Psycho-social wellbeing among in-school adolescents of Sri Lanka; prevalence of selected attributes and associated factors

Nalinda Wellappuli (nalinda.wellappuli@gmail.com)
Ministry of Health- Sri Lanka https://orcid.org/0000-0001-6934-2226
Nalika Sepali Gunawardena
World Health Organization
PK Buddhika Mahesh
University of Melbourne
Shanthi Gunawardena
Ministry of Health
Champika Wickramasinghe
Ministry of Health
Ayesha Lokubalasooriya
Ministry of Health
Renuka Peiris
Ministry of Edcuation
Chinthika Liyanage
Ministry of Health
Lalindi Hathurusinghe
Ministry of Health
Kanchana Mahagamage
Ministry of Health
Sameera Senanayake
Queensland University of Technology

Research article

Keywords: Sri Lanka, School Health, Psycho-social well-being, Suicide, Adolescents, Mental Health, Bullying, Loneliness

Posted Date: June 16th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-33489/v1

Abstract

Background

Adolescence period is associated with psycho-social issues which affect their day to day activities and go beyond their adolescent age group. It has been recorded that prevalence of psycho-social issues are rising globally. The aim of this study was to estimate the prevalence and factors associated with the selected attributes of psycho-social well-being among 13 to 17-year in-school adolescents of Sri Lanka using the Global School Health Survey (GSHS), conducted in Sri Lanka.

Methods

GSHS, was a cross-sectional study conducted among 3,650 adolescents of aged 13–17, attending government schools. Data was collected using a self-administered questionnaire. Psychosocial well-being included questions of four selected outcomes (i.e. bullying, felling alone, sleep disturbances due to a worry, suicidal ideation and practices) and 10 potential associated factors of these. The sample was selected through a two-staged cluster sampling technique. In determining the independent associated factors, multivariable analysis was done with multiple logistic regression.

Results

Most of the students who responded belonged to the 13–15 age group (66.5%) and with 51.1% were females. More than one third of the participants (37.7%, 95%CI 36.1–39.5) had experienced bullying 30 days prior to the study. ‘Feeling loneliness’ and ‘experiencing anxiety’ had been experienced by 9.0% (95%CI 8.0–10.0) and 4.7% (95%CI 3.9–5.4), respectively. The prevalence of planning an attempt of suicide was 6.3%, while 6.6% had at least once attempted suicide. Multivariable analysis revealed that lacked parental support and being engaged in a fight were independently associated with being bullied, feeling lonely and considering attempting suicide. Mutual association of the four outcomes with each other indicate that being bullied was significantly associated with experiencing loneliness and feeling anxiety. In addition, experiencing loneliness was independently associated “considering an attempt of suicide” (OR = 2.9, 95%CI = 2.0 to 4.3). Feeling anxiety was also associated with considering attempting suicide (OR = 3.4, 95%CI = 2.1 to 5.4).

Conclusion

This study demonstrated that the prevalence of psycho-social wellbeing is among school going adolescents is a major public health problem in Sri Lanka. School-based interventions to address these issues should be designed with the goal of increasing adolescents’ awareness of possible preventive measures of unintentional injuries.

Background

Adolescence includes the transitional period from childhood to the adulthood and often defined as from 10 to 19 years (1, 2). Prevalence of adverse psycho-social health issues is rising among these young people globally (3–5). One tenth of children and youth have some mental health problem that not only significantly interfere with their day today life but also go beyond the adolescence(3). Similarly, attributes of social disintegration, such as isolation and loneliness have been associated with a higher mortality (5, 6). Furthermore, many of the psychological problems reported in the adulthood are often found to have been originated in the adolescence(4, 7).

Presence of depressive symptoms, suicidal behaviours, loneliness, isolation are some manifestations of low psycho-social wellbeing among adolescents. It had been documented even before the 21st century that about 15% of adolescents experience depression to a moderate to severe degree (8). Depression and suicidal behaviours are inter-related. Suicidal ideations are strongly associated with suicidal attempts (8). In an Estonian study with 13–15 year school children, self-assessed depressive feelings and suicidality were found to be 26.1% and 12.8% respectively (8). Prevalence of negative social attributes extend across a vast range exceeding 30% of the adolescents in some settings(1, 9).

There are several associated factors negatively influencing the above manifestations, including bullying, substance abuse, smoking and peer-violence. These factors are associated with many mental health problems like anxiety, depression and suicidal ideation (10, 11). Additionally these factors are likely to be persistent or repeatedly occur, thus augmenting their negative effect over time (12). The prevalence of these factors varies from school grade to school grade. In some circumstances, even teachers are unaware of these factors. As an example, in a study done in Pakistan, more than half of the teachers did not have adequate knowledge on bullying(13). To the contrary favourably associated factors that reduce the risk of the above manifestations include family bond and the practice of life skills (14, 15).

