

Original article**Self-esteem as a protective factor against adolescent psychopathology in the face of stressful life events**

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Abstract

Background: Adolescence is a period of transition, characterized by changing life events. Stressful life events impact the psychological health and quality of life (QoL) of adolescents. It is therefore critical to identify factors that protect adolescents from these stressors to inculcate resilience. The study aimed to explore the nature of life events experienced by adolescents, gender differences in life events, determine their association with psychological health, quality of life, and to investigate the potential protective role of self-esteem.

Method: A quantitative, cross-sectional research design was chosen on a sample of 500 higher secondary school students. Life events were measured using the Child and Adolescent Survey of Experiences Scale (CASE). Depression, anxiety, self-esteem, and health related QoL (HRQoL) were assessed using Kutcher's Adolescent Depression scale, Screen for Child Anxiety Related Disorders, Rosenberg Self-esteem scale, and KIDSCREEN-10 respectively.

Results: Adolescents experienced significantly more positive life events. There were no gender differences in the experience of positive or negative life events. Depressed and anxious adolescents experienced significantly more negative life events. Self-esteem was the most

significant factor that impacted adolescent QoL and protected against depression and anxiety when compared to life events in multiple regression analysis.

Conclusion: Self-esteem is an important factor that buffers the negative effect of stressful life events in adolescence. It can serve as a target for the prevention of negative health outcomes as well as for optimal adolescent development.

Keywords: Adolescence, life events, self-esteem.

Introduction

Adolescence is a unique transitional period, when a teenager gradually grows and matures by accepting adult roles and responsibilities. It is a unique developmental stage during which an individual experiences life changes not previously encountered. These life events impact all aspects of the adolescent's biopsychosocial functioning. Adolescents experience life events that are as stressful as those experienced by an adult, which adversely impacts their physical and mental health [1]. However, not all adolescents exposed to negative life events are affected by them. This resilience to adversity has lately been subject to scientific research as it provides an insight into factors that buffer the negative effects of stress while providing an opportunity to investigate the role of social environment in the genesis of psychopathology [2].

Self-esteem is an important psychological component of resilience. High self-esteem has been associated with optimal physical and psychological health, better quality of life, overall life satisfaction, happiness, academic achievement, job satisfaction, and positive coping [3]. Low self-esteem on the other hand is associated with a range of externalizing (substance abuse, aggression, violence, youth delinquency, school dropout, and high risk behaviors) and internalizing behaviors (depression, suicidal behavior, anxiety and eating disorders) [3].

Investigating the role of life events in adolescent psychopathology is of utmost importance especially in the state of Sikkim. Despite being the least populous (just over 6 lakh population, 2011 census) and the second smallest state (after Goa), Sikkim has done remarkably well, being the first state to practice 100% organic farming and achieve 100% sanitation for all its citizens. However, the state is also making news in recent times for having the highest suicide rates in the country with a rate of 37.5 per million population (National average 10.6 per million) in 2015 [4]. In an unpublished study by Hajra A, adolescents are increasingly been evaluated in the emergency services of the tertiary referral medical college hospital of Sikkim for deliberate self-harm, para-suicidal behavior, and suicidal attempts precipitated by relationship problems, academic failures, and domestic difficulties [5].

The Government of Sikkim has tirelessly been coordinating with all the concerned stakeholders in promoting positive mental health among school children in an effort to improve their well-being. Hence, this study assumes special significance in providing scientific information on the extent of the stressful events faced by adolescent students and its impact on their mental and physical well-being. This can enable preventive measures to be implemented at the school level. The study aimed to assess the nature of stressful life events faced by adolescent students. The objectives were to measure these life events, investigate gender differences, and determine its association with psychological health and quality of life. Finally, the potential protective role of self-esteem on the psychological health and quality of life (QoL) among students was investigated.

