Research Report

PREVALENCE OF PERCEIVED STRESS AMONG HIGHER SECONDARY SCHOOL STUDENTS IN AN EDUCATIONAL DISTRICT OF SOUTH KERALA

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Abstract

Background: Adolescence is a period when one's mental resilience builds up. Also, it is a period when one may develop mental health problems, stress being one of the causes. Schools become a medium for early detection of those suffering from such issues and a platform for providing preventive measurements. Hence, this study aimed to assess the prevalence of perceived stress among students in higher secondary schools of the Thiruvananthapuram educational district, Kerala. Also, this study attempted to find the association between various socio-demographic factors and perceived stress. **Methods:** This was a community-based, cross-sectional study conducted using stratified cluster sampling in 539 adolescents of 48 different classes from eight higher secondary schools (four government, two private-aided, and two private-unaided) over one year from August 2018, using the Perceived Stress Scale-10. Informed consent and assent were obtained as required from the participants. A Chi-square analysis was performed to assess statistical significance. Odds Ratio and confidence intervals were calculated to estimate the strength of association. Logistic regression analysis was done to determine the risk factors. The correlation of academic performance with perceived stress was assessed using the Spearman-Rank test. **Results:** Significant levels of stress were observed in 34.1% of the participants, and 8.7% of those with significant stress had severe perceived stress. The levels of perceived stress were high among those who performed better academically and there was a positive correlation between both. Age and stream of their study were the factors that showed an association with the stress levels experienced by the students. **Conclusion:** Adolescents undergo immense stress, academics being an unavoidable stressor. Contrary to expectations, higher stress levels were observed in students who performed better. Employment of stress reduction programs in schools ought to be considered a priority.

Keywords: Adolescents, perceived stress, academic performance, higher secondary schools, Thiruvananthapuram educational district

Introduction

Globally, it is estimated that there are around 1.3 billion adolescents who account for about 16% of the global population.[1] India homes 253

