Research Article

Stress and Coping Strategies among Adolescent Girls Regarding Pubertal Changes: A Cross-Sectional Study in Selected Schools of Jabalpur City

Anju Bala Sahu
Department of Psychiatric, Government Nursing College, NCCB Medical College, Jabalpur, Madhya Pradesh, India

Abstract

Background: Pubertal transition involves significant physical and psychological changes, often leading to stress among adolescent girls. Their ability to cope with these changes plays a crucial role in shaping their long-term mental well-being. This study aimed to assess stress levels, coping strategies, their interrelationship, and associations with demographic factors among adolescent girls.

Materials and Methods: A cross-sectional descriptive study was conducted among 300 school-going adolescent girls (aged 11–18 years) in Jabalpur using non-probability purposive sampling. Data were collected through a self-developed, validated stress questionnaire and a coping strategy scale. An information booklet was later provided. Data were analyzed using descriptive and inferential statistics.

Results: Moderate stress levels were observed in 66% of girls aged 11–14 and 63% of those aged 15–18. Coping strategy usage was also substantial in both age groups, with 67% (11–14 years) and 51% (15–18 years) employing effective strategies. A negative correlation ($r = –0.20$) was found between stress and coping in younger adolescents, and a positive correlation ($r = 0.70$) in older adolescents. Significant associations were found between stress levels and demographic variables such as age, education, family type, and age at menarche.

Conclusion: Adolescent girls commonly experience stress during pubertal changes, but many adopt coping strategies. Timely intervention through education and counseling, including tools like information booklets, can help mitigate stress and enhance healthy coping.

Keywords: Adolescents, coping strategies, health education, menarche, mental health, puberty, stress

Introduction

Adolescence is a dynamic and transitional phase in human development marked by rapid physiological, psychological, and social changes. Among these, puberty represents a critical biological milestone where children begin to develop secondary sexual characteristics and gain reproductive maturity. For girls, this phase is typically characterized by the onset of menarche, breast development, growth spurts, and a range of hormonal changes that influence emotional and cognitive functioning.[1] These transformations, though natural, often come with confusion, anxiety, and emotional stress – particularly when not accompanied by appropriate education, support, or understanding.

The World Health Organization defines adolescence as the age between 10 and 19 years, during which individuals undergo dramatic transitions from childhood to adulthood. For girls, pubertal changes usually commence between the ages of 8 and 13 years and are completed by around 15–17 years.[2] While the sequence of physiological changes remains fairly

Date of Submission: 25-04-2025
Date of Revision: 13-05-2025
Date of Acceptance: 30-05-2025

Access this article online
Website: https://innovationaljournals.com/index.php/ijns
ISSN No: 2581-463X
DOI: 10.31690/ijns.2025.v010i02.003

Address for correspondence:
Anju Bala Sahu, Department of Psychiatric, Government Nursing College, NCCB Medical College, Jabalpur, Madhya Pradesh, India.
E-mail: anjusahu26@gmail.com

consistent across individuals, the timing and psychosocial impact vary widely, influenced by factors such as genetics, nutrition, family environment, socioeconomic status, and cultural context.[3] During this phase, girls experience physical development alongside increased vulnerability to mental health concerns such as anxiety, depression, poor body image, and stress, particularly if they lack knowledge about the biological processes they are undergoing.[4]

Studies have highlighted that many adolescent girls enter puberty with little or no understanding of what to expect, often receiving fragmented or inaccurate information from peers, media, or even family members. As a result, the onset of menarche and other pubertal changes are sometimes perceived as frightening or shameful experiences, rather than as natural developmental events.[5] The gap in education regarding menstruation, sexual health, and body changes remains a persistent issue in various regions, including urban and semi-urban areas of India. In some cases, this lack of awareness leads to maladaptive stress responses, social withdrawal, poor academic performance, and low self-esteem.[6]

