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Abstract

Objective: To identify the risk factors of stress among school-going adolescents in rural Nawabshah, Pakistan.

Methods: The cross-sectional study was conducted in 2005, comprising 800 school-going children of 10-16 years of age in Nawabshah, through simple random sampling. Data was collected using a structured questionnaire to assess the potential risk factors of stress. A modified version of Perceived stress scale was utilized to measure stress level. SPSS 12 was used for statistical analysis, while multiple linear regression analysis was run to identify the factors associated with stress in the study population.

Results: Of the total, 529 (66%) children belonged to state-run schools while 271 (34%) were studying at private facilities. The mean age was 13.7±1.3 years. The level of stress was positively associated with the number of siblings, parental conflicts, the age of the mother and the number of rooms in the household. There was decreased level of stress among female adolescents (n=474; 59.3%) who had prior information about pubertal body changes than the boys (n=326; 40.8%).

Conclusion: The study showed that stress among adolescents can be reduced by modifying socio-economic and demographic factors.

Keywords: Stress, Adolescence, Mental disorders, Associated factors of stress. (JPMA 62: 1209; 2012)

Introduction

An adolescent is defined as an individual whose age is between 10-19 years and it is considered to be the most critical time for the prevention of mental illness.[1] There are over 176 million individuals in Pakistan, and about 20% of them are adolescents.[2] Mental healthcare has been one of the most neglected areas in Pakistan considering the lack of awareness and the stigma attached to seeking appropriate treatment.[3]

Adolescence in this period face challenges while forming meaningful relationship, identity and locating personal directions, and often end up with stress.[4] This might stimulate either new adaptive coping or maladaptive response and unhealthy lifestyle.[5]

Stress in adolescents is a consequence of personal, environmental and social factors. Personal factors include perception of stress, interpersonal conflict, coping response and prior knowledge of puberty and cultural norms for handling stress.[6-10] Environmental factors include home and community situation, type of school, violence, crowding, noise and barriers to health services.[6-10] Among social factors, social support, parental support, parental education, parental psychological problems, poor monitoring and inconsistent discipline are strong predictors for adolescent psychological health outcomes.[6-11] Many mental disorders initiate in adolescence. If left unidentified and untreated, these conditions may lead to some chronic mental illness in adulthood.[3,12]

High prevalence rates of anxiety, depression, and mental and behavioural disorders have been found among adults in Pakistan.[13] Adolescent mental health issues in the country have remained a fairly neglected area of research.

The emerging consensus in the literature clearly indicates that the population of adolescents will increase with time and this particular age group is more prone to negative health outcomes due to stress that does not only lead to physical illness, but also behavioural and psychological maladjustment. This analytical cross-sectional study uncovered the factors associated with stress among school-going adolescents in Nawabshah city, Pakistan. The identification of risk factors associated with stress can assist caregivers to formulate preventive strategies for stress among Pakistani adolescents.

Methodology

The cross-sectional study was conducted in 2005 in

Nawabshah, which is located in the center of the province of Sindh, Pakistan. The study population comprised school-going adolescents of 10 to 16 years of age.

According to the World Health Organisation (WHO), adolescence is the period from age 10 to 19 years. In Pakistan, the school-going age till grade 10 is maximum 16 years, and since this was a school-based study, therefore, we selected the participants of that group. Adolescents who had physical or cognitive disabilities, as identified by class teachers, were excluded.

Approval of study protocol was obtained before the data-collection process from Aga Khan University, Karachi campus' ethical review committee. Of the 27 secondary schools in the study area, 18 agreed to participate. Of these 18 schools, 6 (33%) were public and 12 (67%) were private schools. Enrolment of students in these schools varied from 500 to 3000 students. Simple random sampling was employed to select the number of study subjects through school registration list using SPSS version 12.0. The participants of schools which provided the permission, were requested to provide the list of all adolescents aged 10 to 16 years present on their rolls. The final list comprised 4480 students. Each student was assigned a number, then based on computer-generated numbers, a list of 800 students was selected. Only five students refused to participate when the researchers approached them. They were replaced by the another set of five students from the list through the same procedure.

To identify the factors associated with stress, the sample size for the most important factor, gender, was estimated. By having the significance level of 0.05, odds ratio of at least 2, and a power of 90%,[14] we needed a sample of 600 for the identification of gender as a risk factor. The sample size was further inflated by 30% to account for non-responders. The final study subjects were interviewed to achieve the study objectives.