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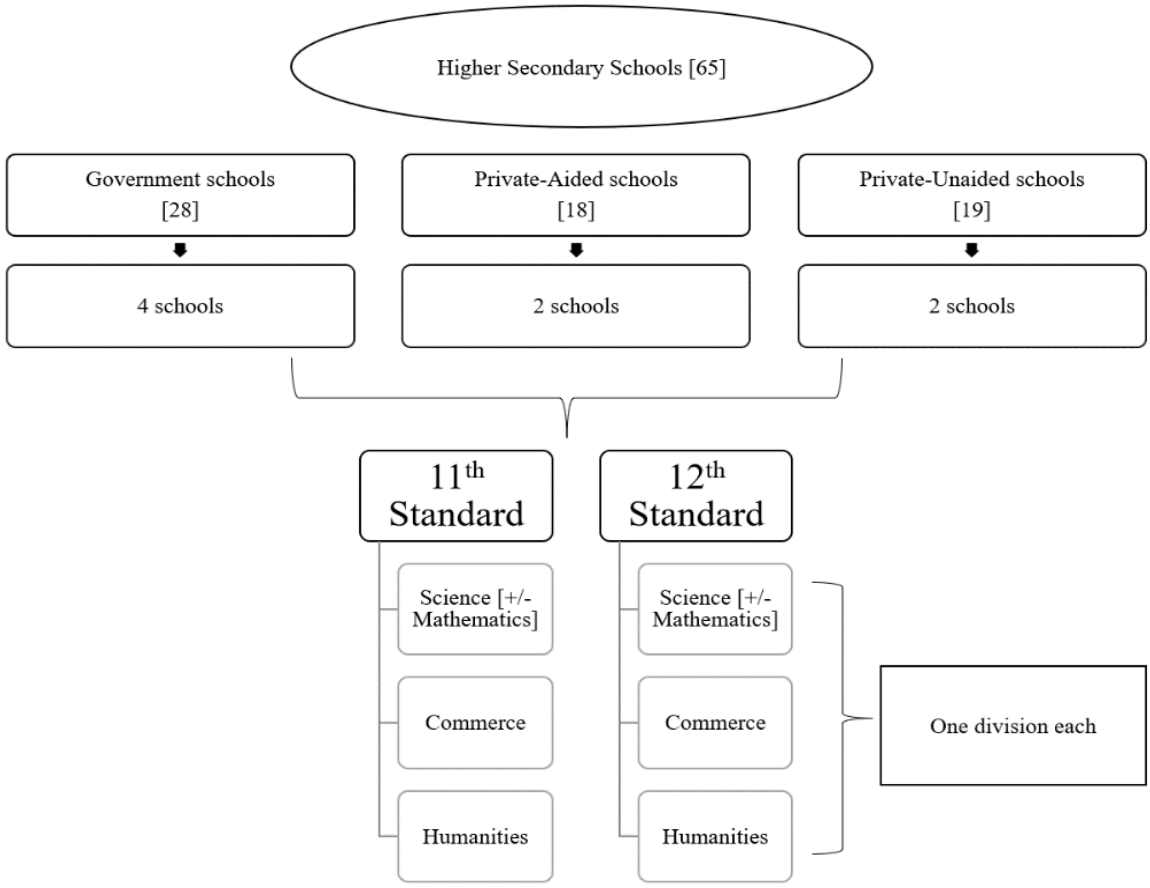
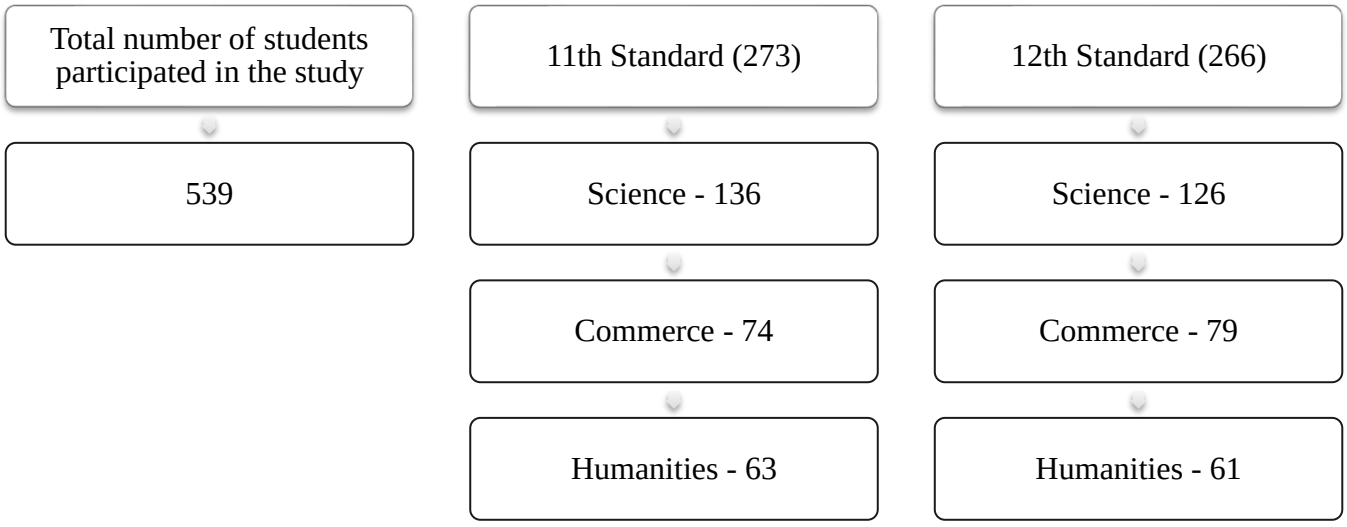
Figure 1. The procedure of the study



million of them, the most in the world, and they constitute one-fourth of the country's population.[2] In the state of Kerala, there are 27,67,216 boys and 26,66,106 girls in the adolescent population.[3] Although an adolescent is usually considered a miniature form of an adult human, the period of adolescence is distinctive with its unique developmental features. Apart from physical maturation, it is also a phase of cognitive, social, and moral growth. Adolescents will learn to detach themselves from the protection of parents, try blending into peer groups, and discern one's identity and role in society.[4] Adolescence becomes a stage of transition from an impulse-driven child to a rational adult. The Lancet Commission on Adolescent Well-Being highlights adolescence as a crucial period in an individual's development.[5] Thus, adolescents are a group of individuals requiring much attention and utmost care.