Coping strategies play a crucial role in how adolescents manage the stress associated with pubertal changes. These strategies may be emotional (e.g., avoidance and denial) or problem-focused (e.g., seeking information and support). Studies have found that adolescents who possess effective coping mechanisms tend to adapt better to puberty and are less likely to experience adverse mental health outcomes.[7] Conversely, inadequate or avoidant coping strategies can exacerbate stress and contribute to long-term psychological difficulties.[8]

In the Indian context, research has shown that a significant proportion of adolescent girls – especially those studying in government or rural schools – lack adequate knowledge about reproductive health and experience moderate-to-high levels of stress during puberty.[9] Cultural taboos and limited open discussion on topics such as menstruation and puberty often prevent girls from voicing their concerns or seeking guidance. These factors underscore the urgent need for structured educational interventions, such as information booklets and counseling sessions, which can demystify pubertal changes and promote healthier coping mechanisms.

Various studies have emphasized that adolescence is an impressionable age, where timely education can shape lifelong health behaviors and attitudes.[10] Puberty, being a period of neuroendocrine and emotional plasticity, offers a critical window for targeted interventions that can support adolescents in navigating this challenging life stage. Moreover, with increasing academic pressures, family expectations, and the influence of media, today's adolescent girls face stressors that are vastly different and more complex than those experienced by earlier generations.[11]

Despite the increasing awareness in health and education sectors, there remains a considerable gap in the structured assessment of stress levels and coping strategies among adolescent girls specifically related to pubertal changes – especially in semi-urban and urban Indian settings. Jabalpur city, like many others, comprises a diverse student population where disparities in access to reproductive health education are evident. This study was therefore undertaken to assess the perceived stress and coping strategies among adolescent girls regarding pubertal changes, with the broader aim of developing an informative, easy-to-understand booklet to support their psychosocial well-being. Through this effort, the study seeks not only to highlight the prevalence and nature of stress during puberty but also to promote evidence-based educational materials that can be integrated into school health programs.

The objectives of the study are to

1. Assess the level of stress perceived by adolescent girls regarding pubertal changes
2. Assess the coping strategies used by adolescent girls regarding pubertal changes.
3. Find the relationship between the perceived stress and coping strategies of adolescent girls regarding pubertal changes.
4. Comparison of level of perceived stress between two age group of adolescent girls 11–14 and 15–18 years regarding pubertal changes.
5. Associate the perceived stress among adolescent girls regarding pubertal changes with selected demographic variables.

Hypotheses

- H_1: Adolescent girls will experience a significant degree of stress related to the pubertal changes
- H_2: There will be a significant relationship between perceived stress and coping strategies of adolescent girls regarding pubertal changes
- H_3: There will be a significant association between the perceived stress among adolescent girls regarding pubertal changes with their selected demographic variables.

Materials and Methods

Research approach and design

The study adopted a descriptive, non-experimental research approach using a cross-sectional survey design. This design was chosen to assess the levels of stress and the coping strategies adopted by adolescent girls during pubertal transition, without altering or manipulating any variables.

Setting and population

The research was conducted in selected schools in Jabalpur city, Madhya Pradesh. The target population consisted of adolescent girls between the ages of 11 and 18 years who were attending these schools during the data collection period.

Inclusion criteria

- Adolescent girls aged between 11 and 18 years
- Girls enrolled in schools within Jabalpur city
- Those who were present during the time of data collection
- Girls who could read and write in either Hindi or English.

Exclusion criteria

- Girls who were not present during the data collection
- Those who did not provide consent to participate in the study.
- Girls who had any documented cognitive or communication impairments that could interfere with questionnaire completion.

Sampling and sample size

A total of 300 adolescent girls were selected through non-probability purposive sampling. The sample was stratified into two age groups – 11–14 years and 15–18 years – to facilitate comparison between early and late adolescence. This sample size was deemed adequate to meet the objectives of the study and ensure representative insights.

Tools for data collection

The data collection tool was a structured, self-developed questionnaire composed of three parts:

- Demographic data sheet: Capturing age, class, socioeconomic status, family type, elder siblings, dietary habits, prior knowledge of puberty, and age of menarche.
- Stress questionnaire: Designed to measure physical and psychological stress experienced during puberty.
- Coping strategies scale: Developed to identify behavioral and cognitive strategies used to manage pubertal stress.

