



VIDEO GAMING AND MEDIA: UNRAVELING THE EFFECTS ON ADOLESCENT WELL-BEING AMIDST THE COVID-19 PANDEMIC

Anoosha Waheed^{1*}, Dr Iram Gul², Ms. Aysha Aneeq³, Dr Sajida Naz⁴, Ms. Tayyaba Hanif⁵

^{1*}Graduate of Department of Behavioural Sciences, Fatima Jinnah Women University, Rawalpindi.
Email: anooshaaheed1998@gmail.com

²Associate professor, Chairperson, Department of Behavioural Sciences, Fatima Jinnah Women University, Rawalpindi, Pakistan. Email: iramgul@fjwu.edu.pk

³Lecturer, Department of Psychology, Capital University of Science and Technology, Islamabad,

⁴Associate Professor, Department of Behavioural Sciences, Fatima Jinnah Women University, Rawalpindi, Pakistan. Email: dr.sajida@fjwu.edu.pk

⁵Lecturer, Department of Humanities, Comsats University, Islamabad, Pakistan

***Corresponding Author:** Anoosha Waheed

*Graduate of Department of Behavioural Sciences, Fatima Jinnah Women University, Rawalpindi.
Email: anooshaaheed1998@gmail.com

Abstract

Numerous research studies have shown that during COVID-19 pandemic media usage and video gaming have increased which has adverse effects on physical and psychological wellbeing of younger generation especially adolescents. The current study was designed to explore the relationship of video games and media with physical and psychological wellbeing of adolescents during COVID-19 pandemic. In this cross-sectional study, the sample was collected from 420 participants (Male=218; Females=202) within the age range of 13-19 years from different educational institutions. Physical and psychological wellbeing were assessed with EQ-5D-5L and General Health Questionnaire (GHQ-12) respectively. Media usage was measured in terms of screen time and pandemic related media consumption/exposure through Screen time questionnaire and Media Use Questionnaire respectively and video gaming was assessed through assessment of Internet and Computer Gaming Addiction Scale (AICA-S). Results revealed that there was a significant positive relationship between screen time, video gaming and media use time and impaired physical and psychological wellbeing. Whereas only video gaming showed a positive correlation with BMI. Hierarchical regression analysis revealed weekday screen time, video gaming, pandemic related media use and media exposure were the significant predictors of psychological and physical wellbeing after controlling for demographic variables. The outcome of the current research emphasized that media and video game usage has adverse effects on physical and psychological wellbeing among adolescents. The study has its implication for mental health policy makers and practitioners who are working on psychological and physical wellbeing of adolescents during COVID-19 pandemic.

Keywords: Media usage, video gaming, screen time, physical wellbeing, Body Mass Index, psychological wellbeing, COVID-19 pandemic.

Introduction

The current study was designed to assess the effects of video games and media on physical and psychological wellbeing of adolescents. This encompasses the introduction about the explanation of the main variables, literature review and rationale of the study. Child development, both physical and psychological, is a lifelong process of growth and this is due to the changes that occur in a child's surroundings. Material that a child consumes from the environment in any form has an impact on the child in one way or the other. Any interaction that the child has with the outside world has an influences on a child; with mobile phones being the most immediate and redundant interactive source, they have an instantaneous and long-term influences. The consumption of media and video enormously contributes in fostering or damaging a child's psychological and physical well-being. Unfortunately, in the past years the world has been affected by a deadly pandemic which has disrupted the lives of people everywhere. In 2019, the first ever case of COVID-19 emerged in Wuhan, China. On December 31 in 2019 the outbreak was reported to the World Health Organization (WHO) and it was officially declared a global emergency the following month. (Cennimo, 2021) During a recent research conducted in Australia 1 in 10 reported to have shown severe symptoms of depression, stress and anxiety which can be attributed to various factors (Traunmüller et al., 2020)