The World Health Organization (WHO) observed that one in seven individuals aged 10-19 years suffer from a mental health issue – the most common being anxiety, depression, and substance use.[6] Adolescents and young adults are the most at risk of death from injuries such as road traffic accidents, drowning, interpersonal violence, self-harm, and maternal conditions. The WHO identifies that half of all mental health disorders in adulthood originate before age 14, yet many cases remain unidentified and untreated.[7] Stress is a commonly associated factor for developing these disorders.[8] Stress, as defined by Hans Selye, is a systemic response to any changing event or stressor.[9] Psychological stress is defined as a toilsome and demanding association between oneself and the environment.[9] Stress makes a person vulnerable to physical ailments, social withdrawal, and poor educational and social

Figure 2. Participant distribution in the study



achievements and can potentiate indulgence in risky behaviors.[5] Several factors contribute to the development of prolonged stress, including biological, psychological, and social factors. With an altered hypothalamo-pituitary-adrenal axis, the adolescent brain is particularly sensitive to stress and exhibits heightened stress reactivity.[10] Though the presence of stress is significant, it is the ability to cope that determines if it is distress or eustress. Here comes the concept of perceived stress. Lazarus and Folkman described the cognitive appraisal model of stress. It consists of primary appraisal, which is the evaluation of the stressful life event, and secondary appraisal, which is the assessment of one's own ability to cope with the stressor.[9] Perceived stress occurs when one subjectively evaluates the severity of the stress, the resources one is equipped with to cope with it, and the degree to which they can affect one's life at that particular period.[11] Perceived stress is associated with a poorer quality of life.[12] A high level of perceived stress was seen to be associated with a six-fold rise in mental disorders among adolescents.[13] It was observed that the school environment is one factor in predicting perceived stress in an adolescent.[14] The education of adolescents has gained a positive trend in the last few decades. UNESCO estimated that compared to the 60% secondary school enrolment rate in 2000, the rate in 2020 was estimated to be 77%.[15] The UNICEF notes a decline in the school drop-out rate, too. In 2000, around 175 million adolescents dropped out of senior secondary school, and in 2020, only 132 million discontinued their studies.[16] India, too, has shown a similar trend. In 2000, enrolment in secondary schools was 52%. It rose to 75% in the year 2020.[17] Peer influence, academic and school demands, parental pressure, and financial issues are a few of the social factors that can adversely affect the mental health of an adolescent.[18] Global statistics show that adolescents who experience immense stress are at increased risk of suicide.[19] While assessing the risks associated with suicide ideation among adolescents, an important factor that was determined was academic dissatisfaction along with other issues.[20] Thus, schools can act both as an effective platform for delivering several preventive and treatment interventions at the community level and as a source of stress. Though stress among adolescents is a relevant topic and requires the attention of paramount quality, little research has been conducted to identify the prevalence of stress and the factors associated with the stress. This study aims to bridge the research

gap and provide insight into various socio-demographic factors associated with adolescent stress. The primary objective of the study was to estimate the prevalence of perceived stress among adolescents enrolled in higher secondary schools in the Thiruvananthapuram educational district, Kerala. Also, this study intended to correlate the academic performance of the students and the association of other sociodemographic factors with perceived stress.

Materials and Methods

This community-based, cross-sectional study was conducted in eight Higher Secondary Schools in Thiruvananthapuram educational district, Kerala, including four government, two private-aided, and two private-unaided schools. The sampling technique employed was stratified cluster sampling. The cluster unit of this study was a class division. The study was conducted after obtaining clearance from the Institutional Research and Institutional Ethics Committees (IEC No. 14/20/2017/MCT). The study period was from August 2018 to August 2019.

For an expected prevalence of 21.1%[21] and a maximum allowed α-error of 5%, the sample size was calculated as 256. As cluster sampling was employed, a design effect of 2 was considered, and the sample size was estimated to be 512, which was approximated to 515. All the students enrolled in the selected higher secondary schools were requested to participate in the study. Those subjects who were unwilling or who were not present at the time of the study were excluded.

After obtaining approval from the Institution Ethics Committee, eight schools were selected for the study from 65 higher secondary schools in Thiruvananthapuram educational district using stratified cluster sampling. The unit of the study was a class division. Permission was obtained from the Regional Deputy Director of Higher Secondary Education before the performance of the study. Written informed assent was obtained from all the study participants after obtaining consent from their parents. Participants over 18 years were requested to consent to the study after explaining the study, the details required, and how the data would be used. They were also assured of maintaining anonymity if the data were to be published. A copy of the consent form was handed over to the students for any further contact or query. Written informed consent was obtained from the principals and class teachers of the concerned schools, as well.