All tools were validated by a panel of subject experts and underwent both language editing and pilot testing. Reliability testing confirmed the tools to be suitable for the main study.

Pilot study

A pilot study was conducted on 10% of the sample to assess the clarity and feasibility of the tools. Based on the findings and expert suggestions, minor modifications were made to improve the questionnaire's relevance and ease of understanding.

Ethical considerations

Ethical clearance was obtained from the Institutional Ethics Committee. Written permission was secured from school principals. Informed consent was obtained from all participants, and assent was sought where appropriate. Confidentiality, anonymity, and the right to withdraw at any stage of the study were assured to all participants.

Data collection procedure

The study was introduced to the participants in a classroom setting, and the purpose of the research was explained. Participants were then asked to complete the questionnaires under supervision. After completion, each participant received an information booklet designed to enhance understanding of pubertal changes and promote healthy coping.

Data analysis

Data were analyzed using the Statistical Packages for the Social Sciences software. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic data and to quantify levels of stress and coping strategies. Inferential statistics, including Chi-square tests and Pearson correlation coefficients, were used to test hypotheses and examine relationships between variables.

Results

The data collected from 300 adolescent girls were analyzed and interpreted to meet the objectives of the study. The results are presented in the following subsections:

The demographic characteristics of the adolescent girls are summarized in Table 1. The sample consisted of two equally distributed age groups: 11–14 years ($n = 150$) and 15–18 years ($n = 150$). In the younger age group, the majority (80%) were aged 11–12 years and studying in classes 6th–7th, whereas most participants in the older group (73%) were 15–16 years old and in classes 10th–11th. Across both groups, the majority of girls came from families with a monthly income below ₹10,000, reflecting a lower socioeconomic status (66% in 11–14 years and 65% in 15–18 years). Joint families were the most common family structure reported in both age brackets (63% and 66%, respectively). A significant proportion of girls in both groups had elder siblings and followed a non-vegetarian dietary pattern. Prior knowledge regarding pubertal changes was reported by 63% of girls aged 11–14 years and 60% of those aged 15–18 years. The most commonly reported age at menarche in both groups was 11 years [Table 1].

Table 2 presents a comparative summary of high-frequency stress indicators among adolescent girls aged 11–14 and 15–18 years, categorized under physical, social, psychological, and cognitive domains. The data reflect the proportion of participants in each age group who reported experiencing each symptom "often" or "always," thereby capturing the intensity and frequency of pubertal stress experiences.

While stress responses were originally collected using a five-point Likert scale (Never, Rarely, Sometimes, Often, and Always), for the purpose of clarity and interpretability in scholarly reporting, only the highest levels of response ("Often" + "Always") are presented. This analytical focus

Table 1: Demographic profile of adolescent girls ($n = 300$)

Variable	11–14 years ($n = 150$) (%)	15–18 years ($n = 150$) (%)
Age (most common)	11–12 years (80)	15–16 years (73)
Education (most common)	6th–7th (80)	10th–11th (73)
Socioeconomic status	<Rs. 10,000/month (66)	<Rs. 10,000/month (65)
Family type	Joint (63)	Joint (66)
Elder sibling present	Yes (63)	Yes (60)
Dietary pattern	Non-vegetarian (73)	Non-vegetarian (75)
Previous knowledge on puberty	Yes (63)	Yes (60%)
Age at menarche (most common)	11 years	11 years

enables the identification of more clinically relevant stress patterns and supports concise comparison across age groups – consistent with best practices in quantitative health research. Full response distributions can be made available as supplementary material upon request.

The findings indicate a higher prevalence of intense stress among younger adolescents (11–14 years), particularly in domains related to bodily changes, emotional fluctuations (e.g., mood swings, irritability), and cognitive processing (e.g., disorientation and difficulty concentrating). Older adolescents (15–18 years) demonstrated lower stress frequencies across most indicators, suggesting greater adaptation to pubertal changes with age and maturity. These observations support the study's objective of identifying perceived stress patterns during adolescence and emphasize the importance of early, targeted interventions to support psychosocial adjustment during the pubertal transition [Table 2].

