

Original Research Article

Level of stress perception and its predictors among school going Bengali late adolescents in a rural block of Eastern India

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ABSTRACT

Background: As adolescents are in transit from childhood to adulthood, they are vulnerable to stress and related complications. Measuring stress and its influencing factors is a prerequisite for developing strategy for this age-group. Objective of the study was to assess the level of perceived stress among school going late adolescents and to find out its predictors.

Methods: This cross-sectional analytical epidemiological study was conducted among the school going Bengali late adolescents (15-17 years) of a rural block of West Bengal, India within July 2017 to December 2017. Finally, 102 students of class IX and XI were selected via two stage simple random sampling method. Data were collected by interview using pre-designed, pre-tested, semi structured questionnaire including 10 points Cohen's perceived stress scale (PSS-10). Independent 't' test, ANOVA, Mann Whitney U and Kruskal Wallis H test were utilized to establish the association between independent variables and PSS score. Independent variables found to be associated ($p \leq 0.05$) were considered in multiple linear regression to identify the predictors of stress.

Results: Mean perceived stress score of participants were 16.8 ± 3.7 (mean \pm 2 SD) out of 40 (highest PSS score) with minimum and maximum score 8 and 26, respectively. In multiple linear regression, de-motivating comment, sibling pattern and love affair were found as predictors of stress perception among Bengali late adolescents. These factors collectively explained 15.6% variations of PSS score and individually contributed 3.8%, 5.6% and 6.2%, respectively.

Conclusions: Stress can be alleviated by arranging motivational programme, counselling, and life skill education.

Keywords: Late adolescent, Perceived stress, PSS scale

INTRODUCTION

Globally, 1.2 billion individual belongs to the age group 10–19 years.¹ A report of United Nations estimated that, the world had 721 million persons aged 12-17 and among Asia and the Pacific caters 432 million persons of this age group.² For every nation, adolescents are not only well populated, most targeted population also. In India 21% population are adolescent.³ In India, 15-19 years 9.9% female and 10.5% male (2015).⁴

Late adolescence (15 to 19 years) is most sensitive and vulnerable age group in everyone's life, because it gives

us foundation for future life. If it is not nurtured properly, future may be affected. Not only physiological changes, analytical ability also develops in this age group.¹ These bring a confidence among them about their own identity and opinions.¹ Their perception about life and surroundings started to change, they become more independent. As per Erikson, somebody go through identity crisis or role confusion in that age group.⁵ They are easily influenced by peer group opinions.¹ So, this phase of life is quite different from childhood or adulthood. Evolving social structure, life style, education system and many other factors make them more vulnerable to stress and related health problems. Depression is the third leading cause of illness and

disability among adolescents, and suicide is the third leading cause of death in older adolescents (15–19 years).⁶

Studies showed that there was some relation between perceived stress and risk of developing psychosomatic problem, sleep problem, depression.⁷ It varies adolescent to adolescent according to their coping ability. During coping somebody adopt different harmful life styles like addiction, careless sexual activity, binge eating etc. Thus, stress may affect future wellbeing of the adolescents as well as the community. By strengthening this psychologically vulnerable period of life, over all wellbeing of the nation can be enhanced, as they are the future of the country. There was very few data on stress perception and its correlates among rural adolescents and most of the studies were done in urban and high socio-economic background. So, this study was conducted to find out the level of stress perception and its correlates among rural adolescents.

METHODS

This institution based, cross-sectional, analytical epidemiological study was conducted on late adolescent of 15-17 years old, attending the schools of Gangajalghati block, Bankura district (West Bengal, India) within July 2017 to December 2017. Students who were 15-17 years, present on the day of data collection and were willing to participate were included as study population. Neuro-developmentally and physically challenged and chronically ill adolescents were excluded. Only higher secondary schools were included for the study. Students of classes IX and XI from same selected schools comprised the study population. Class X and XI were not considered in the study to annul the Board Exam's stress and the confounding effect of varied academic pressure in different schools. Total, 102 sample size was calculated by using 73.3% stress prevalence of and 10% non-response rate and 9% allowable error.⁸

Two stage simple random sampling procedure was adopted to obtain the study population. Out of 11 higher secondary schools of Gangajalghati, 6 (50%) were selected randomly. Total 51 students, each from Class-IX and Class XI, were selected for this study maintaining the overall sex ratio 1:1 for IX and 1.25:1 for XI. This sex ratio was commensurate with the overall gender-wise ratio enrolled for each class as per district Inspector's (education) record of Government H. S. Schools, Gangajalghati block (Figure 1).