Table 1. Socio-demographic data of the study sample

Variable		Frequency (%) (N = 539)
Age in years	<17	224 (41.6)
	17 or more	315 (58.4)
Gender	Boys	282 (52.3)
	Girls	257 (47.7)
Residence	Urban	246 (45.6)
	Semi-urban/rural	293 (54.4)
Type of family	Nuclear	297 (55.1)
	Extended/ Joint	242 (44.9)
Educational status-father	Graduation/above	139 (25.8)
	Below graduation	400 (74.2)
Educational status-mother	Graduation/above	119 (22.1)
	Below graduation	420 (77.9)
Occupational status-parents	Employed mother	49 (9.1)
	Others	490 (90.9)
SES	APL	462 (85.7)
	BPL	77 (14.3)
School management	Private-unaided	139 (25.8)
	Others	400 (74.2)
Grade	XI	273 (50.6)
	XII	266 (49.4)
School syllabus	CBSE	141 (26.2)
	State	398 (73.8)
Medium of Teaching	English	429 (79.6)
	Malayalam	110 (20.4)
Stream of study	Science	262 (48.6)
	Others	277 (51.4)
Academic performance	>50%	453 (84.0)
	<50%	86 (16.0)

APL – Above Poverty Line, BPL – Below Poverty Line, CBSE, Central Board of Secondary Education, SES – Socio-economic status

Table 2. Association of perceived stress with socio-demographic variables

Variable		Perceived Stress Level		OR (95% CI)	χ^2 (df=1)	P value
		Severe (n1 = 184) Frequency (%)	Low (n2 = 355) Frequency (%)			
*Age in years	<17 years	93 (41.5)	131 (58.5)	1.75 (1.22-2.51)	4.51	0.03
	≥17 years	91 (28.9)	224 (71.1)			
Gender	Boys	99 (35.1)	183 (64.9)	1.09 (0.64-1.31)	0.13	0.94
	Girls	85 (33.1)	172 (66.9)			
Residence	Urban	62 (30.1)	144 (69.9)	0.74 (0.83-2.33)	2.42	0.12
	Others	122 (36.6)	211 (63.4)			
Socio-economic status	APL	160 (34.6)	302 (65.4)	1.17 (0.86-1.44)	1.49	0.53
	BPL	24 (31.2)	53 (68.8)			

APL – Above Poverty Line, BPL – Below Poverty Line, CI – Confidence Interval, *df* – degree of freedom, OR – Odd's ratio, χ^2 – Chi-squared value; * – P value < 0.05

Each division representing various streams of study, i.e., Science, Commerce, and Humanities, from XI and XII grades were chosen from the selected schools. Thus, 48 classes from the eight schools were included (see Figure 1).

All students in the class were included in the study. Confidentiality was ensured and maintained throughout the study. References and services were provided for those who were in need. The authors' contact details were provided to the participants. No criterion was used to select the individuals requiring support. Any participant who needed to approach mental health services was referred for the same. The participants were informed that their concerns required discussion with their parents and would be beneficial if they got involved in the referral. For those students who refused parental involvement in the care, referrals were made after requesting them to be accompanied by a trusted adult during the initial visit to the mental health establishment.

A pre-tested and pre-designed semi-structured questionnaire was used to obtain the students' socio-demographic data. Perceived Stress Scale [PSS-10][22] was used to estimate the stress score. It is a 10-item questionnaire, with each question having a maximum score of 4. Positively stated items [4,5,7,8] are scored in reverse order. The total sum of the items would reach a maximum of 40. The scale is one of the most commonly used psychological tools for assessing stress and has high reliability with a Cronbach's α of 0.78. Scoring of PSS-10 is as follows: 0-13 = low; 14-26 = moderate and 27-40 = high stress. The English version of the scale was used in the study. With the help of bilingual professionals, the PSS-10 and stress factors questionnaire were translated from English to Malayalam, which was then back-translated into English. A comparison between the original and back-translated versions of the questionnaire was carried out by the researcher to ascertain the content validity. The median perceived stress score obtained in this study was 19, above which the scores were classified as high. The score mentioned above served as the threshold due to the scarcity of literature on the instrument's validation for the adolescent population in the Indian context.

