



Prevalence of Depression, Anxiety and Stress among High School Students in Singapore International School of Bangkok during the COVID-19: A cross sectional study

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Mental health in adolescents are particularly important and with the COVID-19 they are at higher risk of developing mental health problems

Purpose: The aims of this study were to assess depression, anxiety, and stress among high school students during the COVID-19 pandemic and to study the predictive factors for depression, anxiety, and stress.

Methods: Cross sectional online survey, 140 students from grades 10-12 in Singapore International School of Bangkok were invited to participate in completing the online questionnaire. A total of 90 students participated. Sociodemographic factors were analysed by descriptive statistics and the DASS-21 scale were used to assess the levels of Depression, Anxiety, and Stress.

Result: The majority of students displayed moderate levels of depression, anxiety, and stress at (n=75, 83.3%), (n=64, 71.11%) and (n=84, 93.33%) respectively. The predictive factors for depression were relationship with their families, and concurring mental health conditions, for anxiety they were relationships with family and friends, financial effects from the COVID-19, and concurring mental health conditions. Lastly for stress the predictive factors were relationship with friends, attitude towards online learning and mental health conditions.

Conclusion: The sudden outbreak of the COVID-19 affected the mental health of many high school students. The predictive factors for depression, anxiety, and stress were mostly about relationships and financial factors so providing support in these areas is very important therefore, online counselling services that are easily accessible to the students and their families should be implemented to monitor student's mental health, and they should also look into ways in which the students and their families can be supported financially.

Keywords: High school students, COVID-19, Depression, Anxiety, Stress, DASS-21

INTRODUCTION

Major depressive disorder, or what is commonly known as depression is a serious mental health condition that is becoming increasingly prevalent with each successive birth cohort [1]. This condition causes feelings of sadness and loss of interests in things a person once found enjoyable, the symptoms can range from just changes in appetite to even thoughts of suicide [2]. Another mental health disorder that is usually found alongside depression are anxiety disorders. There are many types of anxiety disorders but the most common is referred to

as the Generalised anxiety disorder (GAD). This is a condition that causes

feelings of anxiety constantly about a variety of issues, and usually lasts in the long term [3].

The Coronavirus Disease 2019 (COVID-19) which was first reported on 31st December 2019 [4] is currently the biggest health threat to all the global citizens, with over 226 million cases and nearly 5 million deaths worldwide [5]. This has forced most public operations in cities to close such as shopping malls, airports, and schools [6]. Not only is this currently affecting the global economy [7] but it is

greatly affecting high school students mentally as well. With the closure of schools, classes are now conducted online which may introduce more distractions from family members or from chores within the household [8]. This is a particularly big problem for high school students as they need to focus on their academics and prepare for university applications. Furthermore, adolescents tend to have more mental disorders such as mood swings or stress due to brain vulnerability [9] in this age so put together with the stress from university applications, an increased amount of stress may be expected which may result in a likelihood that they may be developing mental health issues.

This research aims to study the predictive factors associated with depression, anxiety, and stress (DAS) in high school students in SISB in hopes of helping to prevent or reduce the

prevalence of DAS during the lockdown periods. This may be done by raising awareness of the potential risks that may lead to the development of these mental health issues and also by finding alternatives to treatments that have been done physically in person as well.

Methods

Participants and procedure

This was a cross-sectional observational study. An online questionnaire was purposely developed and made available through Google From between 06-September-21 and 21-September-21. All students who were eligible were invited to participate in the study. The invitation was sent by the school's common social media platform. The students have access to the platform, so they all receive an invitation. In this invitation, information about the objectives of the study as well as the ethical guarantee of confidentiality and anonymity in the data collected as stated in the informed consent were explained. Participation was completely free and voluntary, and no personal data were collected from any participant. Of the 90 students, a total of 140 students participated in the study (response rate: 64.3%).