After getting informed consent, data were collected by interview method assuring anonymity and privacy using the pre-designed, pre-tested, semi structured interviewer administered questionnaire including perceived stress scale (PSS). PSS is a 10 itemed scale scoring between 0-4 in each item. It's score ranges between 0 and 40 while higher score indicates more stress. Cohen, Kamarck, and Mermelstein (1983) reported Cronbach's α (reliability)

between 0.84-0.86 for the PSS in case of late adolescents. Correlation of the PSS to other measures of similar stress-symptoms ranges between 0.52-0.76 supports the validity of the scale (Cohen et al, 1983).⁹

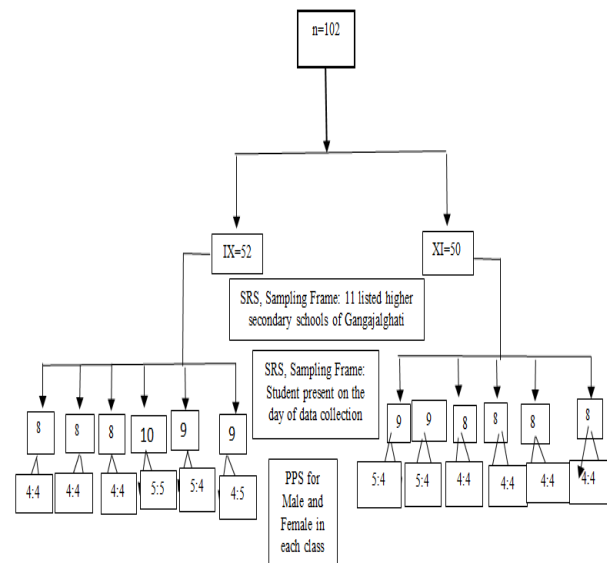


Figure 1: Diagrammatic representation of two stage simple random sampling method.

The study was started after getting approval from institutional review board (IRB) and district inspector of schools of Bankura district. Permission was also obtained from respective administrative/academic heads in charge of the selected schools.

Data were entered in Microsoft excel and perceived stress was assessed by mean \pm SD of PSS scale score. Normality test was done for checking of distribution of quantitative data. Bivariate analysis was done to calculate association between independent variables and PSS score by using independent t-test, Mann Whitney U test, one way ANOVA and Kruskal Wallis H test as applicable. Which independent variables were found statistically significant ($p \leq 0.05$) were considered for multiple linear regression to find out the predictors of perceived stress. The statistical software IBM SPSS 22.0 was used.

RESULTS

In the present study, mean age of 102 study subject was 15.6 \pm 1.7 years. Among them 52 (50.9%) were boys and 50(49%) were girls. About 53% students were found as general caste, 29.4% OBC and 17.6% SC and ST. 50% were from lower socio-economic class according to modified B G Prasad socio-economic status scale, 2016 (May) and 58% were belonging to nuclear family. It was found that 85.3% students shared their problem with others which include friends (47%), parents (24.5%), relatives and others (13.8%). In the present study, dependent variable i.e. PSS score is a quantitative

variable. The distribution of PSS score was checked by performing separate normality tests (a) for each category of each independent variable and (b) also as a whole for each independent variable. For independent variables, Levene's test was done to assess homogeneity of variance. Skewness and kurtosis value, histogram with distribution curve, Q-Q plot, Kolmogorov-Smirnov test and Shapiro-Wilk test were performed to check normality. PSS score was found normally distributed across the sample. In case an Independent variable had 2 categorical groups, data were representing the groups independently, and the dependent variable was approximately normally distributed for each such group of the independent variable and also had no significant outlier, then it was considered for Independent sample t test. If the data were not normally distributed in above situation, Mann Whitney U test was done. In case of Mann Whitney U test, shape of the distribution for each group of the independent variable was checked. Where shapes were similar or identical, the median values of 2

groups were compared, while for different shape distributions mean ranks were compared. Where Independent variable had 3 or more categorical groups, data were representing the groups independently, dependent variable was approximately normally distributed for each group of the independent variable and had no significant outlier, considered for one way ANOVA test. Bonferroni post hoc test were done to identify the pair of group(s) which were actually differ with each other and ultimately contributed overall statistical significance difference in one way ANOVA test. If the data were not normally distributed in above situation Kruskal Wallis H test was applied. Median values were used for the comparison where distribution shapes of different groups were similar or identical and mean ranks were used for different shape distributions. Which independent variables were found statistically significant ($p \leq 0.05$) in bivariate analysis, were considered for multiple linear regression to find out the predictors of perceived stress.

Table 1: Distribution of school going late adolescents according to socio-demographic variables and their relationship with PSS score.