The academic scores were obtained from the participants based on their recent examination performance as per their progress records, and these were then categorized as high and low scores, with 65 being the median score. The participants' socio-economic status was categorized as Above Poverty Line (APL) and Below Poverty Line (BPL) based on the ration card colors reported by the subjects. Pink and yellow coloured ration cards were categorized as BPL and blue and white ration cards were categorized as APL. The participants provided information regarding the educational and occupational status of their parents.

Table 3. Association of perceived stress with family variables

Variable		Perceived Stress Level		OR (95% CI)	χ^2 (df=1)	P value
		Severe (n1 = 184) F (%)	Low (n2 = 355) F (%)			
*Type of Family	Nuclear	56 (28.7)	139 (71.3)	0.68 (0.47-0.99)	4.00	0.046
	Joint	128 (37.2)	216 (62.8)			
*Education of father	Graduation/ above	65 (46.8)	74 (53.2)	2.07 (1.40-3.08)	13.05	<0.001
	Below Graduation	119 (29.8)	281 (70.3)			
Education of mother	Graduation/above	141 (33.6)	279 (66.4)	0.89 (0.58-1.37)	0.27	0.60
	Below Graduation	43 (36.1)	76 (63.9)			
Occupation of parents	Employed mother	21 (42.9)	28 (57.1)	1.51 (0.83-2.73)	0.45	0.18
	Others	163 (33.3)	327 (66.7)			

CI – Confidence Interval, *df* – degree of freedom, F – frequency, OR – Odd's ratio, χ^2 – Chi-squared value
* – P value < 0.01

Data collected were entered into MS Excel and analyzed using SPSS version 20, and the results were interpreted accordingly. Chi-square test was done to estimate the significance of the categorical variables. Odds Ratio (OR) and 95% Confidence Interval (95% CI) were calculated to estimate the strength of association. Binary logistic regression was performed between the Perceived Stress Score (dependent variable) and those independent variables, which showed significant associations like age, educational status of parents, school management, school syllabus, stream of study, and academic performance. Correlation was assessed using the Spearman-Rank test.

Results

Of the 539 students who participated, 262 belonged to the science, 151 to commerce, and 126 to the humanities stream (see Figure 2). The sample's mean age was 17.7 years, with a Standard Deviation (SD) of 1.6. Table 1 depicts the sociodemographic data collected for the study. The mean perceived stress score was estimated as 18.7 (SD = 4.8). The median score obtained was 19. About 34.1% of the students showed stress levels above the median score; 8.7% of these participants had severe stress levels.

Perceived Stress and its Association with Socio-demographic Variables

When 41.5% of students below 17 years showed significant levels of perceived stress; only 28.9% of those 17 years of age and above reported stress (OR=1.75; 95% CI= 1.22–2.51; p = 0.03). Significant stress levels were reported by 35.1% of boys and 33.1% of girls, but the difference was not statistically significant (p = 0.94). Among the participants, 30.1% of those residing in urban areas and 36.6% in rural areas showed significant stress levels (p = 0.12). Perceived stress was higher among those students hailing from higher socioeconomic status (34.6%) compared to those from lower socioeconomic status (31.2%), but it showed no statistically significant association (p = 0.44) (see Table 2).

Perceived Stress and its Association with Family Factors

The family type had no significant association with the students' stress levels. 28.7% of those belonging to the nuclear family and 37.2% of those belonging to joint/extended family showed high levels of perceived stress (p=0.046). It was noted that those children who had their mothers with the educational status of graduation or above showed lower levels of perceived stress (33.6%). Those students whose mothers had education below graduation had a higher stress level (36.1%). The difference was not statistically significant (OR = 0.89; 95% CI = 0.58-1.37; p = 0.60). The higher educational status of the father was

Table 4. Association of perceived stress with academic variables

Variable		Perceived Stress Level		OR (95% CI)	χ^2 (df=1)	P Value
		Severe (n1 = 184) Frequency (%)	Low (n2 = 355) Frequency (%)			
**School management	Private-unaided	66 (47.5)	73 (52.5)	2.16 (1.45-3.21)	43.87	<0.001
	Others	118 (29.5)	282 (70.5)			
*School medium	English	157 (36.6)	272 (63.4)	1.77 (1.10-2.86)	11.28	0.02
	Malayalam	27 (24.5)	83 (75.5)			
**Stream of study	Science	108 (41.2)	154 (58.8)	1.86 (1.29-2.66)	19.75	0.001
	Commerce	76 (27.4)	201 (72.6)			
**Academic performance	>50	172 (38.0)	281 (62.0)	3.78 (1.99-7.15)	47.10	<0.001
	<50	12 (14.0)	74 (86.0)			
**School syllabus	CBSE	66 (46.8)	75 (53.2)	2.09 (1.41-3.10)	36.29	<0.001
	State	118 (29.6)	280 (70.4)			

