

Original Investigation

Health Impact due to Online Education in Mid-adolescent School Students at Kathmandu Valley during 2nd Wave of COVID-19 Pandemic

Dikshya Nepal^{1*} | Shailesh Pandit² | Mahendra Giri³

¹Research Officer, PT Birta City Hospital and Research Center Pvt. Ltd Birtamode, Jhapa, Nepal; ²Public Health Administrator, Chitwan; ³National Open College, Lalitpur-2, Bagmati, Nepal.

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*Correspondence:

Dikshya Nepal

Research Officer,
PT Birta City Hospital and
Research Center Pvt. Ltd
Birtamode, Jhapa, Nepal

E-mail:

dikshya037@gmail.com

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ABSTRACT

INTRODUCTION: There seems health impact both physical and mental health of mid – adolescent student due to online education due to untested way of implementation of remote mode of education .The aim of the study was to observe the health impact due to online education during covid-19 pandemic 2nd wave. **MATERIALS AND METHODS:** This cross sectional study was carried out among 338 mid-adolescent students of selected schools of Kathmandu valley through convenient sampling technique. Physical health was assessed through semi-structured questionnaire, anxiety was assessed by GAD-7 scale and perceived stress was assessed by PSS-10 scale with validated and pretested questionnaire. Data were entered in SPSS version 23 and Chi-square test was applied to identify the association of Health impacts with different independent variables. **RESULTS:** Mental problem like anxiety was found as mild anxiety in 26.3%, moderate anxiety in 21.9%, and severe anxiety in 8% of respondents. Regarding stress, low stress was found in 10.9%, moderate stress in 83.4%, and high stress in 5.6% of the respondents. The association was observed with perceived feelings of loneliness and isolation during online education with anxiety ($p<0.0001$) and stress($p<0.0001$); body ache ($p=0.032$) and headache ($p=0.047$) in-relation with type of gadget used, neck pain ($p=0.02$) and headache ($p=0.045$) in-relation with duration of online classes per day, backache ($p=0.037$) in-relation with physical activities, eye problem($p=0.016$) in-relation with sitting arrangement during online education. **CONCLUSIONS:** More than half of the student have seen either kind of physical health issues and among four in five respondents have seen moderate perceived stress. The association of health impact was seen with type of gadget used, duration of online class, physical activity and weight gain.

Keywords: Anxiety; Mental Health; Online Education; Physical Health; Stress



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INTRODUCTION

The school closures in 186 countries have affected more than 1.2 billion children worldwide [1,2]. Nepal, irrespective of other nations, is suffering from COVID-19 in which more than 1.3 million students [3] of different levels have lost their regular college activities, and universities are forced to withhold their examination and intake schedules. To overcome the educational challenges caused by COVID-19, like other countries, Nepal has been forced to migrate its teaching processes online for most schools. To minimize the impact on students, (2020) suggested that remote teaching can offer a significant role in filling educational gaps during the pandemic [4]. There is shift to virtual home education from the physical classroom education through different virtual apps like zoom, Google

meet and many more. This resulted in teaching and assessment through online with an untested and unprecedented scale which may have long term consequences [5]. Although, the online – virtual classrooms measures and efforts are highly commendable and necessary, there are reasons to be concerned because prolonged school closure and home confinement during a disease outbreak might have negative effects on children's physical and mental health. Evidence suggests that when children are out of school (eg, weekends and summer holidays), they are physically less active, have much longer screen time, irregular sleep patterns, and less favorable diets, resulting in weight gain and a loss of cardio respiratory fitness [6]. Corona pandemic showed

mental health, physical health or combination of both in student as well. There is seen obesity and increasing eye problem with frequent headaches may be of prolonged screen time. In addition, increasing stress, anxiety and depression due to home confinement along with sleep disorder [7]. In context of Nepal, lack of digitalization, internet-electricity-network-device problem has greater academic stress and burden to the students. The perception of academic stress is creating a very negative impact on their well-being, their decision to choose career options, sleeping difficulties, psychosomatic complaints, worrying about future, comorbid conditions like anxiety and depression, inability to manage course workload, etc [8]. Virtual learning fatigue is real, and it may lead to anxiety and stress for both students and professors. But since the COVID pandemic, there's a lack of interaction and students face social isolation. This greatly impacts the student's mental health. The lack of social interaction in online learning leads to feelings of loneliness, lack of motivation, and isolation. Staying focused on online classes is also a challenge like in terms of separating home life and class time, not following a routine schedule, the distractions at home, caused students not to be able to concentrate well with their classes. This causes pressure, stress, and anxiety to both students [9]. Therefore, to observe the physical and mental health status on student due to online education was felt necessary to carry out the research regarding online education and its impact on physical and mental health of student. The aim of the study was to observe the health impact due to online education during covid-19 pandemic 2nd wave.