Sri Lanka, an island in the Indian Ocean with a population of 21.7 million, has been recently graduated to an upper-middle income level(16). Out of the total population, around 16.2% are between 10–19 years(17). Documented literature on adolescent psycho-social wellbeing is not commonly found in Sri Lanka. However, the limited available findings imply that psycho-social problems among adolescents are far from being rare (18, 19). Among the adolescents in Sri Lanka about 70% are schooling(20). Hence schools have become ideal settings for the exploration of adolescent issues.

Global School-Based Student Health Survey (GSHS) has been developed by the World Health Organization with other collaborators with aims that include helping countries in identifying priorities and trends(21, 22). Accordingly, GSHSs have been conducted globally by Ministries of Health and Education from 2003(20). The last GSHS has been completed in Sri Lanka in 2016 and the previous in 2008 with the objective of assessing the prevalence of health behaviours and the protective factors(11, 23). In the GSHS-2008, there were some eye-opening findings. As examples nearly 10% of students between 13–15 years had stated that they had seriously considered attempting suicide during previous 12 months. Similarly, 7.6% had felt alone always or most of the time(23). In the GSHS-2016, participants of 16 and

17 years were additionally included in the study population. Therefore, findings of GSHS-2016 would spread across a full range of 13 to 17 year period of the adolescence and would enable detecting trends when compared with the findings of 2008.

In this background, this paper describes the findings of a secondary analysis of the GSHS-2016 data in relation to factors associated with the selected attributes of psycho-social well-being among 13 to 17-year in-school adolescents of Sri Lanka.

Methods

GSHS-2016 was completed as a descriptive cross-sectional study among a representative sample of in-school adolescents aged 13–17 years who were in grades 8 to12, in 25 districts of Sri Lanka. Being enrolled in a government-school was an eligibility-criteria. Data collection was done between 1st October 2016 to 30th November 2016. The survey included a two-stage cluster sampling method in a sampling frame of 40 schools including 3650 students. In stage I, 40 schools were selected and stage II, systematic sampling was used to select classes of those schools. Minimum sample size needed at the data collection stage was estimated to be 3125 with a 5% margin of error and an assumed response rate of 80%. At the end of the two rounds, the selected classes included 3650 potential participants.

The data collection was done using a standard self-administered questionnaire developed by WHO. The questionnaire was culturally adopted to the Sri Lankan context and translated to the two mainly practiced languages (i.e. Sinhalese and Tamil) in Sri Lanka. The participants had the option of selecting their choice of the language of the questionnaire. In addition to the demographic details of the generic questionnaire, the section on psychosocial well-being included questions of four selected domains (i.e. bullying, felling alone, sleep disturbances due to a worry, suicidal ideation and practices) and 10 potential associated factors of these. Data collection was facilitated and supervised by the principal investigator and was done by trained data collectors.

The data set was cleaned and edited for inconsistencies. Missing data were not statistically imputed. Analysis was done with Statistical Package of Social Sciences version 21. The prevalence of the outcome-domains and associated factors were described with the point estimates as well as confidence intervals. Bi-variable analysis was done using the uni-variable logistic regression. The effect measures of these associations were presented with their interval estimates. In determining the independent associated factors, multivariable analysis was done with multiple logistic regression. Beta coefficients and their confidence intervals were described for the associated factors.

Informed written consent was obtained from the from the parents/ guardians. Data collection was done on pre-planned days without interfering with the routine activities of the schools. Ethics approval was obtained from the Ethics Review Committee of Faculty of Medicine, Colombo (Approval number-EC-16-184).

Results

The overall response rate of the selected participants was 89% with 3262 usable data records. One hundred and sixteen (n=388) either did not give consent to be included in the study or was absent from school on the day of the data collection.

Characteristics of participants

Most of the students who responded belonged to the 13-15 age group (66.5%). The study group consisted of an equal proportion of males (48.9%) and females (51.1%) (table 1). Further analyses were performed on the 3173 participants who were within the 13 to 17 years (i.e. excluding the 88 participants who were studying between grades 8-12 but being outside these age limits).

Selected outcomes related to psycho-social well-being psycho-social well-being

The table 2 shows the percentage of participants who experienced three selected outcomes in relation to psycho-social well-being, namely being subjected to bullying, feeling loneliness and experiencing anxiety.

