrual Distress Questionnaire based on Relationship with Father (N = 204)

Group	DVS	SS	Df	MS	F	p
<b>Menstrual Distress Questionnaire</b>						
<b>Relationship with Father</b>	Menstrual Distress total	2137.2	2	1068.6	4.4	.013
	Concentration	147.7	2	73.8	3.11	.046
	Pain	86.0	2	43.0	3.5	.029

<b>Error</b>	Arousal	110.3	2	55.0	4.9	.008
	Menstrual Distress total	48377.4	200	241.8		
	Concentration	4739.2	200	23.69		
	Pain	2405.0	201	11.96		
	Arousal	2236.1	201	11.1		

Table 5 presents significant results compiled from ANOVAs computed for the main effects and interaction of groups based on paternal relationships and menstrual distress and all of its subtypes. Interaction effects was found significant for overall menstrual distress among adolescent girls, moreover significant main effect of relationship with father was found on the subscales of menstrual distress questionnaire i.e. concentration (forgetfulness, confusion, distractibility); pain (cramps, backaches and headaches) and arousal (excitement, impulsivity and bursts of energy).

Table 6: *Means and Standard Deviations across Groups on Variables with Significant Differences*

<b>Variables</b>	<b>Relationship with Father</b>		
	<b>Securely Attached (n=92) <i>M (SD)</i></b>	<b>Ambivalent (n=73) <i>M (SD)</i></b>	<b>Detached (n=38) <i>M (SD)</i></b>
Menstrual Distress Total	138.4 (15.1)	144.6 (16.8)	145.37 (13.9)
Concentration	30.0 (4.3)	31.12 (5.4)	32.26 (4.7)
Pain	19.6 (3.5)	20.9 (3.4)	20.7 (3.1)
Arousal	16.6 (3.5)	18.2 (2.9)	17.1 (3.4)

In table 6 Magnitude of age group differences was further analyzed using Tukey's Poc Hoc test. It showed that the adolescent girls who had ambivalent and detached feelings towards their fathers exhibited excessive menstrual distress, concentration issues, pain and arousal

## Discussion

The current study intended to explore the Psychological outcomes of early puberty among adolescent girls. It was observed that more than half of the participants reported that they experience menarche at 11-13 years of age. Demographic data from the participants also revealed that almost 45.6% of the adolescent girls were securely attached with their father; 35.8% had ambivalent feelings and 18.6 % were detached from their father. Kanwar (2021) concluded that insure and detached attachment with the parents was and harbinger of pubertal stress and early pubertal signs among adolescents. He further claimed that the adolescents who did not have supportive relationship with their parents experienced even more pronounced behavioral and social changes during pubertal development. Moreover, current data also revealed that almost all participants attached securely with the maternal figure. This reveals that relationship with father had the potential to have internal psychological impact on the internalizing and externalizing psychological problems during the pubertal transition.

Inter correlation among the variables through Pearson Product Moment Correlation were computed. The outcomes revealed that menstrual distress and internalizing problems were negatively correlated with each other. However there was a significant positive correlation of menstrual distress with externalizing psychological problems i.e. aggression. Menstrual distress was assessed on the eight subscales i.e. arousal, autonomic reactions, behavioral, concentration, control, negative affect, pain and water retention of menstrual distress questionnaire. Whereas, internalizing and externalizing problems were revealed through the depression, anxiety and stress subscales of DASS and verbal, physical, anger and hostility subscales of aggression questionnaire respectively. In the current study, the negative correlation between menstrual distress and internalizing psychological problems may be due to the fact that though pubertal transition and the menarche are associated with several stress responses but they did not have as much intense and frequent as explained by any diagnosis of depression, anxiety or stress. The findings go in line with Chen and Chen (2009) who reported that the more severe menstrual distress had been associated

with less active daily routine and school absentees of adolescents but there was no evidence for any significant internal psychological problem. Carter et al. (2011) reported that perceived pubertal timing and menstrual distress had a week significant relationship with externalizing behaviors i.e. verbal and physical aggression, anger, hostility and non-suicidal self-harm. These findings go in line with our results which showed that there was a week significant positive correlation between menstrual distress and externalizing behaviors.

Table 3 reported that, overall menstrual distress particularly water retention explained through skin disorders, swelling and weight gain were significant predictors of internalizing behaviors among adolescent girls. Whereas menstrual distress, water retention and autonomic arousal i.e. palpitation, nausea, vomiting and dizziness were explained as the major causal factors of externalizing behaviors such as impulsivity, verbal and physical aggression, hostility and non-suicidal self-harm causing 3% of variance. These findings are consistent with the outcomes of existing literature on as Liu et al. (2018) claimed that menstrual distress, pain associated with periods and irregular cycles were the causal factors of externalizing problems particularly non-suicidal self-harm. Discussing the findings of a meta-analytical review, Dimler and Natsuaki (2015) reported that early pubertal maturation and associated distress effected on externalizing behaviors by  $r = 0.180$ . Though the effect size was small but it was significant effect which has a concordance with the early pubertal maturation models; stating that pubertal distress at an early age is accompanying with higher levels of externalizing behaviors.

Results from *t-test* analysis (table 4) revealed the group who reported early menarche had experienced significantly high level of negative affect i.e. crying, loneliness and depression; and arousal i.e. impulsivity and orderliness. Moreover, among the internalizing psychological problems girls with early pubertal signs came out with more depressive symptoms. Findings from ANOVA table (5) revealed that various groups reporting different paternal relationships (relationship with father i.e. securely attached, ambivalent, and detached) exhibited significantly different results on menstrual distress questionnaire. Particularly all three groups vary on the total score on menstrual distress questionnaire. However, more specifically groups vary on concentration (showing distractibility and forgetfulness), pain (depicting through cramps, muscle pain and backache) and arousal (as exhibited by orderliness and excessive excitement). ANOVA results are further explained by Post-hoc analysis that revealed that in all the groups, girls who are securely attached with their fathers had less scores on concentration, pain and arousal than those of the girls who had ambivalent feelings or who were detached from their fathers. These above mentioned findings were consistent existing literature as Mendle et al. (2006) reported that girls with unrelated and detached males family members or paternal figures reached menarche at an earlier age and reported more distress than that of the girls with secure paternal figure in their homes. Culpin et al. (2014) had showed almost similar findings reporting that father absence in early years of life was associated with early menarche and increased psychosocial problems among adolescent girls.

## Conclusion

It was concluded from the current research that menstrual distress and externalizing psychological problems were directly correlated. Subscales of menstrual distress questionnaire – *Negative Affect*, *Water Retention* and *Autonomic Reaction*- predicted overall externalizing problems (more specifically aggressive behavior) among adolescent girls. Furthermore, girls who experienced early menarche more *Negative Affect*, *Arousal* and *Depression* as compared to those with late pubertal onset.

## Limitations and Recommendations

The study has certain limitations i.e. Due to time constraints; our study is cross sectional in nature. However, a longitudinal study with a larger sample size might be a more suitable option for this type of research with dynamic population. The use of foreign measurement tools (as its hard for them to discuss this sensitive issue in our cultural context despite the Urdu translated versions) had been a problem during data collection and off-course at the time of analysis. Despite all these limitations, the study provided valuable information regarding the association between menstrual distress and internalizing and



externalizing problems, which adolescents usually display. The findings might be helpful to deal with internalized and externalized behavioral problems of adolescent girls in the mainstream due to menarche or associated factors which were discussed in the study.

### Acknowledgments

None.


### Conflict of Interest


Authors declared no conflict of interest.


### Funding Source

The authors received no funding to conduct this study.

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