MATERIALS AND METHODS

Study design and setting

The descriptive cross-sectional study design was adopted. The study was carried out among school children at Kathmandu Metropolitan City, Kathmandu, Nepal.

Participants, sample size and sampling technique

The mid-adolescent students aged between 14-17 yrs who were studying in school were included in this study. Schools were selected conveniently amongst school located inside the metropolitan city. The sample size was calculated using the formula for the descriptive cross-sectional study, and the calculated sample size was 338 with convenient selection of private schools

Data collection procedure and study variables

Semi structured questionnaire as well as Perceived Stress Scale (PSS 10) and Generalized Anxiety Disorder (GAD 7) questionnaire tools were used. Self-administration was carried out to collect information from mid-adolescent school children at Kathmandu Metropolitan City. To maintain the quality of control and assurance of this study pretest was done in a school which has similar characteristics of sampled school for content validity, and made some modification after the observation of pretest result. For stress, total possible score was ranged from 0 to 40. A total score of 0-13 were considered to be low stress, 14-26 indicate moderate stress and 27-40 indicate high stress in PSS score. For GAD, total score for seven items ranges from 0 to 21 that were categorized as: 0-4 minimal anxiety, 5-9 mild anxiety, 10-14 moderate anxiety, and 15-21 severe anxiety. For Anxiety, cut off value is 8 (GAD7) has a sensitivity of 92% and specificity of 76% for diagnosis generalized anxiety disorder and for stress cut off value was mean i.e. 18.

Statistical analysis and data management

Data was entered in IBM SPSS version 23 for its analysis which was transported to Microsoft Word for its interpretation. Univariate analysis was done and presented through frequency and percentage and for the bivariate analysis chi-square test was done to find out the association between study variables.

Ethical considerations

Ethical approval was taken to conduct this study from the Ethical Review Board, Department of Public Health, North South University, Dhaka, Bangladesh, and data collection permission was taken from Department of Education, Kathmandu Metropolitan City Office, Kathmandu and the respected schools. Informed written consent was taken during data collection and confidentiality was maintained of the respondents.

RESULTS

Table 1 shows sociodemographic data on 338 students, including their age, gender, religion, ethnicity, level of education attained by their parents, and the occupations of their parents and fathers. More than half (58.9%) of the students were male, and the majority of them were 14 or 15-year-olds (77.2%). The majority of the students were Brahmin/Chettri (58.6%) and follows Hinduism (86.7%). Most fathers (36.4%) and mothers (36.1%) had completed at least their secondary education. Majority of mothers were stay-at-home (46.4%), majority of fathers were employed in private industry (42.6%) or business (39.3%).

Table 1 Socio-demographic variable of students (n=338)		
Variable	Frequency	Percentage
Age		
14	142	42.0
15	119	35.2
16	58	17.2
17	19	5.6
Gender		
Male	199	58.9
Female	139	48.1
Religion		
Hindu	293	86.7
Buddhist	20	5.9
Christian	13	3.8
Muslims	12	3.6
Ethnicity		
Dalit	7	2.1
Janajati	101	29.9
Madhesi	11	3.3
Muslim	13	3.8
Brahmin/Chettri	198	58.6
Thakuri/Dashnami	8	2.4
Father's Education		
No Education	19	5.6
Primary	67	19.8
Secondary	123	36.4
Higher Secondary	129	38.2
Mother's Education		
No Education	57	16.9
Primary	62	18.3
Secondary	122	36.1
Higher Secondary	97	28.7
Father's Occupation		
Home Maker	10	3.0
Private Job	144	42.6
Agriculture	14	4.1
Government Job	26	7.7
Business	133	39.3
Others*	21	6.3
Mother's Occupation		
Home Maker	157	46.4
Private Job	61	18
Agriculture	6	1.8
Government Job	20	5.9
Business	94	27.8

*Contractor, driver, foreign employment, plumber

Table 2 includes additional socio-demographic information of students. The majority of students who took online courses gained weight (86.7%) and spent 2 to 6 hours online (71.9%). During online education, the majority (73.7%) of students talked about their feelings with a guardian. Most students used a mobile device or tablet (79.9%) for online education, and the majority of them had issues with the internet network (94.7%). However, only a small portion of people participated in physical leisure activities, with dancing (52.8%)

Table 2 Socio-demographic variable of students (n=338)		
Variables	Frequency	Percentage
Weight gain		
Yes	293	86.7
No	45	13.3
Online duration		
2-6hrs	243	71.9
7hrs and above	95	28.1
Feelings shared during online education		
Yes	249	73.7
No	89	26.3
Sitting arrangements (n=392)		
On Table /Chair	190	56.5
On Sofa	38	11.3
On Bed	121	36.0
On Floor	43	12.8
Problem of internet network		
Always	60	17.8
Often	53	15.7
Sometimes	207	61.2
Never	18	5.3
Type of gadget used		
Mobile /tablet	270	79.9
Laptop/desktop	68	20.1
Physical recreational activity during online education		
Yes	74	21.9
No	264	78.1
Type of recreational activity(n=74)		
Dancing	38	52.8
PT	11	12.5
Yoga	7	9.7
Karate	18	25.0
Perceived feelings of loneliness and isolation during online Education		
Yes	172	50.8
No	166	49.2

the most common. Half (50.8%) of participants felt loneliness and isolation during online education.