Method

The research protocol was cleared by the Institutional Ethics Committee. A quantitative, cross-sectional research design was chosen to address the objectives. Sample size was calculated using

the formula $n = \frac{Z^2 p q}{e^2}$. Z is the standard normal variate which was fixed at 5% type 1 error ($Z=1.96$) for our study. p is the expected proportion of the adolescent population showing depression. This was chosen at 30% based on a literature review of adolescent depression in our setting [5]. e is the precision error and was fixed at 5%. Using this formula, we calculated an adequate sample size to be about 323 students. Assuming only 70% of the participants would consent, we estimated that our target sample should be at least 460 students. The study was conducted in one private and one public school on students of class XI and XII (higher secondary). We wanted to include a private and public school to get a better representation of students across class distributions. Higher secondary students were chosen as it was the experience of one of the authors from a previous study that students in secondary school could not accurately fill up self-report questionnaires [6]. A convenience sampling method was chosen in the selection of schools. The school management was presented with the details of the study. Written informed consent was obtained from student and parents. Confidentiality of all data including responses to the questionnaires was assured. The school teachers and faculty were not made privy to the questionnaire responses. Questionnaire administration was completed in two sessions of 40 minutes each. An investigator (UNG) was available at the time to clarify any doubts. The following rating scales were administered to the students:

Socio-demographic data: age, gender, and presence of siblings were recorded.

The Child and Adolescent Survey of Experiences (CASE): It provides a measure of positive and negative life experiences of relevance to children and adolescents [7]. The impact of 38 life events are scored on a 6 point Likert scale from 1 (really good) to 6 (really bad) if they had occurred in the past year. Life events were scored positive if the adolescent scored the event as *a little good, quite good or really good*. Life events were scored as negative if the experience is

rated as *a little bad*, *quite bad*, or *really bad*. Based on whether the life events were dependent or independent of the adolescent's behavior, the CASE divides life events as dependent and independent respectively. Thus, the CASE scale yields 6 composite scores: total positive, total negative, dependent positive, dependent negative, independent positive, and independent negative life events. The scale has been shown to have satisfactory psychometric properties in community, clinical samples and associations with other interview-based measurements [8,9].

The Kutcher Adolescent Depression Scale (KADS) was used to assess levels of adolescent depression [10]. In this study, KADS-6 item and KADS-11 item versions were used. The 6 item version was used to screen for adolescent depression with a cut-off score of 9, yielding a sensitivity of 69% and specificity of 90% [11]. The scale has acceptable reliability and validity [12]. The 11 item version (KADS-11) has good psychometric properties and was used in this study to rate the severity of depressive symptoms [13].