A structured questionnaire was used for data collection about socio-demographic characteristics and potential risk factors related to stress. The questionnaire gathered information about age, number of rooms, family type, housing condition, number of siblings, parental age, parental educational status, parental employment status, smoking status, financial issues, parental quarrel, parental sickness, and prior information regarding puberty.

A modified version of the Perceived Stress Scale (PSS) was used to measure stress level.[15] The total score on PSS was taken as the sum of score for all the 14 items. The PSS 14-item instrument has established reliability and validity (r=0.85). There are no cutoff values as it is not a diagnostic instrument. The higher the degree and longer the duration of self-perceived stress, indicated by a higher score, is considered a risk factor for a clinical psychiatric disorder.[16]

In the original scale, the subjects' responses are measured on a five-point scale (0 = never, 1 = almost never, 2=sometimes, 3 = fairly often, 4 = very often). However, in the modified scale, the questions were measured on a three-point scale (1 = never, 2= sometimes, 3 = often). The modification of this scale was performed by a group of expert psychologists to establish the content or face validity. The scale has been modified according to comprehension of adolescents as per Pakistani cultural context.

The modified stress questionnaire was subsequently pilot-tested among a sample of 60 adolescents at two schools of Tando Allahyar city, Pakistan. The purpose of the pilot study was to evaluate face and content validity of the questionnaire and identify any ambiguity. Respondent comments from the pilot study were used to make changes to the questionnaire.

The researcher met the parents of all the randomly selected adolescents. The purpose was to explain the study objectives and to obtain verbal and written consent. On the day of data collection, the students whose parents had consented to participate were interviewed in privacy. Before the interview, the participants were briefed about the study and verbal informed consent was obtained.

Data analysis was performed using SPSS version 12.0. The mean and standard deviation were computed for continuous variables and frequencies and percentages for categorical variables. The score of PSS was taken in a continuous form and it ranged between 14 to 42 scores. Linear regression method was performed; the beta coefficient (the mean estimated change in the stress score with a unit change in predictor variable) and 95% confidence intervals were estimated to evaluate the effect of each predictor variable with the stress score (Figure).

Results

Of the total, 529 (66%) subjects were from public, and 271 (34%) were from private schools (Table-1). The mean age of the respondents was 13.7±1.3 years with a median of 13. The mean of PSS score of the respondents was 26.7±3.3 with a median of 27. The mean number of rooms in the respondents' house was 3.8±2.0 and 654 (81%) of the adolescents did not have a separate room. The average number of siblings within a family was 4.6±2.4. The mean age of the mother was found to be 49.1+6.6 years. Only 392 (49%) had information about body changes prior to puberty. Most of the male adolescents had got information from friends and father; while female adolescents were provided pubertal information by mothers and sisters. With respect to the stressful conditions in their

Table-1: Demographic and socio-economic characteristics.

Characteristics	n (%)
Age Mean	13.7±1.3
Gender	
Male	326(40.8)
Female	474(59.3)
Type of School	
Private	529(66.1)
Government	271(33.9)
Perceived Stress Scores	
Mean ±SD	26.7±3.3
Number of rooms (Mean)	3.8±2.0
Possession of a separate room	
Yes	146(18.2)
No	654(81.8)
Mean Age of Mother (Years)	41.9±6.6
Informed about pubertal body changes	
Yes	392(49.0)
No	408(51.0)
Financial issues	
Yes	244(30.5)
No	556(69.5)
Parental quarrel	
Yes	181(22.6)
No	619(77.4)

lives, 244 (31%) subjects reported stress related to financial issues, and 181 (23%) reported about parental quarrel.

The statistical significance of the assumptions and predictors with mean stress scores was checked out through multiple linear regression analysis (Table-2). The final model indicated that 23% of the variability in the mean stress scores was explained by gender, number of siblings, number of rooms, parental quarrel, type of school, age of mother, and an interaction between prior information regarding puberty and gender. Although variable information regarding pubertal body changes prior to puberty had p-value greater than 0.05, but it served as a confounder. Therefore, it was kept in the model for further analysis.