More than one third of the participants (37.7%) had experienced bullying 30 days prior to the study, with a significantly higher male (48.6%, 95% CI 45.8- 51.2) preponderance compared to females (28.9%, 95% CI 26.7-30.9). 'Feeling loneliness' and 'experiencing anxiety' had been experienced equally by both sexes. The prevalence of experiences in bullying was similar between the two age categories (age 13-15 years and 16-17 years). In contrast, "feeling loneliness" was significantly higher in the older age group (12.0%, 95% CI 9.9-14.0) compared to the 13-15 category (7.6%, 95% CI 6.5-8.7). Significantly more students in the elderly group (i.e. age group 16-17 years) (6.3%, 95% CI 4.8-7.9) had experienced anxiety compared to their younger counterparts (3.7%, 95% CI 2.9-4.5).

Table 3 depicts three outcomes in relation to psycho-social well-being, related to suicides: ideation, planning and attempting. Nearly one tenth of the participants have seriously considered attempting suicide. The prevalence of planning an attempt of suicide was 6.3%, while 6.6% had at least once attempted suicide. None of these outcomes showed significant difference between different sex and age groups.

Associations of psycho-social wellbeing

Table 4 shows unadjusted associations of eleven selected characteristics in relation to four selected outcomes of the psycho-social wellbeing: being bullied, feeling loneliness, experiencing anxiety and considering attempting suicide.

It is observed that except for the age, other characteristics are statistically significantly associated with being bullied at 5% significant level. The highest effect measure was observed for “being physically attacked”. A participant who has been physically attacked is 4.9 times likely to be subjected to bullying compared to one without. Except for the sex of the participant, other characteristics were significantly associated with experiencing loneliness. The highest effect measure was observed for “lacking parental support” (OR=2.5, 95% CI= 1.9- 3.2). Ten characteristics had been associated with considering attempting suicide, with age and sex being the only exceptions. “Lacked parental support” and “having ever smoked” were associated with 2.7 times likelihood of considering attempting suicide compared to absence of those factors.

Table 5 shows the adjusted effect measures of these associations. Adjustments have been done for the other 10 characteristics in this table as well as for the presence of these outcomes (as mentioned in table 6). Out of the characteristics mentioned in Table 5, five were independently associated with being bullied: male sex (OR=1.7, 95% CI=1.4 to 2.1), lacking parental support (OR=1.3, 95% CI=1.1 to 1.5), lacking parental supervision (OR=1.6, 95% CI=1.2 to 1.9), being physically attacked (OR=3.0, 95% CI=2.5 to 3.7) and being in a fight (OR=2.1, 95%CI=1.7 to 2.5). Older age (OR=1.7, 95% CI=1.2 to 2.3) and lack of parental support (OR=1.8, 95% CI=1.3 to 2.5) were independently associated with experiencing loneliness while male sex was observed to be a protective factor (OR=0.6, 95% CI=0.4 to 0.8). Five factors were associated significantly with considering attempting to suicide. Those were: not having close friends (OR=1.6, 95% CI=1.01 to 2.7), not engaging in sports (OR=1.5, 95% CI=1.1 to 2.1), lacking parental support (OR=1.7, 95% CI=1.2 to 2.3), lacking parental supervision (OR=1.5, 95% CI=1.1 to 2.1) and being in a fight (OR=1.5, 95% CI=1.1 to 2.1).

Mutual correlations of these four outcomes with each other are mentioned in table 6. Being bullied was significantly associated with experiencing loneliness (OR=2.4, 95% CI=1.8 to 3.3) and feeling anxiety (OR=2.8, 95% CI= 1.7 to 4.5). In addition, experiencing loneliness was independently associated “considering an attempt of suicide” (OR=2.9, 95% CI=2.0 to 4.3). Feeling anxiety was also associated with considering attempting suicide (OR=3.4, 95% CI= 2.1 to 5.4).

Discussion

This is the first documented journal article exploring the factors independently associated with four important attributes (i.e. being bullied, feeing lonely, experiencing anxiety and ideation of attempting suicide) among a national-wide sample of 13–17 year old school children. The prevalence of these attributes was notably high with nearly 38% being bullied, 9.3% considering attempting suicide, 9% feeling lonely and 5% experiencing anxiety. In general, there was a notable mutual co-existence of these attributes, highlighting their vicious impacts of the life of the school children. The present study revealed: Older age (for 2 attributes), male gender (for 2 attributes), lacking parental support (for 3 attributes), lacking parental supervision (for 2 attributes), being physically attacked (for 1 attribute) and engaging in a fight (for 4 attributes), not engaging in sports (for 1 attribute) and not having close friends (for 1 attribute) as independent risk factors.