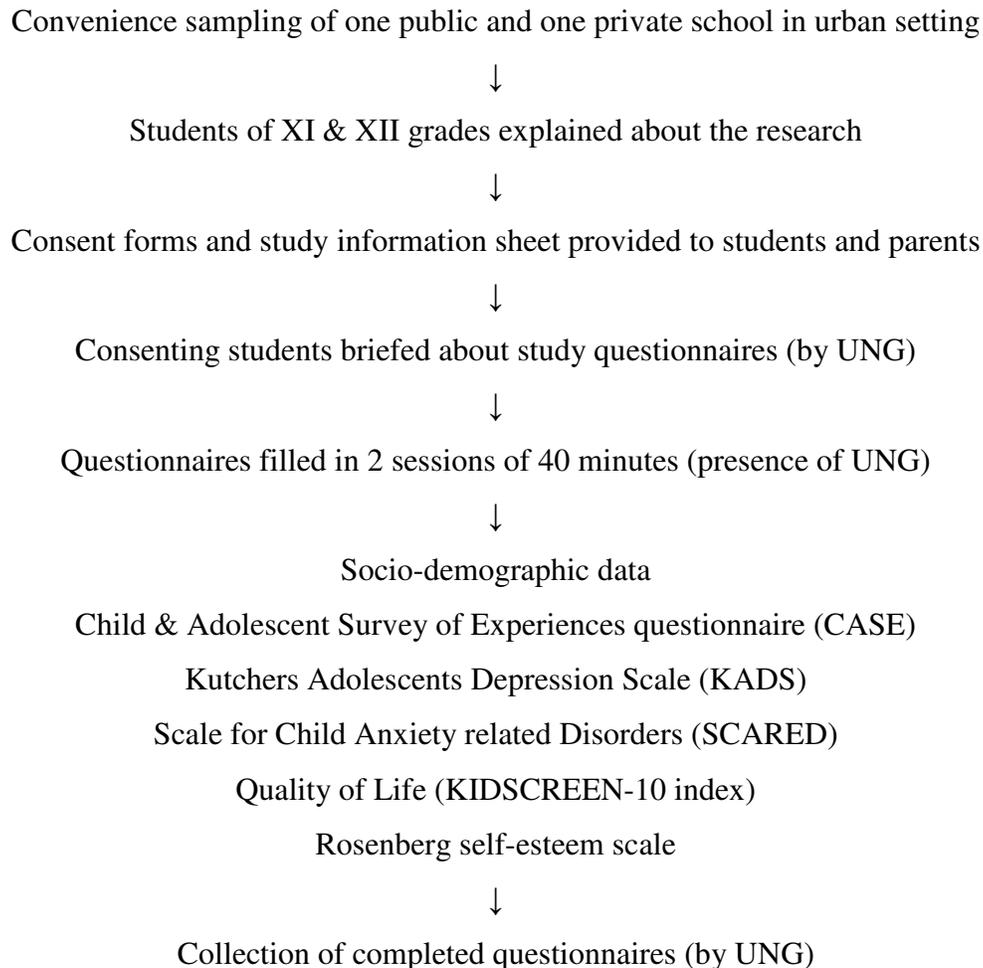
The Screen for Child Anxiety Related Disorders (SCARED) is a self-report scale used to assess childhood and adolescent anxiety disorders. The SCARED scale demonstrates good internal consistency ($\alpha=0.74$ to 0.93), test-retest reliability (intra-class correlation coefficients= 0.70 to 0.90), and discriminant validity (both between anxiety and other disorders and within anxiety disorders), and it is sensitive to treatment response [14]. A cut-off score of 30 was taken to diagnose anxiety disorder among the students which yielded a sensitivity of 60.6% and specificity of 83.5% [15].

The KIDSCREEN-10 assesses health-related quality of life (HRQoL) in children and adolescents [16]. Each item is answered on a 5-point Likert scale with higher values indicate better HRQoL. The raw scores are summed and Rasch person parameters (PP) assigned to each possible sum score. The PPs are then transformed into values with a mean of 50 and a standard deviation (SD)

of approximately 10 [17]. Higher scores indicated better HRQOL. The scale possesses good internal consistency reliability (Cronbach's $\alpha=0.82$) and test-retest reliability ($r=0.73$; $ICC=0.72$) [18].

The Rosenberg self-esteem scale (RSES), a widely used instrument to measure self-esteem was used in this study. The RSES demonstrates good internal consistency, test-retest reliability, concurrent, and predictive validity while correlating with other measures of self-esteem [19]. The scale has been validated in adolescents [20].

Flowchart of methodology



Data analysis was performed using MINITAB 17 statistical software [21]. Statistical significance was taken at a p value of < 0.05 . Life event categories (positive, negative, dependent and independent) were not normally distributed in the sample and hence non-parametric tests were used for analysis. Spearman's rank order correlation was used to measure the association of life event categories with adolescent depression, anxiety, HRQoL, and self-esteem. Mann-Whitney U test was used to compare differences in life event categories among socio-demographic and clinical variables. Multiple linear regression analyses were performed to quantify the impact of life event categories and self-esteem (predictor variables) on adolescent depression, anxiety and HRQoL (response variables). Students who screened positive for depression and anxiety disorders were asked to avail the psychiatric services of our department through their parents.