CI – Confidence Interval, df – degree of freedom, OR – Odd's ratio, χ^2 – Chi-squared value
* – P value < 0.05; ** – P value < 0.01

observed to be associated with higher stress levels in the students. High perceived stress levels were seen in 46.8% of those who had their fathers educated beyond graduation, while only 29.8% of the students with their fathers educated graduation had a high level of perceived stress (OR = 2.07; 95% CI = 1.40-3.08; p <0.001). Among those participants who had their mothers employed, 42.9% had severe stress, while 33.3% of those participants with mothers with no formal occupation had high stress levels (p = 0.18) (see Table 3.).

Perceived Stress and its Association with Academic Factors

The median academic score of the sample was observed to be 65. It was observed that students who performed better had higher stress levels compared to those who performed low. Higher levels of perceived stress were seen in 14.0% of those with academic scores below the median and 38.0% of those who scored above the median (OR = 3.78; 95% CI = 1.99-7.15; p <0.001). The study observed that 9.5% of the 11th-standard students and 7.9% of the 12th-standard students had high stress levels (p = 0.162). Participants from the Central Board of Secondary Education (CBSE) syllabus reported being more stressed than those from State syllabus schools. When 29.6% of State syllabus students showed high-stress levels, among the CBSE school students, 46.8% were stressed (OR = 2.09; 95% CI = 1.41–3.10; p <0.001). While assessing the association of perceived stress levels with school management, it was noted that students belonging to private-unaided schools (47.5%) had higher stress levels in comparison with government and private-aided schools (29.5%) (OR = 2.16; 95% CI = 1.45–3.21; p <0.001). Enrolment in English medium schools was seen to be associated with higher stress. Among those in English medium schools, 36.6% had high stress compared to 24.5% in Malayalam medium schools (OR = 1.77; 95% CI = 1.10–2.86; p = 0.02). The stream of study was also noted to be an associative factor for higher perceived stress levels. Of the science stream students, 41.2% had higher stress levels, while 27.4% of commerce/humanities students were noted to have severe stress (OR= 1.86; 95% CI = 1.29-2.66; p = 0.001) (see Table 4).

A binary logistic regression was performed to determine the predictive ability of the categorical variables associated with the perceived stress level (see Table 5). After regression analysis, younger age, enrolment in the science stream, and better academic performance were significantly associated with higher stress levels. Spearman rank correlation analysis showed a significant positive

Table 5. Binary logistic regression model for perceived stress

Variable	aOR (95% CI)	P value
*Age (<17 years)	1.80 (1.23-2.63)	0.003
Education of father	0.79 (0.18-3.49)	0.75
Education of mother	0.66 (0.80-4.68)	0.14
School management (Private)	2.33 (0.53-10.35)	0.27
School syllabus (CBSE)	1.27 (0.75-2.13)	0.38
*Stream of Study (Science)	1.76 (1.20-2.57)	0.004
*Academic performance (≥50%)	2.62 (1.35-5.07)	0.004
Constant	0.162	0.009

aOR – adjusted Odd's ratio, CBSE – Central Board of Secondary Education; * – P value < 0.01