Table 2: Distribution of stress indicators among adolescent girls (*n*=300)

Domain	Stress indicator	11–14 years (%)	15–18 years (%)
Physical	Upset by bodily changes	46.6	0
	Upset due to menstruation onset	66.6	0
	Nausea/upset stomach	60	60
	Sweating or chills	6.6	6.6
	Headache	40	40
Social	Feeling isolated	20	20
	Sleep pattern changes	33.3	20
	Eating pattern changes	53.3	40
	Difficulty communicating	33.3	20
	Difficulty listening	53.3	0
Psychological	Irritability	46.6	20
	Anxiety	33.3	40
	Restlessness	33.3	0
	Mood swings	76.6	13.3
	Feeling overwhelmed	26.6	6.6
Cognitive	Forgetfulness	39.9	20
	Disorientation	86.6	0
	Confusion	26.6	20
	Slow thinking/ analysis	53.3	20
	Difficulty concentrating	26.6	40

Combined frequency (%) of "Often" + "Always" responses by domain and item

Table 3 summarizes both the distribution of stress levels and the average stress scores across two adolescent age groups. Among the 11–14 years group, the majority (66%) experienced moderate stress, with a notably higher proportion (19%) reporting severe stress compared to the 15–18-year group (10%).

The mean stress score for the younger age group was 35.2 ± 11.31, which was significantly higher than the 31.7 in the older group. The observed *t*-value (2.69) exceeds the critical value at $P < 0.05$, indicating a statistically significant difference in stress levels. This supports hypothesis H_1 and highlights a greater stress burden in early adolescents.

Table 4 presents the distribution of coping strategies used by adolescent girls in two age groups (11–14 years and 15–18 years) in response to pubertal changes. The responses are categorized into four levels – Never, Some, Much, and Very Much – and expressed as percentages.

In the 11–14-year age group, the most frequently used coping strategies reported as "Very Much" included the use of mass media (47%), meditation (20%), and asking for support from family or professionals (27%). Other commonly used strategies were taking a to-do list (60%), eating healthy food (30%), and using relaxation techniques (40%) under the "Much" category.

In contrast, the 15–18-year group showed a higher tendency to use effective coping strategies "Very Much." The highest percentages were seen in meditation (57%), taking good sleep (43%), engaging in a hobby (43%), and spending time in nature (33%). This group also showed more balanced use across "Much" and "Very Much" categories for strategies like exercise, healthy eating, and to-do list creation.

Notably, practice of mindfulness had a higher rate of non-use, with 60% in 11–14 years and 63% in 15–18 years reporting "Never." Similarly, eating spicy food was generally avoided or less preferred, especially in the older group, where only 6.7% selected "Much" or "Very Much."

Overall, older adolescents demonstrated greater engagement with positive coping mechanisms, especially in the "Very Much" category, suggesting a developmental progression in adaptive coping. This pattern aligns with the hypothesis that coping strategies become more structured and intentional with increasing age.

Table 5 compares coping strategies between adolescent girls aged 11–14 and 15–18 years. While both groups mostly

Table 3: Comparison of stress levels and mean stress scores among adolescent girls aged 11–14 and 15–18 years (*n*=300)

Age group	Stress level	Frequency (n)	Percentage	Mean score	SD
11–14 years	Mild	23	15	35.2	±11.31
	Moderate	99	66		
	Severe	28	19		
15–18 years	Mild	41	27	31.7	—
	Moderate	94	63		
	Severe	15	10		

t=2.69, $P<0.05$→Significant difference in stress scores between the two age groups

used strategies at the "Much" level, a higher percentage of 15–18 year olds (34%) reported "Very Much" use compared to only 7% in the younger group. The mean coping score was higher in the older group (24.1 vs. 21.3), and the difference was statistically significant ($t = 3.45$, $P < 0.05$), indicating better coping in older adolescents.