Results

The study sample consisted of 500 students. The mean age of the sample was 17.32 (SD=1.34) years with 54.8% being boys. Majority of the sample belonged to a nuclear family (74%). Only 9.8% of the students did not have any siblings while most of the samples had one or more siblings (90.2%).

Mann-Whitney test was used to find the differences in life event categories. Total positive life events (median=13) were significantly greater than total negative life events (median=12, $U=261057.0$, $p=0.018$). For positive life events, dependent events (median=9) were significantly greater than independent events (median=3, ($U=325920.5$, $p=0.000$) while for negative life events, independent events (median=2) were greater than dependent events (median=6, $U=192696.0$, $p=0.000$).

13.6% of the adolescents were depressed (KADS-6 cut-off score of 9) in our sample. The mean KADS-11 score was 9.27 (SD 5.18). 52% of the sample screened positive for adolescent anxiety

(SCARED cut-off score of 30), with a mean score of 30.02 (SD 11.65). The mean KIDSCREEN-10 score (HRQoL) was 34.56 (SD 5.72). The mean Rosenberg Self Esteem scale score was 27.67 (SD 3.78).

There were no significant differences in gender, age of students, and the presence of siblings among life event categories viz., total positive/negative, dependent positive/negative, and independent positive/negative (all p values > 0.05).

Adolescent students with depression experienced significantly more total negative events (Mann-Whitney U=105308.0, p=0.009), including both dependent (U=105050.0, p=0.004) and independent negative events (U=105935.0, p=0.039) compared to students without depression (Table 1).

Table-1: Comparison of stressful life events among adolescents with and without depression using the Mann-Whitney U test

CASE life event categories	Median CASE scores		95% CI	Mann Whitney U	p value
	Without depression	With depression			
Total Positive	13	13	-1.001, 2.000	108922.5	0.524
Total Negative	12	15	-6.001, -0.999	105308.0	0.009
Dependent Positive	9	8	-0.999, 2.000	109331.0	0.314
Dependent Negative	3	4	-2.000, -0.000	105050.0	0.004
Independent Positive	2	3	-1.000, -0.000	107098.5	0.301
Independent Negative	6	7.5	-3.000, 0.000	105935.0	0.039

*KADS-6 cut off score of 9 was used detect adolescent depression. p values < 0.05 are significant.

Adolescents with anxiety experienced significantly more total negative life events (U=50864.0, p=0.000), including both dependent (U=54610.0, p=0.001) and independent negative life events (U= 51859.5, p=0.001) compared to those without anxiety (Table 2).

Table-2: Comparison of stressful life events between adolescents with and without anxiety using Mann-Whitney U test

CASE life event categories	Median CASE scores		95% CI	Mann Whitney U	p value
	Without anxiety	With anxiety			
Total Positive	14	13	-1.001, 2.000	60866.5	0.644
Total Negative	9	15	-6.000, -3.001	50864.0	0.000
Dependent Positive	9	9	-1.000, 1.000	59000.0	0.488
Dependent Negative	3	4	-2.000, 0.000	54610.0	0.001
Independent Positive	2	2	0.000, -0.000	60746.0	0.690
Independent Negative	5	7	-3.000, -1.000	51859.5	0.001

* SCARED cut off score of 30 was used to screen for the presence of anxiety. p values < 0.05 are significant.

There was a significant *positive* correlation between adolescent HRQoL and total positive (Spearman's rho=0.146, p=0.001) and dependent positive (rho=0.161, p=0.001) life events.

There was a significant *negative* correlation between HRQoL and total negative (rho=-0.093, p=0.038) and dependent negative (rho=-0.122, p=0.006) life events among the students (Table 3).

Table-3: Correlation between stressful life events & health related QoL (KIDSCREEN-10) of adolescent students using Spearman's rank correlation

CASE life event categories	Spearman's rho	p value
Total Positive	0.146	0.001
Total Negative	-0.093	0.038
Dependent Positive	0.161	0.001
Dependent Negative	-0.122	0.006
Independent Positive	0.043	0.335
Independent Negative	-0.065	0.146

p values < 0.05 are significant.