Increase in consumption of video gaming and media usage during COVID-19

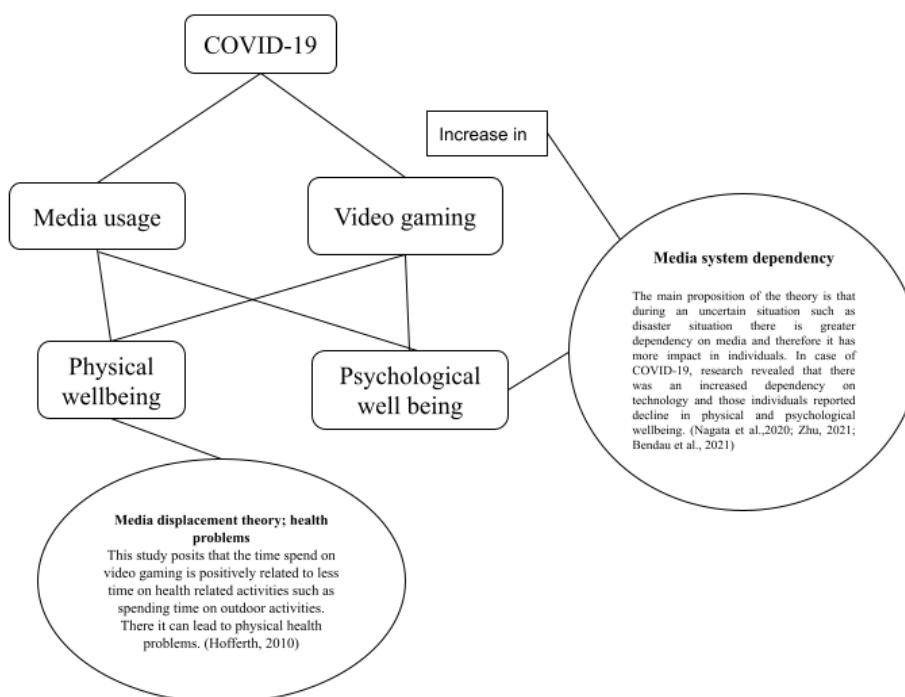
Due to the lockdown situation the work has been shifted to online platforms. Children have to take online classes which has led to an increase in screen time. The children quite frequently seek entertainment and the only available source of entertainment is through online platforms. As the Uses and Gratifications Theory offers an audience-centric perspective, emphasizing that media usage is driven by individuals' needs and desires and amid the COVID-19 lockdowns, it implies that increased media consumption serves various purposes, from combating boredom to facilitating social connections in a socially distanced environment. Hence, the heavy reliance of individuals on technology during COVID-19 Pandemic has made the use of media and technology for the attainment of information and communication purposes inescapable (Pahayahay & Khalili-Mahani, 2020). Video games were used as a way to escape reality. People that were using streaming as a way of coping during the pandemic reported not having good mental health (Pahayahay & Khalili-Mahani, 2020; Shahbaz et al., 2023; Zhu, 2021). Too much screen time usage among children has become a growing concern in today's world. It has many adverse effects on the health of children. A survey, during the pandemic, concluded that media usage has increased among the respondents. (Wold, 2020). There was also an increase in the usage of media, as more people subscribed to Netflix (Rahman, 2021). Pandemic related news in the media is also a factor in causing stress and panic among people. Even though the media has helped massively in the acquisition of information related to pandemic, it has also led to an impact on people's mental health. This can be better explained through Media System Dependency Theory which implies that as individuals increasingly depend on media for various needs, the consequences of media exposure become more pronounced. Cognitive impacts may include shifts in attitudes and belief systems, while behavioral impacts manifest as changes in behavior influenced by the information received through media. Additionally, affective impacts, such as heightened fear and anxiety, are exacerbated by exposure to news about unpleasant events (Lin, 2015). Therefore, media exposure to pandemic related news and consumption of video games has also been on the rise since the emergence of pandemic. This has affected the psychological and physical wellbeing of adolescents. (Xue et al., 2021)

Along with the increment in media consumption there has been an increase in the number of video game users and the time people spent playing online video games (Burdenko & Shchepetov, 2021). The sales of video games and the playing time of the consumers have gone up during the pandemic. According to Nielsen, many gamers admitted to playing more video games during the pandemic in France (Epstein, 2020).