Variables	Category	Frequency No. [%]	PSS score (mean ±SD) or mean rank	Test of significance
Age	-	-	15.6 ± 1.7 (mean ± SD)	Pearson's correlation: R=0.088, p=0.378
Gender	Male	52 (50.98)	17.7±3.8 (mean ± SD)	T=2.561, df=100, p=0.012*
	Female	50 (49.01)		
Class	IX	52 (50.98)	Mean rank 47.8	U=1106, p=0.192
	XI	50 (49.01)	Mean rank 55.4	
Caste	General	54 (52.94)	52.2	X ² =1.608, df=2, p=0.448
	OBC	30 (29.41)	46.7	
	SC and ST	18 (17.65)	57.6	
Type of family	Nuclear	59 (57.84)	Mean rank 54.01	U=1120.5
	Joint	43 (42.16)	Mean rank 48.06	P=0.314
SES	Class I+II	11 (10.78)	Mean rank 79.1	X ² =13.960 Df=3 P=0.003*
	Class III	12 (11.76)	Mean rank 62.2	
	Class IV	28 (27.45)	Mean rank 46.3	
	Class V	51 (50)	Mean rank 45.9	
Sibling pattern	No sibling	17 (16.66)	18.7±3.8	F=2.648 P=0.050*
	Male predominant	20 (19.61)	16.4±2.4	
	Female predominant	26 (25.49)	15.6±3.5	
	Equal	39 (38.24)	16.9±4.1	

Gender, socio-economic status, sibling pattern, argument with parents, de-motivational comments and love affairs were found statistically significant in bivariate analysis. These independent variables and dependent variable (PSS score) were chosen for correlation matrix to see the direction and magnitude of correlation and inter relationships among the dependent and independent variables. Statistically significant categorical variables were transformed to dummy variables. Among the all categories of independent variable which one is explaining the output, was coded with 1 and rest of the categories were coded as 0.

In correlation matrix ultimately sibling pattern, de-motivational comments and love affairs were found statistically significant with PSS score by partial correlation. Ultimately these 3 independent variables were selected for multiple linear regression models. Linearity and multivariate normality also checked for the model. After fulfilling all the assumption multiple linear regression was done.

In multiple linear regression, 15.6% variation of PSS score is explained by affair, sibling pattern and demotivating comment. Out of total variation, de-

motivating comment alone contributed 3.8% (15.6%-11.8%) and sibling pattern and affair individually explained 5.6% (11.8%-6.2%), 6.2% (11.8%-9.4%) respectively.

$y=15.433+1.529$ demotivating comment+ 2.322 Sibling pattern+ 2.671 affair.

Table 2: Distribution of school going late adolescents according to parenting, academic activities and personal issues.

Variables	Category	Frequency	PSS score (mean ±SD) or mean rank	Test of significance
Parenting	Both parents	90 (88.24)	16.7±3.6	F=0.310 P=0.734
	Others	8 (7.84)	17±5.6	
	One parent	4 (3.92)	17.8±3.7	
Beating	Always and often	4 (3.92)	Mean rank 46.5	X ² =0.242 df=2, p=0.886
	Sometimes	21 (20.59)	Mean rank 49.7	
	Never	77 (75.49)	Mean rank 52.3	
Parental disharmony	Always and often	4 (3.92)	19.7±3.3	F=2.842 P=0.089
	Sometimes	33 (32.35)	17.4±3.67	
	Never	65 (63.73)	16.2±3.7	
Parental pressure for study	Always	26 (25.49)	17.8±4.8	F=0.955 P=0.417
	Often	40 (39.21)	16.4±3.5	
	Sometimes	5 (4.91)	17.4±3.8	
	Never	31 (30.39)	16.4±2.8	
Argument with parents for day to day activity	Always and often	6 (5.89)	20.5±3.87	F=3.994 P=0.021*
	Sometimes	14 (13.72)	15.6±4.3	
	Never	82 (80.39)	16.7±3.5	
No. of days in a week for tuition			16.8±3.7	P=0.073
Marks	<60%	66 (64.71)	16.5±3.4	F=2.067 P=0.132
	60–80%	35 (34.31)	17.6±4.3	
	>80%	7 (6.86)	14.9±1.9	
Love affair	Present	85 (83.33)	16.4±3.6	T=-2.561 df=100, p=0.012*
	Absent	17 (16.66)	18.8±3.9	
De-motivational comment	Always and often	6 (5.89)	20.2±4.9	F=2.871 P=0.016* F=2.871
	Sometimes	28 (27.45)	17.5±3.4	
	Never	68 (66.66)	16.2±3.6	
Body image	Satisfied	87 (85.29)	51.39	U=642.5 P=0.924
	Not satisfied	15 (14.71)	52.17	
Communication with opposite sex	Easy	90 (88.24)	48.18	X ² =2.628 df=2, p=0.269
	Not easy	8 (7.84)	55.11	
	Difficult	4 (3.92)	61.00	

(p<0.05).