Table 6 shows the correlation between perceived stress and coping strategies among adolescent girls. In the 11–14-year group, a negative correlation (r = −0.20) was found, whereas the 15–18-year group showed a positive correlation (r = +0.70). Both relationships were statistically significant, indicating that coping response patterns differ by age, with older girls demonstrating more adaptive coping as stress increases.

Table 7 shows the association between perceived stress and selected demographic variables among adolescent girls aged 11–14 years. The Chi-square test revealed statistically significant associations between stress levels and all examined variables, including the age of the adolescent, education level, socioeconomic status, type of family, presence of elder siblings, dietary pattern, previous knowledge about puberty, and age at the onset of menstruation. Each variable had a Chi-square value exceeding the critical value at the 0.05 level of significance, indicating that these demographic factors are meaningfully related to the perceived stress experienced by younger adolescent girls regarding pubertal changes.

Table 8 presents the association between perceived stress and demographic characteristics among adolescent girls aged 15–18 years. Similar to the younger group, all assessed variables – such as age, education, socioeconomic status, type of family, elder siblings, dietary pattern, previous knowledge, and age at menarche – were found to have a statistically significant association with perceived stress levels. The Chi-square values for each exceeded the respective critical values at the 0.05 level, confirming that demographic background significantly influences stress perception in older adolescent girls during pubertal transition.

Discussion

The present study assessed the perceived stress, coping strategies, and their associations with demographic variables among adolescent girls experiencing pubertal changes. The findings indicate a significant presence of stress during adolescence and reflect variations in coping approaches between different age groups, further supporting the need for targeted educational and psychological interventions.

Table 4: Distribution of coping strategies used by adolescent girls regarding pubertal changes

Coping strategy	11–14 years (n=150)				15–18 years (n=150)			
	Never	Some	Much	Very much	Never	Some	Much	Very much
Care for yourself (hygiene)	40	0	40	20	0	20	40	40
Exercise	0	60	20	20	13	20	40	27
Focus on a task (e.g., clean/cook)	60	10	17	13	20	20	40	20
Practice mindfulness	60	0	40	0	63	20	17	0
Use relaxation/breathing techniques	20	20	40	20	0	6.7	33	60
Meditation	6.7	20	53	20	13	13	17	57
Create a to-do list	13	13	60	13	17	17	24	43
Engage in a hobby (music, drawing, etc.)	20	60	20	0	20	27	11	43
Play with a pet	20	40	20	20	20	40	13	27
Spend time in nature	20	0	27	17	20	20	27	33
Ask for support (friends/family/professionals)	20	33	20	27	20	47	17	17
Take good sleep	40	27	20	13	17	17	23	43
Eat healthy food	20	20	30	30	6.7	23	30	40
Eat spicy food	40	40	10	10	40	47	6.7	6.7
Use of mass media (TV, mobile, etc.)	6.7	6.7	40	47	13	20	20	47

The data are expressed as percentage (%)

Table 5: Comparison of coping strategies used by adolescent girls regarding pubertal changes (n=300)

Age group	Some	Much	Very much	Mean Score	SD	Mean difference	t-value	Significance
11–14 years	39 (26)	100 (67)	11 (7)	21.3	±7.44	2.8	3.45	P<0.05 (Significant)
15–18 years	23 (15)	76 (51)	51 (34)	24.1				

The t-test shows a statistically significant difference in coping strategy usage between the two age groups (t=3.45>1.96, P<0.05)

Table 6: Correlation between perceived stress and coping strategies among adolescent girls regarding pubertal changes (n=300)

Age group	Mean stress score	Mean coping score	Correlation coefficient (r)	Direction	Inference
11–14 years	33.4	22.7	−0.20	Negative	Significant negative correlation
15–18 years	33.4	22.7	+0.70	Positive	Significant positive correlation

The correlation in the 11–14-year group indicates that higher perceived stress is associated with lower coping ability, while in the 15–18-year group, higher stress correlates with better coping ability. Both correlations are statistically significant (P<0.05)