Influence of video games and media on psychological and physical wellbeing

As reported by Super Data more than half of the people in the United States turned towards video games during the lockdown situation. In another study conducted, 71% respondents cited that there has been an increase in the time spent playing video games (Barr & Copeland-Stewart, 2021) and it affects the physical and psychological wellbeing of adolescents. As the media displacement theory posits “people have limited amount of time to spend on the media, the more they spend on one medium less they spend on other medium”. The claim was further supported by a study which indicated that time on video games was positively related to spending less time on health related activities such as sending time on outdoor activities. Individuals that participated in computer games were less involved in sports. (Hofferth, 2010) Due to an increase in the use of commuters, children are less involved in physical activities eventually causing health problems. (Akulwar-Tajane et al., 2020). Hence, highly engaged video gamers experience many psychological and physical problems, such as loneliness and distress and obesity. (André et al., 2020; Kohorst et al., 2018) The sedentary lifestyle due to video gaming all day is also a major cause of obesity among adolescents and children. The postural development in children can also be affected by the hours spent in front of screens. (Certain & Kahn, 2002; Ostbye et al., 1993; Lowry et al., 2002)

Having a deeper inspection of the literature review section it was observed that there are several international studies which studied the relationship of video games and media usage with physical and psychological wellbeing of adolescent. This research study aims to investigate the effect of video games and media usage on physical and psychological wellbeing of adolescents during COVID-19. As during the pandemic this area has not been explored much in the studies conducted in Pakistan. Due to the pandemic most people have turned towards digital technology to relieve their stress but it has been having adverse effect on the mental health in return which they are unaware of. As the previous literature also suggests that in order to gain information about the current situation people turn towards media without checking the authenticity of the information. The news is also shared without any filter due to which there has been a rapid circulation of misinformation related to pandemic among the people which has contributed to the stress and anxiety among people. (Banerjee & Rao, 2020; Bendau et al., 2021; Bhatta et al., 2020; J. Gao et al., 2020) This study examines and notifies people about the detrimental effects of media usage and can serve as a basis to educate people on the matter related to the damaging effects of excessive media consumption on the individual's health. This study will also serve as a foundation in guiding parents to reduce or restrict the unnecessary or excessive usage of video games and media. In addition, this research study affirms or rejects the already existing perceptions about the media and video game usage. The novelty of the study current research study is that very little published research evidence is available specifically on the relationship between media, video games, physical and psychological wellbeing was not available therefore the current research would provide a foundation for future studies on the significance of video games and media usage on physical and psychical wellbeing during COVID-19.



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Aim and Objectives

The main aim of the study is to assess the effect of video games and media usage on physical and psychological wellbeing of adolescents during COVID-19. The aim was further divided into two objectives.

1. To explore the relationship of media usage and video gaming with physical and psychological wellbeing among adolescents during pandemic.
2. To identify the most significant predictors of physical and psychological wellbeing among adolescents during COVID-19 after controlling for demographic variables.

Hypothesis

1. There would be a significant relationship of media usage and video gaming with physical and psychological wellbeing among adolescents during pandemic.
2. Media usage and video gaming will be identified as the most significant predictors of physical wellbeing.
3. Media usage and video gaming would be identified as the significant predictors of psychological wellbeing.

Methods

Convenient sampling strategy was used for data collection procedure. Willing participants from six educational institutes across Rawalpindi and Islamabad were selected to be a part of the research. The individuals taking part in the research must have access to media related devices.

Participants

The participants in the research were adolescents of 13-19 age range. The demographic sheet was provided online in order to collect information regarding the participants. Initially equal number of male and female participants were sought however during the data collection procedure more male participants (n=218) as compared to female participants (n= 202) provided consent and agreed to participate in the research. Therefore final sample consisted of more male adolescents as compared to

¹ Figure 1: Graphical representation of theoretical framework

female adolescents. The total sample size was collected from educational institutes ranging from middle school to universities.

The individuals that were able to understand and provide the informed consent were taken as the sample. People with any kind of cognitive deficit or personality issue were also not considered to avoid the confounding variables.