Only one statistical interaction between gender and information regarding pubertal body changes prior to puberty (p<0.001) was found to be significant and kept in the model. The final model indicates that with every one-sibling increase in family, the mean estimated stress score increased by 0.120 (95% CI: 0.026, 0.215). Adolescents who were surveyed at private schools were at increased risk of stress (adjusted beta: 0.956, 95% CI: 0.501, 1.412) compared to those at public schools. As the age of mother increased by one year, the mean estimated stress score decreased by -0.051 (95% CI:-0.087, -0.015). Moreover, with one-number increase of a room in house, the mean estimated stress score decreased by -0.201 (95% CI: -0.317, -0.085). Among adolescents' home environment where there is parental quarrel, the mean estimated stress score increased by 0.158 compared to adolescents whose parents do not quarrel (95% CI: 0.057, 0.259). The model also indicated that with every one-sibling increase in family, the mean estimated stress score increased by 0.120 (95% CI: 0.026, 0.215). There is an interaction between prior discussion to puberty and gender. Among female adolescents who had prior discussion about puberty, the mean estimated stress score decreased by -1.312 (95% CI: -2.218,-0.406). However, among male adolescents who had prior discussion about puberty, the mean estimated stress score was 0.524 (95% CI: -0.173, 1.258) that was not

Table-2: Multivariable Analysis of factors associated with stress.

Characteristics	β (SE (β))	95% CI	P-value
Type of school	-	-	
Government	0.956(0.23)	0.501, 1.412	-
Private			0.001*
Age of mother	-0.051(0.01)	-0.087, -0.015	<0.001*
Number of rooms	-0.201(0.05)	-0.317, -0.085	<0.001*
Parental quarrel			
No	0.158(0.05)	0.057, 0.259	-
Yes			0.002*
Total number of siblings	0.120(0.04)	0.026, 0.215	0.013*
^Prior information about puberty and Gender			
Male			
Prior information about puberty	0.524(0.36)	-0.173, 1.258	0.137
No prior information about puberty	-	-	-
Female			
Prior information about puberty	-1.312(0.46)	-2.218, -0.406	<0.001*
No prior information about puberty	2.344(0.39)	1.575, 3.114	<0.001*

Adjusted R2 =0.225, ?0 = 27.843, F = 30.063.
^ The interaction term was added to the model.
βeta coefficients and their confidence intervals were calculated by fixing the information about puberty and taking the no prior information as the reference i.e. the male who didn't prior information about puberty.

Histogram
Dependent Variable: DEPEND

Std. Dev = 1.00
Mean = 0.00
N = 800.00

Normal P-P Plot of Regression Standardized Residual Dependent Variable: DEPEND
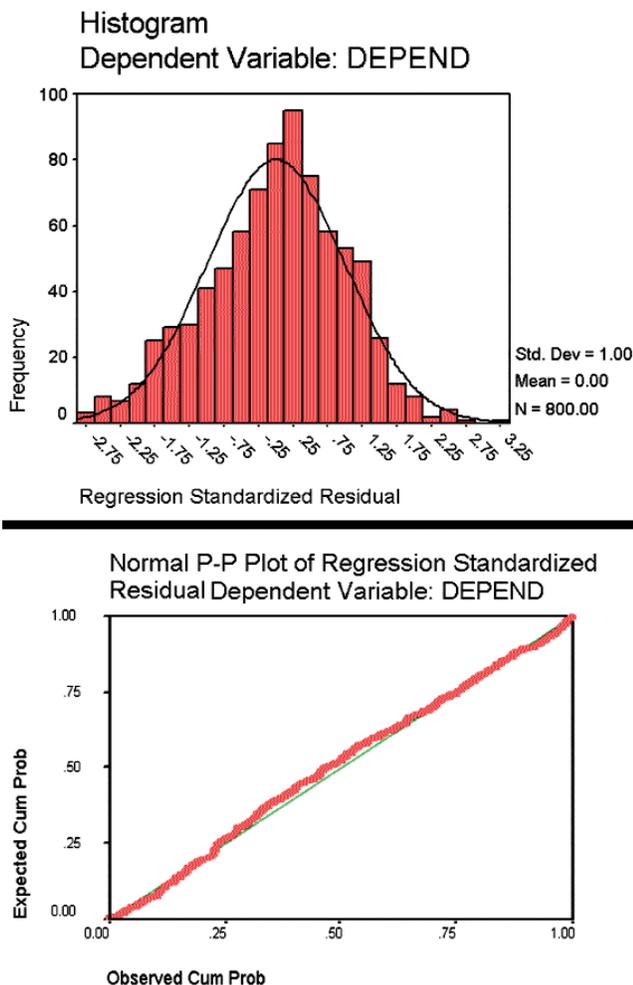

Figure: Model Adequacy checks.

significant and showed no effect of prior information about puberty for male adolescents. So at the two levels of gender, the effect of prior discussion about puberty on stress was different or modified, highlighting the interaction term.