The comparison of the prevalence of the attributes with the findings of the 2008 survey depicts notable observations. The percentage of children subjected to bullying has remained more or less the same (around 37% in overall) with a slight increase among boys(23). The proportion of children who felt lonely (most of the time or always) remained the same (i.e. 7.6%) despite having an extended sample with two additional older years(23). In fact, the prevalence was relatively higher (12% versus 7.6%) among the children between 16–17 years compared to those between 13–15 years. Even though a slight decrease was observed in the proportion of those seriously considering the suicide (9.9% versus 9.3%), the burden was relatively higher (0.5% in excess) among the children who were 16–17 years. These provides two important inferences. One is that the burden of thee psycho-social attributes have remained unchanged in between 2008 to 2016. Second is that these remain issues with similar or higher magnitude even among the sub-group of 16–17 years, which were not included in the 2008 survey. Both these phenomena reflect the necessity of novel interventions in addressing these immediately.

It is important to review similar regional GSHS findings with these Sri Lankan observations. As an example, the percentage of children 13–17 years who seriously considered suicide in past 12 months were: 4.9% in Bangladesh (2014), 5.4% in Indonesia (2015), 13.7% in Nepal (2015), 12.5% in Thailand (2015) and 15.2% in Maldives (2014)(24–28). As another example, the proportions who were bullied included: 24.6% in Bangladesh (2014), 20.6% in Indonesia (2015), 51% in Nepal (2015), 29.5% in Thailand (2015) and 22.2% in Maldives (2014)(24–28). There are global settings like Liberia(2017) where the proportions are further higher with children seriously considering suicide being reported as 21.0% and the bulled percentage as 49.2%(29). This reflects that these problems are not unique to Sri Lanka, but persist as regional and global burdens. However with the far improved health standards and achievements as well as with the well-established public health infrastructure, Sri Lanka is at a more favourable position in addressing these(30, 31).

The risk factors explored in the survey are known to be present with a notable magnitude in the study population. This is complemented by other published literature on the 2016 GSHS as well. As examples, the GSHS findings show that the prevalence of violence-related factors are far from rare with 44.2% being

in a fight and 35.1% being physically attacked(11). Additionally, the prevalence of alcohol, smoking, smokeless tobacco and substance abuse within the previous 30 days had been between 2–4%(32). The alcohol and tobacco related risk factors are in general reported at a lower level than compared to regional settings(25–28), whereas violence related items like being engaged in a fight are reported at the same or a higher magnitude(24–28). The findings of the present study reflect the co-existence of the psycho-social attributes. Each four attribute was significantly associated with at least two more attributes when adjusted for all the factors included in the study. This in in congruence with the global literature that these conditions have mutual associations(33–35). These imply the importance of screening and detection of school children of affected with these attributes and the value of early intervention as the presence of one attribute is independently associated with the occurrence of another.

Out of the 14 factors explored for each attribute (i.e. including their mutual associations), except for age and sex, all other nine were modifiable. Out of these, factors related to the domains of lack of parental involvement, presence of violence and not engaging in sports activities were detected as independently associated with the psycho-social attributes. Even if the substance-use did not yield direct significant associations with these four attributes, these are well known to be associated with factors that increase their likelihood with reference to observations of the same study population (11, 32). This highlights the need of a comprehensive package addressing the web of causation of these related outcomes. The initiatives like “promotion of life skills” and “health promoting school programme” have been implemented with added emphasis in recent years as collaborative efforts of Ministries of Health and Education, addressing these phenomena (36, 37). The impact of these would hopefully help in reducing these burdens, which could be evaluated in the next GSHS.

There were several limitations of the study. Firstly, the study participants include only those who have been enrolled in government schools having excluded the students of the private sector. This was emphasized in interpreting data. Secondly the responses were given as stated by the participants without verification of the responses. Due to the sensitiveness of the questions asked, utilization of the self-administered questionnaires was the best available option. However, before administration of the questionnaires, the importance of the provision of genuine responses were highlighted to the whole classroom. Thirdly the study did not capture non-school going adolescents of the selected age group. Therefore, generalizing the findings to the entire adolescent population in Sri Lanka is not possible, as their circumstances may differ significantly. This was clearly mentioned in the eligibility criteria and was concerned in the interpretation of findings.

Conclusions

The four psycho-social outcomes- being bullied, experiencing loneliness, feeling anxiety and considering attempting suicide are prevalent in notable proportions among the school children of 13-17 years of Sri Lanka as suggested by the findings of GBSHS-2016. Nine out of eleven factors explored in the present study are significantly associated with at least one of these attributes. The presence of one attribute is significantly associated with the presence of at least two other attributes. High prevalence of the potential

risk factors of these when combined with this co-existence of these attributes could potentially increase the burden and worsen the impact of these. Detecting and managing these attributes among school children and addressing the potential risk factors must be regarded as a local as well as a regional priority.