Measuring instruments

The following instruments were used in the current study along with demographic sheet and informed consent sheet. The consent sheet, demographic sheet and the additional instruments used for assessment among adolescents. Total six scales were used in the data collection procedure. The six instruments included were Screen time questionnaire (Vizcaino et al., 2019), Assessment for Internet and Computer Game Addiction Scale (AICA-S) (Wölfling et al., 2011), Media Use Questionnaire (Xue et al., 2021), GHQ-12 (Goldberg, 1988) and EQ-5D-5L (Herdman et al., 2009) and Body Mass Index (Quetelet, 1830) scale which was assessed through Weight and Height questionnaires included in the demographic sheet.

Information sheet and informed consent

The participants were sent online forms which included the details about the participation criteria. The individual had to agree to the postulated before participating in the research. They had full liberty over consenting for participation.

Demographic sheet

The demographic sheet was attached to the online survey in order to collect information about the participants. The demographic variables includes sex, gender, level of educational, educational sector, presence of chronic illness, weight and height.

Screen time questionnaire

The screen time is an 18-item questionnaire. It was developed by Christopher Wharton and his colleagues and was published in BMC Public Health Journal. The purpose of the instrument is to assess the time spent on devices among the population. That assesses the total hours and minutes a participant spends on five different categories of devices including television, TV-connected devices, computer or laptops, smartphones and tablets during the day, at night and during the weekend. The screen time during day is defined as from when the person wakes up in the morning till he/she goes back to sleep and Weekend day is considered as the time a person spends during Saturday or Sunday on the devices. Total time spent on different devices was then added and converted to minutes. (Vizcaino et al., 2020)

Media Use Questionnaire

Media Use Questionnaire (Chinese version), an 11-item instrument, was used to assess the media exposure to the pandemic related information. This questionnaire was developed during the pandemic. It was divided into two dimensions. First was media use time which assessed the total time a person spent on the past week. The total time of all items was added to give a final media score. The media content items assessed the overall exposure a person has had to pandemic-related news. A likert scale was used to assess the media content items; 1 indicating never and 5 indicating always. The higher score on the scale indicated a higher media consumption. (Xue et al., 2021) The reliability of media use questionnaire was calculated to be $\alpha = .812$.

Assessment of Internet and Computer game Addiction (AICA-S)

This instrument was developed by Klaus Wölfling, Kai W. Müller and Manfred Beutel in 2011. It is a 15 item self-report questionnaire to assess the problematic or addictive behavior among individuals. The instrument included questions related to gaming behaviours of individual. The first item of the questionnaire was qualitative as it was an open-ended questionnaire to assess the time individuals

spend playing video games. 1 of the items was dichotomous. The other items were quantitative as they were assessed through the likert scale. (Wölfling et al., 2011a) The research was conducted to determine the scoring criteria. The 14 were scored. The total scores were from 0 to 14. The cut off score of the instrument was 7. The participants were divided into three categories based on their scores. The individuals with scores ranging from 0 to 6.5 were considered to be non-problematic gamers. The individuals with scores from 7 to 13 were classified as moderate addictive behavior which is considered risky among adolescents, the participants with the scores higher than 13 were labeled as addictive gamers. (Wölfling et al., 2011)

General Health Questionnaire (GHQ-12)

GHQ-12 stands for General Health questionnaire, it was developed by Goldberg & Williams in 1988. This self-administered questionnaire is widely used for screening of psychological disorders among individuals. (Goldberg, 1988) It consists of 12 items and each item is used to assess the severity of mental health problems among participants. It is assessed 4 point likert scale (0-1-2-3). The options range from 0 to 3 which makes the total or highest score that can be obtained by an individual as 36, each one assessing the severity of a mental problem over the past few weeks. The higher score indicates worse condition. The mean score was used as a cut off score to identify cases vs non cases of GHQ-12. The mean score is unique to every study. (Anjara et al., 2020; Goldberg et al., 1998; Zulkefly & Baharudin, 2010) In the current research alphas reliability was found to be Cronbach's alpha= 0.939