Table 3: Correlation matrix showing partial correlation among independent variables and with PSS score.

	PSS score	Sex	SES	Sibling pattern	Demotivating comment	Affair
PSS score	1.000	0.158 (0.057)	0.055 (0.290)	0.184 (0.032*)	0.235 (0.009*)	0.248 (0.006*)
Sex		1.00	0.278 (0.002*)	0.333 (0.000*)	0.153 (0.063)	0.175 (0.039*)
SES			1.00	0.053 (0.000*)	0.223 (0.012*)	- 0.071 (0.240)
Sibling pattern				1.00	0.019 (0.426)	-0.200 (0.022*)
Demotivating comment					1.00	0.130 (0.096)
Affair						1.00

() denotes p value, *denotes p value <0.05.

Table 4: Multivariate linear regression model for predictors of perceived stress.

Model no.	R	R ²	Adjusted R ²	Standard. error of the estimate	F	Significant
1.	0.248a	0.062	0.052	3.614	6.557	0.012
2.	0.344b	0.118	0.101	3.521	6.382	0.013
3.	0.395c	0.156	0.134	3.463	4.336	0.040

a=(constant), affair, b=(constant), affair, sibling pattern, c=(constant), affair, sibling pattern, demotivation, Durbin-Watson=1.705, Dependent variable =PSS score.

DISCUSSION

This study revealed that sibling pattern, demotivating comment and love affair collectively explained the 15.6% variation of PSS score. Mean PSS score 16.8 ± 3.7 (2 SD) was quite low in this study as compared to other studies.¹⁰⁻¹² It may be due to rural socio-economic condition and life style differs from urban area. But similar findings were observed by a study conducted in both rural and urban area of Uttar Pradesh.⁸

The range of perceived stress in this study was 8 and 26 which was different from a study done in Delhi using another scale score range (0-40).¹⁵ In another study of India, conducted in urban set up using 14 point PSS scale, wide ranged PSS score (4-43) was found.¹⁰

In the present study, it was found that of 51% students come from lower socio economic status and 59% from nuclear family which were not statistically significant with PSS score and this is collaborative observation with a study of Maharashtra.⁷

Mean perceived stress score for male and female were 17.7 ± 3.8 and 15.8 ± 3.4 respectively and it was not statistically significant, as found in Karnataka and Haryana Study.^{14,10} One study in Europe (HELENA) found that, girls reported systematically higher levels of stress compared with boys, their stress profiles were similar, with highest levels for school-related stress followed by future uncertainty.¹⁵ Another study in Sweden found that, from all of the stress variables, girls had significantly more perceived stress than boys.¹⁶

Those who don't have sibling had more stress (18.7 ± 3.8). It may be due to parental expectation is more for single child and they expect all of their dream will be fulfilled by their child. As a single person it becomes unbearable and tough to reach their expectation level and it leads to more stress among single child. There is no such difference whether the subject has more number of brothers or sisters, on mean PSS score. So, gender biasness not an issue for adolescent stress perception. A study from Karnataka, revealed that adolescents with less number of siblings do not differ significantly in their stress experience than more number of siblings.¹⁴

Though Wiklund et al found significant association between parents' related factors (physical violence,

interpersonal relation and pressure for study) and stress, but here no significant association was found.¹⁶ This study found that, those who did not receive demotivating comment had mean PSS score 16.2 ± 3.6 which is less than the scores 20.2 ± 4.9 and 17.5 ± 3.4 , of those who received demotivating comment always-often and sometimes respectively. Over all 3.8% variation of PSS scores were explained by demotivating comment. One finding in this respect that the source of this type of comments were parents, relatives, neighbours i.e. persons from the residence and surrounding environment. Motivation is not only the key to success but also alleviator of stress. So, it can be said that in this transition phase of life, adolescent need more motivation from their surroundings as well as from community.

Majority of students (83.3%) don't have affair but who are in relationship feel more stress (18.8 ± 3.9) as compared to those who don't have affair (16.4 ± 3.4). It may be due to the fact that they are not mature enough to handle love relationship or from family pressure. As being in relationship in this age not accepted by our society, they try to hide which can give extra perception of stress. This is supported by another study review.¹⁷

Cultural belief and educational structure of this rural society refrained us from exploring the issues like pubertal changes among adolescents, history of sexual abuse etc. Though another study found that stress had positive effect on academic achievement, but this study revealed that academic pressure was not the stressor for those rural adolescents.¹⁰

CONCLUSION

As this study revealed that love affair, sibling pattern and de-motivational comment makes rural adolescents feel stressed, future studies should be done in depth for these issues. Moreover the study finding along with existing literature will help in better understanding of adolescent's stress. The problems can be mitigated by improving the communication and relationship between parent-teacher, student-teacher and also by life skill education.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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