List Of Abbreviations

CI - Confidence interval

GSHS - Global School-based Student Health Survey

OR - Odds Ratio

WHO - World Health Organization

Declarations

Ethics approval and consent to participate

The study is in accordance with Helsinki Declaration. The ethical clearance to conduct the study was received from Faculty of Medicine, University of Colombo, Sri Lanka (EC-16-184). Written informed consent was obtained from all parents/guardians prior to participation in the study and filling out the questionnaires. The form of consent was approved by the ethics committee.

Consent for publication

Not applicable

Availability of data and materials

The dataset used during the current study is available from WHO's NCD Microdata Repository (https://extranet.who.int/ncdsmicrodata/index.php/catalog/648)

Competing interests

The authors declare that they have no competing interest.

Funding

This study was funded by the World Health Organization (WHO). The funder only provided financial assistance to conduct the study and had no role in the study design, data collection, data analysis, data interpretation, or writing the manuscript.

Authors' contributions

NW, SS, NSG, AL; Research idea, study design, analysis and interpretation. SS, CL, LH, KM; Study design and data collection. SS, NW, BM; Drafting of the manuscript. NW, SS, NSG, AL, SG, CW, RP, BM; Data analysis, interpretation, supervision and mentorship. All authors read and approved the manuscript.

Acknowledgements

Authors would like to acknowledge Dr Manju Rani (Regional Advisor - NCD and Tobacco Surveillance) and Mr Naveen Agarwal of WHO SEARO, Delhi for technical and logistical support. Ms. Leanne Riley (WHO – Geneva), Dr. Laura Kann (CDC - Atlanta, USA) and others at CDC for providing technical support. All the students who have participated in the survey with enthusiasm, honesty and willingness

References

1. Lyyra N, Valimaa R, Tynjala J. Loneliness and subjective health complaints among school-aged children. Scand J Public Health. 2018;46(20_suppl):87-93.
2. World Health Organization. Health for the world's adolescents. A second chance in the second decade. Geneva; Switzerland 2014.
3. Membride H. Mental health: early intervention and prevention in children and young people. Br J Nurs. 2016;25(10):552-4, 6-7.
4. World Health Organization. The world health report 2001. Mental health: New understandings, new hope. Geneva: World Health Organization; 2004.
5. Tanskanen J, Anttila T. A Prospective Study of Social Isolation, Loneliness, and Mortality in Finland. Am J Public Health. 2016;106(11):2042-8.
6. Liu JH, You QL, Wei MD, Wang Q, Luo ZY, Lin S, et al. Social Isolation During Adolescence Strengthens Retention of Fear Memories and Facilitates Induction of Late-Phase Long-Term Potentiation. Mol Neurobiol. 2015;52(3):1421-9.
7. Gunnell D, Kidger J, Elvidge H. Adolescent mental health in crisis. BMJ. 2018;361:k2608.
8. Heidmets L, Samm A, Sisask M, Kolves K, Aasvee K, Varnik A. Sexual behavior, depressive feelings, and suicidality among Estonian school children aged 13 to 15 years. Crisis. 2010;31(3):128-36.