Instrument

The questionnaire was developed based on a literature review including (1) Mental health,

Depression, anxiety and stress, and the COVID-19 from NHS UK, Mayo Clinic, Johns Hopkins University. (2) related studies were used to assess each of the dimensions in this study (3) DASS21 questions were used to assess level of depression, anxiety and stress of the sample group.

A preliminary version of the instrument was reviewed by three experts to validate its content. A pre-test was then performed with a small sample of high school students to test for comprehension and difficulty. All the questions remained without modifications. The psychometric characteristics of the questionnaire were tested, as described in the statistical analysis subsection.

The final version of the questionnaire contained 34 questions; 13 about sociodemographic factors (gender, grade level, aimed faculty, physical health conditions, relationship with family, relationship with friends, financial effect from COVID-19, attitude towards online learning, mental health conditions, number of hours spent on social media, number of hours exercising per week, and risk perception of contracting COVID-19. and 21 items from the DASS-21.

The DASS-21 is a self-report questionnaire designed to assess the levels of depression, anxiety and stress.[10]. It consists of a total of 21 items with 7 items for each subscale [11].

It is a shortened version of the DASS which was originally developed by SH Lovibond, and PF Lovibond so the scores obtained from DASS-21 need to be multiplied by 2 to calculate the final score[12]. Studies on the validity show that the DASS-21's subscales can be used to measure depression, anxiety and stress validly and can also be studied further psychologically as well [11].

Statistical analysis

The analysis was performed using SPSS for windows, version 26. To analyses psychometric characteristics of the scales, an exploratory factor analysis, using principal component analysis with varimax rotation, was carried out. The descriptive analysis were presented in absolute (n) and relative (%) frequencies, mean (M) and standard deviations (SD). To assess the differences between the outcome variables (Levels of depression, anxiety, and stress) and the sociodemographic characteristics,

considering the sample size, independent t-test and the ANOVA were used as appropriate. A generalized linear model was calculated to determine the predictive variables of the preventive behaviors. Exp (β) and the respective 95% confidence intervals (95% IC) were presented. Statistical significance was defined as $p < 0.05$.

Ethical Approval.

Ethical approval was obtained from the study sites prior to data collection, and consent was assumed as completing the survey questions. Participants were informed that their participation was voluntary and that they could withdraw from the study at any point or choose not to answer any question. Participants' confidentiality was maintained as no identifying information was collected and findings will be disseminated only in aggregate.

This research uses an anonymous data collection method to collect data from grades 10-12 Students of Singapore International School of Bangkok (SISB), Bangkok, Thailand, using Google form. The invitation was sent by direct message to the students. In these invitations, information about the study's objectives and the ethical guarantee of confidentiality and anonymity in the data collected as stated in the informed consent was explained. Participation was

completely free and voluntary, and no personal data were collected from any participant.

Result

This study comprised a total of 90 participants. The sociodemographic characteristics of the sample are presented in Table 1. Most of the participants were female ($n=62$, 68.9%). The majority of the participants were in Grade 12 ($n=37$, 41.1%) followed by Grade 11 ($n=29$, 32.2%) and Grade 10 ($n=24$, 26.7%) respectively. 38 (42.2%) of the participants aim to study Medicine and Health followed by Business and Social Sciences ($n=30$, 33.3%) and Art & Design ($n=15$, 16.75). Most of the participants had no Physical health conditions ($n=78$, 86.7%) and had good relationships with their family ($n=75$, 83.3%) and friends ($n=79$, 87.8%). 34 (37.8%) were greatly affected financially by the COVID-19, and the rest were moderately or not affected at all. Most of the participants had a negative attitude towards online learning ($n=46$, 51.1%) and had no mental health conditions ($n=76$, 84.4%). The majority of the participants spent more than 6 hours on social media each day ($n=43$, 47.8%) and exercised for 1-3 hours per week ($n=44$, 48.9%). 55 (61.1%) perceived that their risk of contracting covid was low followed by 24 (26.7%) perceiving as moderately at risk and 11 (12.2%) at high risk. (Table 1)

Table 1.