Multiple linear regression analysis using the fit regression model was performed to quantify the simultaneous impact and influence of life event categories and self-esteem (predictor variables) on response variables (a) depression, (b) anxiety, and (c) HRQoL.

(a) Results indicated that life events and self-esteem explained 19.23% variance (R-sq (adj) 18.41%, $F=23.52$, $p=0.000$) in adolescent depression. Among the predictor variables, only dependent negative life events ($T=2.66$, $p=0.008$), independent negative live events ($T=2.46$, $p=0.014$) and low self-esteem ($T=-9.50$, $p=.000$) significantly predicted adolescent depression, with low self-esteem having the highest impact on adolescent depression (Table 4).

Table-4: Multiple regression analysis of adolescent depression (KADS-11) versus life events (CASE) and self-esteem

Term	B	Std. Error	T	P
Constant	22.19	1.60	13.86	0.000
Dependent Positive	0.02	0.05	0.44	0.661
Dependent Negative	0.16	0.06	2.66	0.008
Independent Positive	0.09	0.06	1.43	0.153
Independent Negative	0.10	0.04	2.46	0.014
Rosenberg self-esteem scale	-0.53	0.06	-9.50	0.000

p values < 0.05 are significant.

(b) Results indicated that life events and self-esteem explained 16.97% variance (R-sq (adj) 16.13%, $F=20.19$, $p=0.000$) of adolescent anxiety. Among the predictor variables, only dependent negative life events ($T=2.04$, $p=0.042$), independent negative life events ($T=5.49$, $p=0.000$) and low self-esteem ($T=-6.86$, $p=0.000$) significantly predicted adolescent anxiety, with low self-esteem having the highest impact on adolescent anxiety (Table 5).

Table-5: Multiple regression analysis of adolescent anxiety (SCARED) versus life events (CASE) and self-esteem

Term	B	Std. Error	T	P
Constant	48.68	3.65	13.35	0.000
Dependent Positive	0.05	0.11	0.46	0.642
Dependent Negative	0.28	0.14	2.04	0.042
Independent Positive	0.14	0.14	0.98	0.326
Independent Negative	0.50	0.09	5.49	0.000
Rosenberg self-esteem scale	-0.88	0.13	-6.86	0.000

(c) Results indicated that life events and self-esteem explained 19.03% variance (R-sq (adj) 18.21%, $F=23.22$, $p=0.000$) in adolescent HRQoL. Among the predictor variables, only dependent positive life events ($T=2.47$, $p=0.014$) and self-esteem $T=9.67$, $p=0.000$) significantly predicted adolescent HRQoL, with high self-esteem having the greatest impact on adolescent HRQoL (Table 6).

Table 6: Multiple regression analysis of adolescent HRQoL (KIDSCREEN-10) versus life events (CASE) and self-esteem

Term	B	Std. Error	T	P
Constant	20.40	3.09	6.60	0.000
Dependent Positive	0.24	0.10	2.47	0.014
Dependent Negative	-0.15	0.12	-1.33	0.185
Independent Positive	0.02	0.12	0.18	0.854
Independent Negative	-0.14	0.08	-1.84	0.066
Rosenberg self-esteem scale	1.05	0.11	9.67	0.000

p values < 0.05 are significant.

Discussion

The results of the study show that adolescents ($n=500$) experienced significantly more positive than negative life events across all categories of CASE. Moreover, among positive events, adolescents experienced significantly more dependent events than independent life events. However, for negative life events, independent events were significantly more common than positive events. In other words, adolescent positive life events were more dependent on their

behavior, while negative life events more out of their control or independent of their behavior. This information paints a clearer picture of the adolescent life events. This was possible by using a questionnaire like the CASE which classifies life events as positive or negative based on the subjective impact it has on the person experiencing it and also into dependent and independent, based on the level of control the subject has over the experience. This is in contrast with scales that measure a unidimensional concept of life events as stressful (stressful life events) and thus explicitly negative. Research focused solely on documenting the negative aspects of life events (stressful life events), may paint an incomplete and potentially misleading picture of their impact and adjustment following life events [22]. However, most studies on adolescent stressors have failed to look past this conceptual barrier and thus have viewed and classified life events as stressful in a negative way. This perspective of life events has permeated this area of research inquiry so much so that questionnaires that document life events assume that these events are inherently stressful ignoring the self-perception of the experiencer. Research with adults has demonstrated the influence of life events on positive subjective well-being, and it should be no different for adolescents [23].