9. Nino MD, Cai T, Ignatow G. Social isolation, drunkenness, and cigarette use among adolescents. Addict Behav. 2016;53:94-100.
10. Nickerson AB. Preventing and Intervening with Bullying in Schools: A Framework for Evidence-Based Practice. Sch Ment Health. 2019;11(1):15-28.
11. Senanayake SJ, Gunawardena S, Wickramasinghe S, Wickramasinghe C, Gunawardena NS, Lokubalasooriya A, et al. Prevalence and Correlates of Interpersonal Violence Among In-School Adolescents in Sri Lanka: Results From the 2016 Sri Lankan Global School-Based Health Survey. Asia Pac J Public Health. 2019;31(2):147-56.
12. Gladden RM, Vivolo-Kantor AM, Hamburger ME, Lumpkin CD. Bullying Surveillance Among Youths: Uniform Definitions for Public Health and Recommended Data Elements. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention and U.S. Department of Education; 2014.
13. Shamsi NI, Andrades M, Ashraf H. Bullying in school children: How much do teachers know? J Family Med Prim Care. 2019;8(7):2395-400.
14. Jegannathan B, Dahlblom K, Kullgren G. Outcome of a school-based intervention to promote life-skills among young people in Cambodia. Asian J Psychiatr. 2014;9:78-84.
15. Sheftall AH, Asti L, Horowitz LM, Felts A, Fontanella CA, Campo JV, et al. Suicide in Elementary School-Aged Children and Early Adolescents. Pediatrics. 2016;138(4).
16. The world Bank. Sri Lanka: The World Bank; 2020 [Available from: https://www.worldbank.org/en/country/srilanka/overview#4.
17. Department of Census and Statistics Government of Sri Lanka. Census of Population and Housing 2012. Colombo; 2012.
18. Epidemiology Unit. Mental Health Status of Adolescents in Sri Lanka: Evidence for Action- Part 1. Epidemiology Unit, Ministry of Health, Nutrition & Indigenous Medicine; 2017.
19. Lee H, Lee EY, Greene B, Shin YJ. Psychological Distress among Adolescents in Laos, Mongolia, Nepal, and Sri Lanka. Asian Nurs Res (Korean Soc Nurs Sci). 2019;13(2):147-53.
20. Ministry of Health Nutrition and Indigenous Medicine and Ministry of Education Government of Sri Lanka. Report of the 2016 Sri Lanka Global School-Based Student Health Survey. Colombo; 2017.
21. World Health Organization. Global school-based student health survey (GSHS) purpose and methodology: World Health Organization; 2019 [Available from: https://www.who.int/ncds/surveillance/gshs/en/.
22. Prevention CfDCa. Global School=based Student Health Survey (GSHS): U.S. Department of Health & Human Services; 2018 [Available from: https://www.cdc.gov/gshs/index.htm.
23. World Health Organization. Global school-based student health survey (GSHS)- Sri Lanka 2008-Fact sheet World Health Orgaization; 2020 [Available from: https://www.who.int/ncds/surveillance/gshs/Sri_Lanka_GSHS_FS_2008.pdf.

24. World Health Organization. Global School-based Student Health Survey- Male- 2014 Fact sheet 2020 [Available from: https://www.who.int/ncds/surveillance/gshs/2014-Maldives-GSHS-FS-Male.pdf.
25. World Health Organization. Global School-based Student Health Survey- Thailand-2015 Fact sheet 2020 [Available from: https://www.who.int/ncds/surveillance/gshs/2015-Thailand-GSHS-Fact-Sheet.pdf.
26. World Health Organization. Global School-based Student Health Survey- Nepal- 2015 Fact sheet 2020 [Available from: https://www.who.int/ncds/surveillance/gshs/gshs_fs_nepal_2015.pdf.
27. World Health Organization. Global School-based Student Health Survey- Bangladesh- 2014 Fact sheet 2020 [Available from: https://extranet.who.int/ncdsmicrodata/index.php/catalog/485.
28. World Health Organization. Global School-based Student Health Survey- Indonesia- 2015 Fact sheet 2020 [Available from: https://extranet.who.int/ncdsmicrodata/index.php/catalog/489.
29. World Health Organization. Global School-based Student Health Survey- Liberia-2017 Fact sheet 2020 [Available from: https://www.who.int/ncds/surveillance/gshs/Liberia_2017_GSHS_FS.pdf.
30. Jayatilleke AC, Yoshikawa K, Yasuoka J, Poudel KC, Fernando N, Jayatilleke AU, et al. Training Sri Lankan public health midwives on intimate partner violence: a pre- and post-intervention study. BMC Public Health. 2015;15:331.
31. Mahesh PKB, Gunathunga MW, Arnold SM, De Silva LSD, Wijeratne MP, Weragoda J. Will prevention be better than cure? The challenge of retaining health staff in the public health sector in Sri Lanka. Journal of the College of Community Physicians of Sri Lanka. 2018;24(1).
32. Senanayake S, Gunawardena S, Kumbukage M, Wickramasnghe C, Gunawardena N, Lokubalasooriya A, et al. Smoking, Alcohol Consumption, and Illegal Substance Abuse among Adolescents in Sri Lanka: Results from Sri Lankan Global School-Based Health Survey 2016. Advances in Public Health. 2018;2018.
33. Calati R, Ferrari C, Brittner M, Oasi O, Olie E, Carvalho AF, et al. Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. J Affect Disord. 2019;245:653-67.
34. Brunstein Klomek A, Marrocco F, Kleinman M, Schonfeld IS, Gould MS. Bullying, depression, and suicidality in adolescents. J Am Acad Child Adolesc Psychiatry. 2007;46(1):40-9.
35. Kaltiala-Heino R, Frojd S. Correlation between bullying and clinical depression in adolescent patients. Adolesc Health Med Ther. 2011;2:37-44.
36. School Health Unit. Functions of the Unit- Guidlines- Heath Promoting School Evaluation: Family Health Bureau- Sri Lanka; 2020 [Available from: http://www.fhb.health.gov.lk/index.php/si/technical-units/school-health-unit.
37. Guruge GGN, Perera KMN, Kandegedara KGPH. Assessment of the Existing School Health Promotion Program in a Selected Educational Zone, Sri Lanka - Cross - Sectional Study. International Journal for Research in Applied Sciences and Biotechnology. 2020;7(1).