EQ-5D-5L

EQ-5D-5L was introduced in 1990 by EuroQol Group. It is divided into two parts EQ-5D descriptive system and EQ visual analogue scale (EQ VAS). The first part can be used to set up a health state profile of an individual. It is used to measure the generic health of individuals by assessing 5 health related aspects. It includes mobility, self-care, usually activities, pain discomfort and anxiety and depression. Level 1 in the table indicates that the individual has no problem, Level 2 indicates slight problems, level 3 suggests moderate problems, level 4 depicting severe problems and level 5 indicates extreme problem exhibiting that the person is unable to do the task. These scores will be combined to form a five digit code. The second part of the questionnaire consists of EQ-VAS (visual analogue scale) consists of a scale ranging from 0 to 100 which measures the health from the persons perspective. How physical unfit do they think they are. 0 indicates the worst health possible and 100 indicates the best health possible. Frequencies and percentages were used to assess the 5 different perceived problem levels in the adolescents. (Herdman et al., 2009)

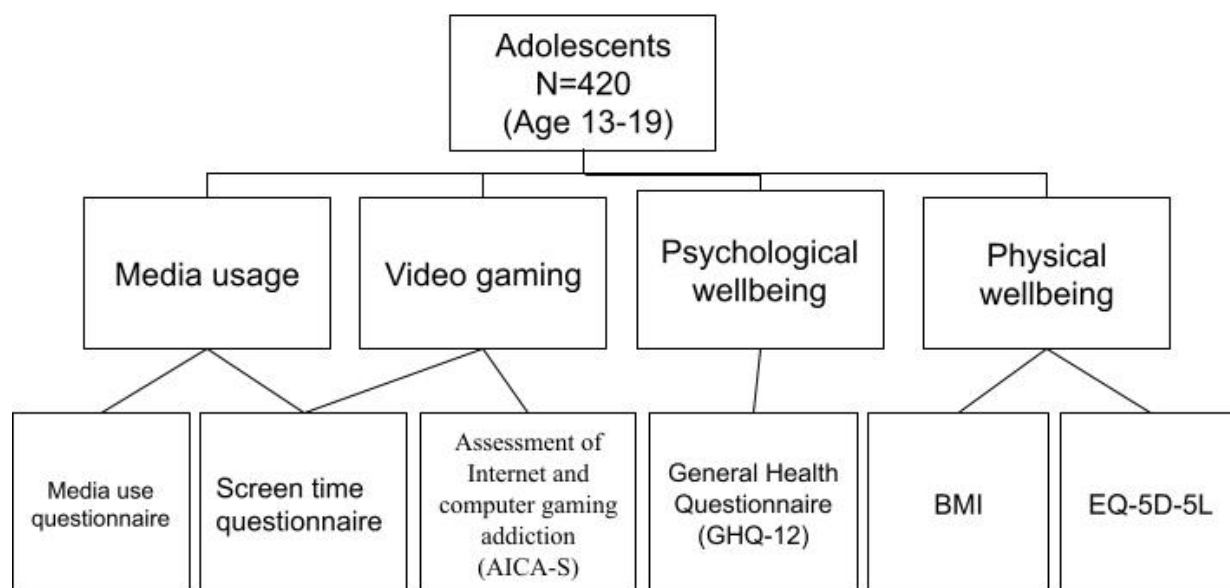
BMI (Body Mass Index)

This scale was introduced around 18th and 19th century by Adolphe Quetelet (1796-1874). BMI stands for 'body mass indicator'. It was also referred to as the 'Quetelet Index'. It is used universally to measure the obesity among individuals. (Hartley, 2012) In order to assess the obesity among adolescents additional questions were included in the demographic sheet namely height and weight. BMI was calculated by dividing weight in kg with height in m², the actual BMI score was then presented in kg/m². BMI scores were then categorized into 4 categories below 18.5 were labelled underweight, 18.5 – 24.9 normal weight, 25.0 – 29.9 overweight, 30.0 and above were overweight.