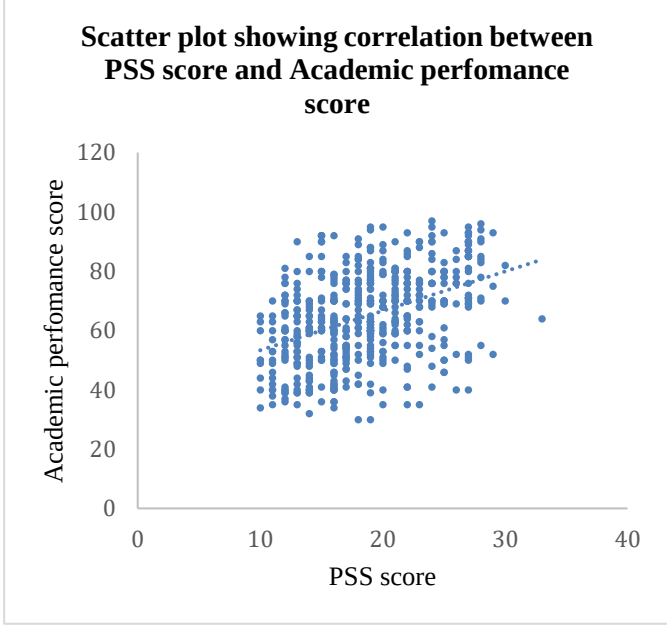
correlation between academic scores and perceived stress levels with moderate strength. (Correlation coefficient = 0.425; p <0.001) (see Figure 3).

Discussion

The current study attempted to evaluate the prevalence of perceived stress among higher secondary school students and explore various socio-demographic factors associated with it. Perceived stress was observed in 34.1 % of the participants, of whom 8.7% had severe stress levels. These observations were in accordance with the findings from previous literature.[21,23,24] The study also highlighted the possibility of academics being a stressor to the students. Unlike most of the previous literature observations, which showed more academic-related stress among the students who underperformed,[25,26] this study showed higher stress levels prevailing among the students with better academic performance. In a cross-cultural study, Crystal et al. (1994) observed a similar trend among American adolescents.[27] There are observations that the presence of worry about making mistakes in a test among high-performing students had indeed disrupted their performance.[28] High self-expectation, fear of failure and anticipation about the future, the pressure of fulfilling expectations of teachers and parents,[20] competitiveness, valuing oneself solely based on academic performance, career uncertainty, involvement in academic activities for longer periods and fewer engagements in leisure or social activities and self-doubt could be few of the several factors that might have contributed to this pattern of stress prevalence in academically typical students. The association of high stress levels with enrolment in a competitive stream of science,[29] private[30] and CBSE schools[31] could be considered a pointer to such factors.

Several studies provide ambiguous results when it comes to the association of stress with age, gender, and the residential and socioeconomic status of the participants. In this study, the stress levels were lower in participants of a higher age group. McGuire et al. (1987) observed a reduction in stress levels with higher grades.[32] Though a few studies describe the presence of high stress among girls compared to boys,[33,34] several studies observed no significant association with either sex.[35,36,25] This study also found no association between gender and perceived stress levels. Reiterating

Figure 3. Correlation between perceived stress score and academic performance



previous literature findings,[36,37] this study observed similar levels of stress among adolescents residing in urban and rural areas. The participants from a higher socioeconomic background showed higher stress levels than those from lower socioeconomic standards, but the result was not significant. Lower socioeconomic status is often noted to have a deteriorating impact on adolescents' development and mental health.[38]

While evaluating the factors associated with perceived stress, the family environment is as important as that of the school. Family dysfunction becomes a significant factor that determines the mental health of an individual.[39,40] In this study, students with fathers having higher educational status showed higher levels of perceived stress. Higher parental expectations[41] and the possibility of enrolment in academically competitive schools could be assumed to have a role in this association. On the contrary, educated mothers had shown an association with lower stress scores. Presumably, because they could provide stable support for adolescents, higher education equips mothers with a better understanding of their children's school life.[42] However, this finding showed no significant association when binary logistic regression was performed, signifying the possibility of confounders impacting the association.

Further studies are required to comprehensively evaluate the influence of parental education on the child's stress. A few limitations were identified during the research. The data were obtained only from the students, which could be subject to bias. When assessing perceived stress levels, the median score was compared to the score of 26, which denotes severe stress. This could have led to an overestimation of significant stress levels. As cluster sampling was applied for this study, homogeneity between the clusters cannot be ascertained. However, the authors have considered the design effect while estimating the sample size to minimize the precision errors.

Conclusion

The prevalence of perceived stress was seen in a significant proportion of the students, with academics being an unavoidable stressor. Academic performance, the course the students enroll in, and parental education are some factors associated with stress levels. Stress, when undetected and without any timely intervention, may lead to poor academic motivation in students and, later, to academic disengagement. The coping strategies and temperament of the students were not considered in this study. These could be a few factors that can be explored in the future, as addressing these would be beneficial in reducing the stress experienced by the students.

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