Tables

Table 1: Description of study participants of the 2016 Sri Lankan Global School-Based Survey (N=3261)

Characteristic	Frequency	(%)
Age		
12 years or younger	66	(2.1)
13-15 years	2196	(66.5)
16-17 years	977	(30.7)
18 and older	22	(0.7)
Sex *(Missing – 19)*		
Male	1437	(48.9)
Female	1805	(51.1)

Table 2: Distribution of the study participants of age 13-17 by the frequency of been subjected to bullying during the last 30 days, felt loneliness during last 12 months and felt anxious during last 12 months by sex and age categories

	Subjected to bullying in last 30 days	Felt loneliness (most of the time or always) during past 12 months	Experienced anxiety (most of the time or always) in last 12 months
Variable	Percentage (95% CI)	Percentage (95% CI)	Percentage (95% CI)
Total	37.7 (36.1- 39.5)	9.0 (8.0- 10.0)	4.7 (3.9- 5.4)
Sex			
Males	48.6 (45.8- 51.2)	8.2 (6.8-9.7)	4.1 (3.2-5.2)
Females	28.9 (26.7-30.9)	9.5 (8.1-10.8)	4.8 (3.8-5.8)
Age			
13-15 years	37.7 (35.7-39.8)	7.6 (6.5-8.7)	3.7 (2.9-4.5)
16-17 years	36.8 (33.7-39.8)	12.0 (9.9-14.0)	6.3 (4.8-7.9)

Table 3: Distribution of the study participants of age 13-17 by the frequency of the consideration of attempting suicide, planned suicide, attempted suicide by sex and age categories

	Seriously considered attempting suicide	Planned attempting suicide	At least once attempted suicide
	Percentage (95% CI)	Percentage (95% CI)	Percentage (95% CI)
Total	9.3 (8.2-10.2)	6.3 (5.4-7.1)	6.6 (5.7-7.5)
Sex			
Males	9.6 (8.1-11.1)	6.1 (4.8-7.4)	6.6 (5.3-7.9)
Females	8.9 (7.6-10.2)	6.5 (5.3-7.6)	6.5 (5.3-7.7)
Age			
13-15 years	9.0 (7.8-10.2)	6.4 (5.3-7.4)	6.6 (5.7-7.7)
16-17 years	9.5 (7.7-11.3)	6.1 (4.5-7.5)	6.4 (4.8-7.9)

Table 4: Factors associated mental health illness (Unadjusted Odds Ratios with 95% CI) - from total study population

Characteristic		Total	Subjected to bullying 30 days	Loneliness- felt most of the time or always	Anxiety- last 12 months	Considered attempting suicide
Age	13-15	2196	1	1	1	1
	16-17	977	0.9 (0.8-1.1)	1.6 (1.2-2.1)*	1.8 (1.3-2.5)*	1.0 (0.8-1.4)
Sex	Male	1437	2.3 (2.0-2.7)*	0.9 (0.7-1.1)	0.8 (0.6-1.2)	1.1 (0.9-1.4)
	Female	1805	1	1		1
Ever smoking	Yes	189	3.4(2.5- 4.7)*	1.8 (1.2-2.8)*	3.1 (1.8-5.0)*	2.7 (1.8-4.1)*
	No	2906	1	1	1	1
Ever drinking alcohol	Yes	219	2.3(1.7-3.1)*	2.0 (1.4-3.0)*	2.5 (1.5-4.0)*	2.3 (1.5-3.3)*
	No	2929	1	1		1
Had close friends	No	180	1.4* (1.1-1.9)	2.3 (1.6-3.5)*	2.6 (1.5-4.2)*	2.5 (1.6-3.6)*
	Yes	3082	1	1		1
Students in their school were kind and helpful	No	1564	1.5* (1.3-1.8)	1.2 (0.9-1.6) *	1.7 (1.2-2.4)*	1.7 (1.3-2.2)*
	Yes	1666	1	1	1	1
Played one or more sports	No	532	0.7* (0.6-0.9)	1.6 (1.2-2.1)*	1.4 (0.9-2.0)	1.6 (1.2-2.1)*
	Yes	2730	1	1	1	1
Lacked parental support	Yes	1214	2.0* (1.7-2.8)	2.5 (1.9-3.2)*	2.6 (1.8-3.7)*	2.7 (2.1-3.5)*
	No	2013	1	1		1
Lacked parental supervision	Yes	987	2.5* (2.2-3.0)	2.1 (1.6-2.6)*	2.3 (1.7-3.2)*	2.6 (2.0-3.3)*
	No	2246	1	1		1
Was physically attacked	Yes	1119	4.9* (4.2-5.8)	2.0 (1.6-2.6)*	2.4 (1.7-3.3)*	2.0 (1.5-2.5)*
	No	2120	1	1		1
Was in a fight	Yes	1420	3.9* (3.3-4.5)	1.5 (1.2-1.9)*	2.4 (1.7-3.4)*	2.1 (1.7-2.7)*
	No	1838	1	1	1	1