Discussion

This is the first report of a school-based study in Pakistan to identify the associated factors of stress among school-going adolescents in Nawabshah with a response rate of 100%. This study showed that number of siblings, number of rooms, parental quarrel, type of school, age of the mother, and an interaction between prior discussion regarding body pubertal changes and gender were significantly associated with stress in this population.

The level of stress among school-going adolescents was alarming, and was higher among private-school adolescents than the public-school subjects. The type of school was found to be an important risk factor of stress.

The young student population has always been vulnerable to stressful conditions, especially in pursuit of higher professional education in a high competitive environment.[17] The present study also found that the age of mother was an important predictor of stress compared to adolescents with younger mothers. It was likely to occur because older mothers tend to have more knowledge about the rearing of children.

Number of rooms was taken as proxy to assess socio-economic status and it was found to be an important predictor of stress in our study. It was evident from the results that increased number of rooms had inverse relationship with the risk of stress. Previous studies have also shown that lower socio-economic conditions lead to depression among individuals.[18]

Parents are the significant stakeholders in the lives of young people in Pakistan. They play a critical role for their children and pass on essential information and life skills.[19] Parental quarrel was a significant risk factor for stress in this study, which was consistent with a previous study.[7] Information regarding parental quarrel was captured by asking study participants about stressful conditions as an open-ended questions. It is likely that we could have got more adolescents reporting about parental quarrel if we added specific and close-ended question about this issue in the questionnaire.

There was a dose-response relationship between the number of siblings and level of stress in our study. On the other hand the adolescence with more siblings have shown significantly higher self-confidence levels than those with less siblings.[11]

The present study found a significant association of gender with stress. Among the total number of stressed subjects 78% of the girls were at a higher risk of stress compared to the boys. One of the reasons for higher level of stress among female adolescents in our study was the socio-cultural environment of the girls; a result which is in line with available literature.[20]

In the final model, there was significant interaction between gender and prior information regarding puberty. Among informed adolescents prior to puberty, 57% were males compared to 43% females. A report from WHO also suggests that often female adolescents lack knowledge about sexuality and reproduction and are unprepared for the physical and emotional changes that take place during this period of life.[21] The reason for the lack of information among female adolescents may reflect the way girls are raised, which involves resistance to openness for discussion of these topics in the family, in addition to lack of educational programmes at schools and at health services. Men have also acknowledged their lack of information on reproductive health issues and

have expressed a need for more information.[22]

However, to our knowledge from indexed literature, this is the first research study that has assessed the association between stress and prior information about pubertal body changes among adolescents in Pakistan. Our study findings indicated that prior information regarding puberty did not influence the level of stress of the male adolescents, while for female adolescents, the information about pubertal event affects the level of stress to a greater extent. The reason for this difference between pubertal information, gender and level of stress needs to be further explored.

Important factors associated with stress - such as housing condition, and financial issues - were assessed, but no relationship was established between these predictors and stress because of their low prevalence in Nawabshah.

The outcome stress was assessed through PSS. Though the current investigation did not include validation of the scale, yet content validity was established through expert psychologists' opinions. Our study was based on self-reported perceived stress information. Therefore, another limitation of the study was that we could not make psychometric validation of self-reported level of stress of each study participant. This might have underestimated or overestimated the risk of stress in our study.

Adolescents might have responded negatively to the items of PSS because of social stigma that is attached to mental illness. This was a cross-sectional survey, so inferences could not be drawn about causality of association. Moreover, temporality of the associations between the independent variables and outcome cannot be inferred from this study design.

Conclusion

As the results showed, total number of siblings, number of rooms, type of school, mother's age, and parental quarrel are significantly associated with stress. By devising public health interventions and addressing the identified risk factors, adolescents can be prevented from getting into psychological morbidity, mortality and disability.

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