Table 3 shows the anxiety, stress and physical health problems of mid adolescent students during online education. The respondent's tends to have minimum anxiety (43.8%), mild anxiety (26.3%), moderate anxiety (21.9%), and severe anxiety (8%). Regarding stress, low perceived stress (10.9%), moderate perceived stress (83.4%) and high perceived stress (5.6%). Likewise, physical health problems during

Table 3 Physical health problem, anxiety and stress among students during online education		
Variables	Frequency(n)	Percentage
Anxiety		
Low anxiety	148	43.8
Mild anxiety	89	26.3
Moderate anxiety	74	21.9
Severe anxiety	27	8.0
Perceived Stress		
Low stress	37	10.9
Moderate stress	282	83.4
High stress	19	5.6
Physical Health Problems		
Eye Problem	176	52.1
Headache	195	57.7
Body ache	193	57.1
Neck pain	186	55.0
Backache	267	79.0

online education include: eye problem (52.1%), headache (57.7%), body ache (57.1%), neck pain (55.0%) and backache (79.0%) among mid-adolescent student.

Table 4 shows the association of both stress and anxiety with perceived feelings of loneliness and isolation during online education i.e., both variables have p value (<0.0001) which denotes highly association.

There were association of neck pain ($p=0.02$) and headache ($p=0.045$) with the duration of online classes per day. Seven hours and more classes per day have shown higher proportion of neck pain (68.4%) and headache (66.3%). Body ache is associated with type of gadget used ($p=0.032$). Students using mobile / tablet (60%) have higher percentage of body ache than laptop/desktop (45.6%) during online education. Headache is also associated with the type of gadget used ($p=0.047$). Student using mobile /tablet (60.4%) have higher percentage of headache than laptop/desktop (49.1%) (Table 5).

Table 4 | Association of anxiety and stress with perceived feelings of loneliness and isolation (n=338)

Perceived feelings of loneliness and isolation during online education	Response	Anxiety		p- value	Stress		p- value
		Normal	Anxiety		Normal	Stressed	
	Yes		83 (48.3%)	89(51.7%)	<0.0001*	49(28.5%)	123(71.5%)
No		86 (51.8%)	80 (48.2%)	86(51.8%)		80(48.2%)	

*p-value for chi Square

Table 5 | Association of physical health problems with duration of online classes and type of gadget used (n=338)

Characteristics	Categories	Neckpain		p- value	Headache		p- value
		Normal	Neckpain		Normal	Headache	
Duration of online Classes per day	2-6 hrs	122(50.2%)	121(49.8%)	0.02*	111 (45.7%)	123(71.5%)	0.045*
	≥ 7 hrs	30(31.6%)	65(68.4%)		32(33.7%)	63(66.3%)	
Type of gadget used	Categories	Body ache		p- value	Headache		p- value
		Normal	Body ache		Normal	Headache	
	Mobile/ Tablet	108(40.0%)	162(60.0%)	0.032*	107(39.6%)	163(60.4%)	0.047*
Laptop/ Desktop	37 (54.4%)	31 (45.6%)	36 (52.9%)		32(49.1%)		

*p-value for chi Square

DISCUSSION

The main purpose of this research was to assess the health impact due to Online education in mid-adolescent student of selective school of Kathmandu during Covid-19 pandemic, 2nd wave. The discussion of the findings according to literature review is done

on the basis of study. In this study, findings revealed that, Eye problem 52.1%, Headache 57.7%, Backache 79%, neck pain 55%, Body ache 57.1%, Mental health (stress 60.1% and anxiety 37.9%). Whereas, In a study of health related problems in online learning in