Differences in outcomes according to the sociodemographic characteristics of participants (N = 90)

Sociodemographic characteristics	N (%)
Gender	
Male	22 (24.4)
Female	62 (68.9)
Prefer not to say	6 (6.7)
Grade Level	

Grade 10	24 (26.7)
Grade 11	29 (32.2)
Grade 12	37 (41.1)
Aimed Faculty	
Art & Design, Communication Art	15 (16.7)
Business, Social science, Language	30 (33.3)
Medicine and Health	38 (42.2)
Engineer, Technology	7 (7.8)
Physical health condition	
No	78 (86.7)
Yes	12 (13.3)
Relationship with your family	
Bad	3 (3.3)
Moderate	12 (13.3)
Good	75 (83.3)
Relationship with your friends	
Bad	2 (2.2)
Moderate	9 (10)
Good	79 (87.8)

Financially affected by COVID-19	
Not affected	27 (30)
Moderately affected	29 (32.2)
Greatly affected	34 (37.8)
Attitude towards online learning	
Bad	46 (51.1)
Moderate	30 (33.3)
Good	14 (15.6)
Mental health condition	
No	76 (84.4)
Yes	14 (15.6)
No.of hours spent on social media each day	
Less than 3 Hour	16 (17.8)
3-4 Hours	17 (18.9)
5-6 Hours	14 (15.6)
More than 6 Hours	43 (47.8)
No.of hours exercising per week	
Less than 1 Hour	33 (36.7)
1-3 Hours	44 (48.9)

More than 3 Hours	13 (14.4)
The risk of contracting COVID-19	
Low	55 (61.1)
Moderate	24 (26.7)
High	11 (12.2)
Total	90 (100)

83.3% (n=75) of the participants reported normal levels of depression followed by 14.44% (n=13) with moderate levels and 2.22% (n=2) with severe depression. Grade 12 showed the highest level of severe depression at 2.22% (n=2) followed by Grade 11 and 10 which both had 0%(n=0) of severe depression. (Table 2)

Table 2. Frequency and percentages of level of Depression in different grade levels.

Depression	Normal	Moderate	Severe	Total
Grade 10	20 (83.3)	4 (16.67)	0 (0)	24
Grade 11	22 (75.86)	7 (24.14)	0 (0)	29
Grade 12	33 (89.19)	2 (5.41)	2 (5.41)	37
Total	75 (83.3)	13 (14.44)	2 (2.22)	90

71.11% (n=64) of the participants reported normal levels of anxiety followed by 22.22% (n=20) with moderate levels of anxiety and 6.67% (n=6) with severe anxiety. Grade 11 showed the highest level of severe anxiety at 13.79% (n=4) followed by Grade 10 (n=1, 4.17%) and 12 (n=1, 2.70%)

(Table 3)

Table 3: Frequency and percentages of level of Anxiety in different grade levels

Anxiety	Normal	Moderate	Severe	Total
Grade 10	19 (79.17)	4 (16.67)	1 (4.17)	24
Grade 11	16 (55.17)	9 (31.03)	4 (13.79)	29
Grade 12	29 (78.38)	7 (18.92)	1 (2.70)	37
Total	64 (71.11)	20 (22.22)	6 (6.67)	90

93.33% (n=84) of the participants showed normal levels of stress followed by 6.67% (n=6) of moderate levels of stress and 0% (n=0) of severe stress. Grade 11 showed the highest level of moderate stress at 17.24% (n=5) followed by Grade 12 at 2.70% (n=1) and Grade 10 at 0% (n=0).

(Table 4)

Table 4. Frequency and percentages of level of Stress in different grade levels.