Table 7: Association between the perceived stress among adolescent girls regarding pubertal changes with selected demographic variables (11–14 years)

S. no.	Variable	Good	Average	Poor	Total	df	Chi-value	*P*-value	Inferences
1	Age of adolescent (in years)								
a	11–12 years	13	50	15	78	2	7.2 (3.84)	0.30	S
b	13–14 years	10	49	13	72				
c	15–16 years	-	-	-	-				
d	17–18 years	-	-	-	-				
2	Education (respondents)								
a	6^{th}–7^{th}	20	70	27	117	2	5.2 (3.84)	0.50	S
b	8^{th}–9^{th}	3	29	1	33				
c	10^{th}–11^{th}	-	-	-	-				
d	12^{th}	-	-	-	-				
3	Socioeconomic status of family								
a	<10,000/month	19	80	10	109	6	13.9 (12.5)	0.30	S
b	20,000/month	4	19	15	38				
c	40,000/month	0	0	3	3				
d	60,000/month OR above	0	0	0	0				
4	Type of family								
a	Nuclear	10	45	13	68	4	10.9 (9.49)	0.20	S
b	Joint	13	54	15	82				
c	Extended	0	0	0	0				
5	Elder siblings								
a	Yes	15	59	18	92	2	5.3 (3.84)	0.50	S
b	No	8	40	10	58				
6	Dietary pattern								
a	Vegetarian	10	30	5	45	2	4.1 (3.84)	0.50	S
b	Non vegetarian	13	69	23	105				
7	Previous knowledge								
a	Yes	18	49	18	85	2	6.7 (3.84)	0.30	S
b	No	5	50	10	65				
8	Menstrual cycle started at								
a	<11 years	5	23	14	42		14.4 (12.5)	0.20	S
b	12 years	4	50	14	68				
c	13 years or above	13	20	0	33				
d	Not yet started	1	6	0	7				

S: Significance at (0.05 level of significance)

In terms of perceived stress, the results revealed that among adolescent girls aged 11–14 years, 66% experienced moderate stress and 19% reported severe stress. In contrast, in the 15–18-year group, moderate stress remained high at 63%, but the percentage reporting severe stress decreased to 10%. The overall mean difference in stress scores was statistically significant ($t = 2.69$, $P < 0.05$), indicating that younger adolescent girls may experience more intense emotional reactions during pubertal changes. These results support the hypothesis (H_1) that adolescent girls experience a significant degree of stress during puberty.

This is consistent with the findings of Martyn-Nemeth *et al*.,[12] who found that increased stress and low self-esteem in adolescents were associated with avoidant coping, unhealthy eating behaviors, and depressive moods. Her study highlighted the need for stress-reduction strategies and positive coping skill development to prevent both psychological and physical health issues among adolescents.

Regarding coping strategies, the study found that most adolescent girls in both age groups predominantly used coping strategies to a "Much" extent (67% in 11–14 years and 51% in 15–18 years). However, a significantly higher percentage of older girls (34%) reported using coping strategies "Very Much" compared to younger girls (7%). The difference in mean coping scores was also statistically significant ($t = 3.45$, $P < 0.05$), confirming the hypothesis that older adolescents exhibit more mature and effective coping mechanisms. These results are in line with Bruce E. Compas (1987), who reviewed multiple dimensions of how children and adolescents adapt to stress. He emphasized that both problem-focused and emotion-focused strategies are essential and that coping skills improve with age and developmental experiences.

A key finding of the study was the correlation between stress and coping strategies. Among 11–14-year-olds, a negative correlation ($r = -0.20$) was found, indicating that higher stress was associated with lower coping ability. Conversely, a strong positive correlation ($r = +0.70$) was observed in the 15–18 years group, suggesting that older adolescents with higher stress were more likely to engage in coping behaviors. This supports hypothesis H_2 and is reinforced by the findings of Mehta *et al*.,[13] who reported that adolescent girls employed more social support and problem-solving strategies than boys when coping with stress. Their study of 2000 schoolchildren in Delhi confirmed gender differences and age-related trends in stress response and adaptation.