Nepali universities showed that 35.1% had back pain, 25.7% had neck pain, 55.4% had eye pain, 39.2% had head ache, 27% had anxiety [4]. The findings in this study shows greater impact rather than the study done in Nepali university. This study shows the greater impact in physical health may be due to prolonged, compulsory online classes during 2nd wave as the compared study was done in during 1st wave of the pandemic. But anxiety comparatively was seen more in the compared study than this study. According to this study, anxiety experienced by mid-adolescent student, severe anxiety was 8%, moderate anxiety was 21.9% and mild anxiety was 26.3%. Where as In the study conducted by Megh raj Dangal [14] showed that 18.1% of the respondent were experiencing severe anxiety, 22.9% moderate anxiety and 25.7% mild anxiety. The health issues mainly include stress, severe eyesight problems and insomnia. In the study 55-58% students said that they experienced severe physical strain, eyesight troubles, back ache and headaches. 50% complained stress [13]. According to Megh raj Dangal's study There was a significant association between the university of study and the onset of health problems ($p = 0.045$), which may be due to the number of classes per day or the duration of classes [14]. As compared to this study The association was seen with 9 different variables with p value ≤ 0.05 i.e Perceived Feelings of loneliness and isolation during Online Education with Anxiety and stress; body ache ($p=0.032$) and headache ($p=0.047$) in-relation with type of gadget used, Neck pain($p=0.02$) and head ache($p=0.045$) in-relation with duration of Online Classes per day, Backache($p=0.037$) in-relation with Physical activities, Eye problem($p=0.016$) in-relation with Sitting arrangement during online education. One of the professors from Kathmandu University reported having faced similar health problems (in the online interview) with eye pain and back pain due to long hours of online classes during this pandemic. Teaching the online class was becoming difficult for the professor [14]. Online education in Nepal is a new

way of teaching and learning that needs proper planning, which needs a different teaching modality compared to physical classes. A different approach is needed in making the students feel at ease and more comfortable to learn and reduce their anxiousness during this pandemic situation. Looking at the current situation of online classes in Nepal, radio and television course teaching and online classes are going on, which have been helping a lot to reduce the education gap. However, merely oneway interaction during these media broadcasting courses and online classes seems to be an issue, which hinders the effective learning process. In a nutshell, the health problems seen in this study is quiet similar with previous findings in different literature. This supports that, those listed problems were experienced by mid-adolescent students in the study.

CONCLUSIONS

The study of 338 mid-adolescent students revealed that they experienced both physical and mental health issues while enrolled in online classes. Backache, body ache, neck pain, headache, and eye problems were the most common physical health issues observed. The most common mental health problems were anxiety and stress, with more than 20% of the students reporting moderate levels of both. The study discovered a strong correlation between a number of variables, including perceived loneliness and isolation, sitting positions, the length of time spent taking online classes, physical activity, and the occurrence of these health issues. More than 50% of the students reported having health problems, and more than 80% said they felt moderate stress. These results demonstrate how unsystematic online education has a negative impact on middle-school students. The results point to the need for methodical measures, such as regular breaks, comfort sitting arrangements, and increased physical activity, to reduce the negative effects of online education on mid-adolescent students' physical and mental health.

ADDITIONAL INFORMATION AND DECLARATIONS

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Data Availability: Data will be available upon request to corresponding authors after valid reason.

REFERENCES

1. Corona virus WHO; [Available from: https://www.who.int/health-topics/coronavirus#tab=tab_1.
2. UNESCO. Global monitoring of school closures [Available from: <https://en.unesco.org/covid19/educationresponse#schoolclosures>.
3. UGC. Education Management Information System: Report for Higher Education 2015/16. 2016.
4. Dangal M, Maharjan R. Health Problems Experienced in Online Learning During COVID-19 in Nepali Universities. 2021.
5. Simon Burgess HHS. Schools, skills, and learning: The impact of COVID-19 on education 1 April 2020.
6. Guanghai wang YZ, Jin Zhao, Jun Zhang, Fan Jiang. Mitigate the effects of home confinement on children during the COVID-19 outbreak. *The Lancet*. 2020;395.
7. Health N. Effect of Online Classes on Children's physical health. 2020.
8. Bedewy DG, A. Examining perceptions of academic stress and its sources among university students: the perception of academic stress scale". *Health psychology open*. 2015;2.
9. Counsellor K. Mental Health Effects of Online Learning kentucky counseling center; 2021 [Available from: <https://kentuckycounselingcenter.com/mental-health-effects-of-online-learning/>].
10. Balram A. How online learning can affect student health: the John Hopkins News Letter; April 20 ,2020 [Available from: <https://www.jhunewsletter.com/article/2020/04/how-online-learning-can-affect-student-health>].
11. Schwartz KD, Exner-Cortens D, McMorris CA, Makarenko E, Arnold P, Van Bavel M, Williams S, Canfield R. COVID-19 and student well-being: Stress and mental health during return-to-school. *Canadian Journal of School Psychology*. 2021;36(2):166-85.
12. Online classes: 55% students report health issues. *The Times of India*. 2021 July 25, 2021.
13. Dangal MR, Bajracharya LS. Students anxiety experiences during COVID-19 in Nepal. *Kathmandu University Medical Journal*. 2020;18(2):53-7.
14. Gautam DK, Gautam PK. Transition to online higher education during COVID-19 pandemic: turmoil and way forward to developing country of South Asia-Nepal. *Journal of Research in Innovative Teaching & Learning*. 2021;14(1):93-111.)

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