Stress	Normal	Moderate	Severe	Total
Grade 10	24 (100)	0 (0)	0 (0)	24
Grade 11	24 (82.76)	5 (17.24)	0 (0)	29
Grade 12	36 (97.30)	1 (2.70)	0 (0)	37
Total	84 (93.33)	6 (6.67)	0 (0)	90

Results from the generalized linear model indicated that the relationship with their family ($p < 0.05$), and mental health conditions ($p < 0.01$) had a statistically significant effect on depression. For anxiety they were the relationship with their family ($p < 0.05$), relationship with friends ($p < 0.05$), financial effect from the COVID-19 ($p < 0.05$) and mental conditions ($p < 0.01$) that had the most significance. For stress they were relationships with friends ($p < 0.05$), attitude towards online learning ($p < 0.05$) and mental health conditions ($p < 0.01$) that had the most significance. (Table 5)

Table 5. Generalized linear model predicting depression, anxiety, and stress.

	Depression P value (Sig)	Anxiety P value (Sig)	Stress P value (Sig)
Gender	.683	.453	.869
Grade Level	.403	.540	.636
Aimed Faculty	.127	.128	.759
Physical health condition	.556	.430	.968
Relationship with your family	.013	.040	.150
Relationship with your friends	.083	.016	.018
Financially affected by COVID-19	.424	.027	.068
Attitude towards online learning	.859	.116	.033
Mental health condition	.000	.001	.007
No.of hours spent on social media each day	.126	.103	.169
No.of hours exercising per week	.207	.079	.053
The risk of contracting COVID-19	.605	.563	.823

Discussion

The findings obtained from this study on the prevalence of depression, anxiety, and stress among highschool students in Singapore International School Of Bangkok during the Covid-19 showed that the majority of students had normal levels of depression, anxiety, and stress at (n=75, 83.3%), (n=64, 71.11%) and (n=84, 93.33%) respectively. During the COVID-19 lockdown when the closure of schools was implemented, quite an amount of academic stress was lifted from the students due to the teachers empathy for the abrupt transition to

online school, this may have been a factor that has helped the depression, anxiety, and stress levels stay within normal limits in the majority of students. Another explanation could be that at the time when this survey was distributed, it was the first week of school after a long term break so the students might have still been in holiday mood therefore no significant depression, anxiety, and stress levels were observed. This may also be due to the large percentage of students who have a good relationship with their family 75, 83.3% and friends 79,87.8%. Asian countries are said to have more close knit relationships between family members which may

possibly be a factor that helps to reduce stress that has built up during the COVID-19 lockdown[13]. Furthermore, adolescents in their highschool years tend to be receiving a lot of influence from their friends so having good relationships with their friends might have led them to having a better mental health status [14].

However, those who did suffer from more severe levels of depression and anxiety showed a link with mental conditions that were present and bad relationships with their family and friends. This correlates with a study by [15] which showed that people who experienced traumatic events or those with chemical imbalances in the brain are more prone to depression.

In other researches done on the psychological impacts of COVID-19 on students, there have been an array of results but most of them showed similar trends which is the increase in depression, anxiety, and stress due to the impacts of the COVID-19. Some reported that this was due to concerns on academic performance, with the transition to online school students have to adapt to sitting in front of their computers all day which not only negatively affects their health such as developing eye strains [16], back pains and more, but may also have increased distractions from studying in a new environment[17]. Other than academic performances it is also associated with increased use of social media which contributed to a decline in mental health during the pandemic as well[18].

Limitation

By distributing an online questionnaire, it was hard to make sure that every participant gave their honest and truthful answers as most of the participants were students and they may not have taken the survey seriously enough.

Conclusions

The total number of participants involved in this study were 90 people, most of them were females (n=62, 68.9%) followed by males (n=28, 31.1%). The results of the study showed that the majority of students had normal levels of depression, anxiety, and stress at (n=75, 83.3%), (n=64, 71.11%) and (n=84, 93.33%) respectively. The predictive factors obtained for depression were the relationship with their families, and concurring mental health

conditions, for anxiety they were relationships with family and friends, financial effects from the COVID-19, and concurring mental health conditions. Lastly for stress the predictive factors were relationship with friends, attitude towards online learning and mental health conditions.

From the results the policy maker should implement online counselling services that are easily accessible to the students and their families to be able to keep track of their student's mental health state, they should also look into ways in which the students and their families can be supported financially such as asking schools to consider adjusting school fees during the pandemic.

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