There was no significant gender difference in the experience of life events among the adolescent student sample across all life event categories (positive versus negative, dependent versus independent, all p values > 0.05). It is a commonly held belief that adolescent girls experience much more negative life events than boys, given that gender differences in depression also emerges during this period [24]. However, a meta-analysis concluded that females report only marginally higher levels of stressful life events than males [25]. To explain the gender difference in psychopathology without any such significant differences in life events, some researchers have postulated that adolescent girls experience different stressful life events compared to boys

[26]. However, an Indian study on adolescent students (n=964, boys=509, girls=455) from 21 schools did not report gender differences in stressful life events in areas of peer relationships, family environment or daily hassles [27]. The study, however, did not classify stressors (independent and dependent), did not measure positive life events, and used an indigenous life events scale specifically designed for the study. We propose that our findings are more in line with the 'moderational stress reactivity model' which posits that adolescent females react differently than boys when they experience similar stressors [28].

Our study found that adolescents with depression experienced significantly more total negative (W=105308.0, p=0.009), dependent negative (W=105050.0, p=0.004) and independent negative life events (W=105935.0, p=0.039) compared to those without depression. In a meta-analysis of 71 studies (aggregated sample size 37,173), Yue Li et al., reported a significant positive correlation between stressful life events and depression in adolescents with an effect size of 0.319 (p< 0.001) [29]. A community based, prospective epidemiological study showed that the total number of stressful life events during adolescence predicts future episodes of depression and anxiety in young adulthood independent of initial anxiety and depressive symptoms [30]. Thus, previous research studies lend support to our findings of a significant preponderance of negative life events in adolescents with depression.

Adolescents with anxiety experienced significantly more total negative life events (p=0.000), including both dependent (p=0.001) and independent life events (p=0.001) compared to those without anxiety in our sample. Also, the severity of adolescent anxiety symptoms in our sample correlated significantly with total negative, dependent negative, and independent negative life events. Negative life events (total, dependent, and independent) have been reported to precede anxiety symptoms and disorders in children and adolescents [31-33]. Independent negative

events that are perceived as uncontrollable can be understood to predispose to anxiety. The role of dependent negative events, however, needs to be explained. Life events that are perceived to be directly due to one's behavior (dependent) are frequently associated with behavioral traits of avoidance and rumination which prime these students to experience these events more often in their lives [34]. The present study, being cross-sectional in nature, was not designed to study this causal relationship.

There was a significant positive correlation between adolescent HRQoL, total positive, and dependent positive life events in our sample. We also found a significant negative correlation between adolescent HRQoL, total negative, and dependent negative life events. As this is the only Indian study to have assessed the relationship between QoL and life events in adolescents, the discussion will be limited to research from other parts of the world. QoL, life satisfaction and well-being have all shown to be significantly associated with life events among adolescents [35,36]. Our findings, that dependent rather than independent life events (both positive and negative) influenced QoL in adolescents need further discussion. Stressful life events, either independent of, or dependent on, the individual's behavior, trigger psychopathological symptoms in people with low self-esteem. These then makes the individual vulnerable to experiencing subsequent dependent stressful life events, which serves to undermine their self-esteem further. This, in turn, makes them vulnerable to subsequent depression or anxiety, which predisposes them to additional dependent stressful life events, which continue to undermine their QoL [37].