Table 8: Association between the perceived stress among adolescent girls regarding pubertal changes with selected demographic variables (15–18 years)

S. no.	Variable	Good	Average	Poor	Total	df	Chi-value	*P*-value	Inferences
1	Age of adolescent (in years)								
a	11–12 years	-	-	-	-	2	6.3 (3.84)	0.30	S
b	13–14 years	-	-	-	-				
c	15–16 years	29	49	7	85				
d	17–18 years	12	45	8	65				
2	Education (respondents)								
a	6^{th}–7^{th}	-	-	-	-	2	4.7 (3.84)	0.50	S
b	8^{th}–9^{th}	-	-	-	-				
c	10^{th}–11^{th}	20	20	1	41				
d	12^{th}	21	74	14	109				
3	Socioeconomic status of family								
a	<10,000/month	25	79	5	109	6	13.2 (12.5)	0.30	S
b	20,000/month	16	15	5	36				
c	40,000/month	0	0	3	3				
d	60,000/month OR above	0	0	2	2				
4	Type of family								
a	Nuclear	20	41	3	64	4	10.1 (9.49)	0.30	S
b	Joint	21	53	12	86				
c	Extended	0	0	0	0				
5	Elder siblings								
a	Yes	35	60	8	103	2	4.1 (3.84)	0.50	S
b	No	6	34	7	47				
6	Dietary pattern								
a	Vegetarian	30	32	6	68	2	4.8 (3.84)	0.50	S
b	Non Vegetarian	11	62	9	82				
7	Previous knowledge								
a	Yes	34	50	10	94	2	5.4 (3.84)	0.30	S
b	No	7	44	5	56				
8	Menstrual cycle started at								
a	<11 years	4	25	4	33		13.7 (12.5)	0.30	S
b	12 years	3	29	4	36				
c	13 years or above	34	40	7	81				
d	Not yet started	0	0	0	0				

S: Significance at (0.05 level of significance)

The study also found a significant association between perceived stress and various demographic variables such as age, education, socioeconomic status, type of family, elder siblings, dietary pattern, previous knowledge about puberty, and age at menarche. These findings confirm hypothesis H_3 and are supported by Teicher *et al*.,[14] whose work links early-life stress and developmental adversity with long-term alterations in brain structure and function. His findings suggest that early psychosocial stress can impact cognitive and emotional development, which may partly explain the variability in stress responses seen among adolescents in different socioeconomic and familial contexts.

Further, the demographic analysis revealed that the majority of participants across both age groups belonged to joint families, had elder siblings, and followed a non-vegetarian diet. Many in the 15–18 years group had prior knowledge of pubertal changes, which likely contributed to their more effective use of coping strategies. This aligns with the research by Kaltiala-Heino *et al*.,[15] which showed that earlier pubertal timing was associated with increased internalizing symptoms such as anxiety and depression in girls, especially those with limited support systems. His findings also underscore how early pubertal onset can increase vulnerability to psychological distress.

Overall, the results underscore the complex interplay between biological development, psychosocial stress, and coping behaviors during adolescence. The study suggests that interventions – such as informational booklets, counseling, and school-based health education – are essential in supporting adolescent girls through pubertal transitions. Such programs can empower girls with the knowledge and skills needed to manage stress more effectively and adopt adaptive coping mechanisms.

Conclusion

The study concludes that adolescent girls experience significant stress related to pubertal changes, with younger adolescents showing higher stress levels. Coping strategies improved with age, and there was a significant relationship between stress, coping, and various demographic factors, highlighting the need for age-appropriate education and support during adolescence.

Conflict of Interest

None.

Acknowledgments

None.

Funding

None.

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How to cite this article: Sahu AB. Stress and Coping Strategies among Adolescent Girls Regarding Pubertal Changes: A Cross-Sectional Study in Selected Schools of Jabalpur City. Indian J Nurs Sci 2025;10(2):14-21.