**Significant at p=0.05 level*

Table 5: Factors associated with (Adjusted Odds Ratios with 95% CI)

Characteristic		Total	Subjected to bullying 30 days	Loneliness- felt most of the time or always	Anxiety- last 12 months	Considered attempting suicide
Age	13-15	2196	1	1	1	1
	16-17	977	1.0 (0.8-1.2)	1.7 (1.2-2.3)*	1.6 (1.1-2.5) *	0.8 (0.6-1.2)
Sex	Male	1437	1.7 (1.4-2.1)*	0.6 (0.4-0.8)*	0.6 (0.4-1.0)	0.9 (0.6-1.2)
	Female	1805	1	1	1	1
Ever smoking	Yes	189	1.3 (0.9-2.2)	1.1 (0.6-2.2)	1.5 (0.6-3.3)	1.1 (0.6-2.1)
	No	2906	1	1	1	1
Ever drinking alcohol	Yes	219	1.0 (0.7-1.6)	1.2 (0.7-2.1)	1.0 (0.5 – 2.2)	1.4 (0.8-2.4)
	No	2929	1	1	1	1
Had close friends	No	180	1.3 (0.9-2.0)	1.5 (0.9-2.6)	1.4 (0.7-2.8)	1.6 (1.01-2.7)*
	Yes	3082	1	1	1	1
Students in their school were kind and helpful	No	1564	1.1 (0.9-1.4)	0.9 (0.7-1.2)	1.4 (0.9-2.2)	1.2 (0.9-1.6)
	Yes	1666	1	1	1	1
Played one or more sports	No	532	0.9 (0.7-1.2)	1.3 (0.9-1.8)	1.1 (0.7-1.9)	1.5 (1.1-2.1)*
	Yes	2730	1	1	1	1
Lacked parental support	Yes	1214	1.3(1.1-1.5)*	1.8 (1.3-2.5)*	1.4 (0.9-2.1)	1.7 (1.2-2.3)*
	No	2013	1	1	1	1
Lacked parental supervision	Yes	987	1.6 (1.2-1.9)*	1.3 (0.9-1.7)	1.1 (0.7-1.8)	1.5 (1.1-2.1)*
	No	2246	1	1	1	1
Was physically attacked	Yes	1119	3.0 (2.5-3.7)*	1.3 (0.9-1.8)	1.1 (0.7-1.8)	1.1 (0.8-1.5)
	No	2120	1	1	1	1
Was in a fight	Yes	1420	2.1 (1.7-2.5)*	0.7 (0.5-1.01)*	1.7 (1.1-2.6)*	1.5 (1.1-2.1)*
	No	1838	1	1	1	1

*significant at p=0.05 level

Table 6: Mutual associations between the outcome variable

	Being bullied OR (95% CI)	Experiencing loneliness OR (95% CI)	Feeling anxiety OR (95% CI)	Considering attempting suicide OR (CI)
Being bullied				
Unadjusted	**NR**	3.2 (2.5-4.2)*	4.5 (3.1-6.5)*	2.6* (2.0-3.3)
Adjusted	**NR**	2.5 (1.8-3.5)*	2.8 (1.7-4.5)*	1.3 (0.9-1.7)
Experiencing loneliness				
Unadjusted	3.2 (2.5-4.2)*	**NR**	8.1 (5.7-11.5)*	5.2 (3.8-6.9)*
Adjusted	2.4 (1.8-3.3)*	**NR**	4.7 (3.0-7.4)*	3.0 (2.1-4.3)*
Feeling anxiety				
Unadjusted	4.5 (3.1-6.5)*	8.1 (5.7-11.4)*	**NR**	0.14* (0.1-0.2)
Adjusted	2.7 (1.7-4.3)*	4.5 (2.9-7.2)*	**NR**	3.4 (2.1-5.4)*
Considering attempting suicide				
Unadjusted	2.5 (2.0-3.3)*	5.1 (3.8-6.9)*	6.9 (4.8-9.9)*	**NR**
Adjusted	1.2 (0.9-1.7)	2.8 (2.0-4.1)*	3.4 (2.2-5.5)*	**NR**

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- supplement4.pdf