The regression model predicted that self-esteem had the highest negative impact on adolescent depression in comparison to all life event categories. In other words, low self-esteem was found to be the greatest predictor of adolescent depression, an effect that was more than negative life events. This concurs with previous findings that self-esteem is the most important factor for

retaining psychological and social functioning during adolescence [38]. Also, low self-esteem has been shown to be strongly associated with depression while high self-esteem, a strong protective factor against depression [39].

In adolescent anxiety, the regression model predicted that self-esteem had the highest negative impact on adolescent anxiety in comparison to all life event categories. Our findings agree with the meta-analysis of 18 longitudinal studies on the impact of self-esteem on adolescent anxiety [40]. Specifically, the results replicate the findings by Moksnes et al., who reported that self-esteem moderated the association between dependent negative events (peer pressure, poor school performance, and problems in romantic relationships) and anxiety [41].

As for the protective role of self-esteem on adolescent HRQoL, our results indicate that self-esteem had the highest positive impact on adolescent HRQoL in comparison to even positive life events. Self-esteem plays an important role in an adolescent's self-concept and is likely to be a fluctuating and dynamic construct, susceptible to internal and external influences. There have been no previous studies that have looked into the moderating effect of self-esteem on the HRQoL of adolescents. This lacuna is indeed surprising as the concept of QoL goes beyond psychopathology towards holistic wellness in the broadest sense. This study, by finding that self-esteem played the most important role in determining HRQoL in adolescents, needs to be validated by future research.

To the best of our knowledge, this is the first Indian study to explore the impact of life events on adolescent psychopathology and HRQoL. It is also the first of its kind to study the effect of self-esteem as a moderating factor on the HRQoL of adolescent students of India. Life events were assessed comprehensively, across the spectrum, including positive events. By analyzing life events as dependent and independent, we were able to get a better conceptual understanding of

the interplay of such events on adolescent mental health. Many studies on stressful life events have used life change units to assess the impact of life events. Though this approach has wide support in literature, we believe that the adolescent who experiences these events is best positioned to judge their impact on his/her life. The CASE rating scale used in our study does not make apriori assumptions as to the impact of these life events by assigning a score without the subjective response from the adolescent.

Depression and anxiety were assessed using validated and reliable rating scales like the KADS and SCARED respectively in the adolescent population. Instead of using the WHOQoL questionnaire to measure quality of life, we have used the KIDSCREEN-10 instrument that has been specifically designed for use in children and adolescents. Though this can potentially limit the generalizability of the findings, we believe that this scale better captures the essence of an adolescent view about his life satisfaction, mental and physical health.

This study is not without its limitations. Since we employed a cross-sectional design, it was not possible to determine causal direction among the variables, as correlation does not necessarily imply causation. All findings are based on self-report data from questionnaires. The major criticism of self-report data is that of subjectivity. However, with a focus on subjective phenomena, subjectivity is also the strength of such data, since they reflect personal evaluations of health and health correlates. Further, the sample size of the present study can protect against the influences of potential random error related to self-report [42]. The study did not record potential confounders like parental income, family history of psychiatric illness, and parental occupation. This is because a pilot study done by the researcher found that students could not accurately report the above. The effect of public versus private schooling was not performed. The sample of the study was drawn from a population of urban adolescent students, and hence

the results would have to be extrapolated with caution if generalizations have to be made. However, most Indian studies in the area of adolescent mental health have this lacuna.

To conclude, identifying the link between life events in adolescents and health outcomes represents an important step toward developing preventive interventions. One target could certainly be to reduce exposure of adolescents to negative life events. Such interventions might include efforts to reduce stress in the family as well as in the school environment. However, given the limited control over life's uncertainties, it seems more prudent to make them more resilient to stressful life events.

The role of self-esteem as a buffering factor could be an important target for prevention of negative health consequences and positive adolescent development. Developing a congruent and optimal self-esteem should prepare adolescents to handle life's turbulent challenges by equipping them with the tools to make their journey through this phase of development a positive growth-oriented experience.

Conflict of interest: None declared.

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