Study design

The cross sectional study design was conducted to assess the relationship of video games and media usage games with physical and psychological wellbeing among adolescents during COVID-19. This research design was chosen due to the lack of research done on the topic during COVID-19 in the Pakistani society and the increase in reliance of video games and media usage during the pandemic. We opted for this study design because to gain an insight about the adverse effects of video games and media usage on physical and psychological wellbeing of adolescents during the COVID-19 pandemic. For this study the data was collected through online platform from adolescents between

the age ranges of 13-19 from six different institutes. Fatima Jinnah issued the reference letters which were used to take permission from the educational institutes in order to conduct the research study.



Ethical consideration

The topic was approved from university's ethical committee. Official permission was taken from universities for the collection of data. The synopsis of the study and study protocols were provided to the universities in order to get official permission for data collection. Signed informed consent was taken from the participants and purpose was explained to the participants before participating in the research. Every participant was assured about the confidentiality of the research provided by them. It was also mentioned to the participants that they can leave the study at any point during the data collection. Although adults with prior history of any chronic psychological disorder were not included in the study however the researcher was prepared to handle any kind of psychological distress which may arise during the administration of protocols. It was also decided that in case of extreme psychological distress participants would be referred to appropriate mental health profession.

Results

Sociodemographic characteristics of adolescents during COVID-19.

Figure 2

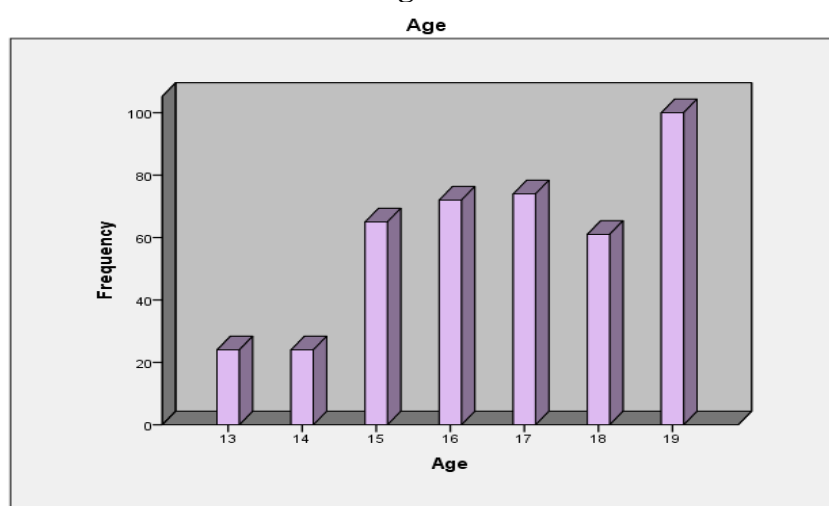


Figure 3

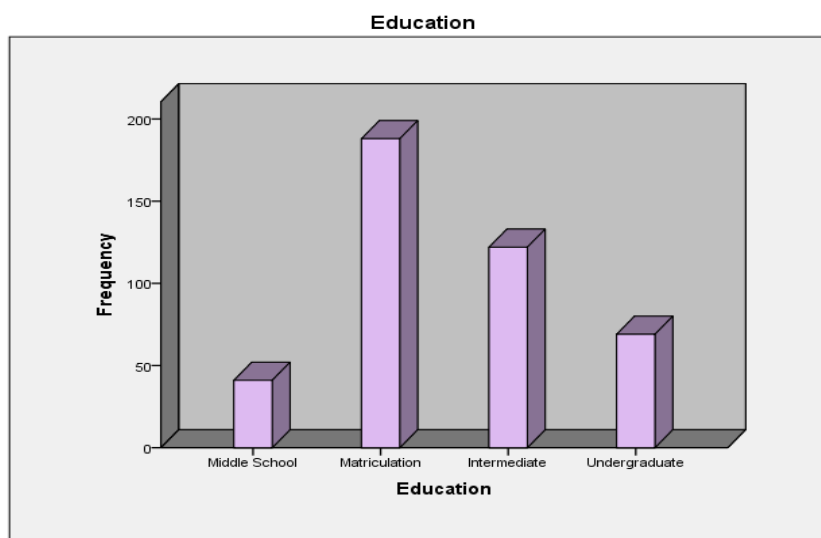


Figure 4

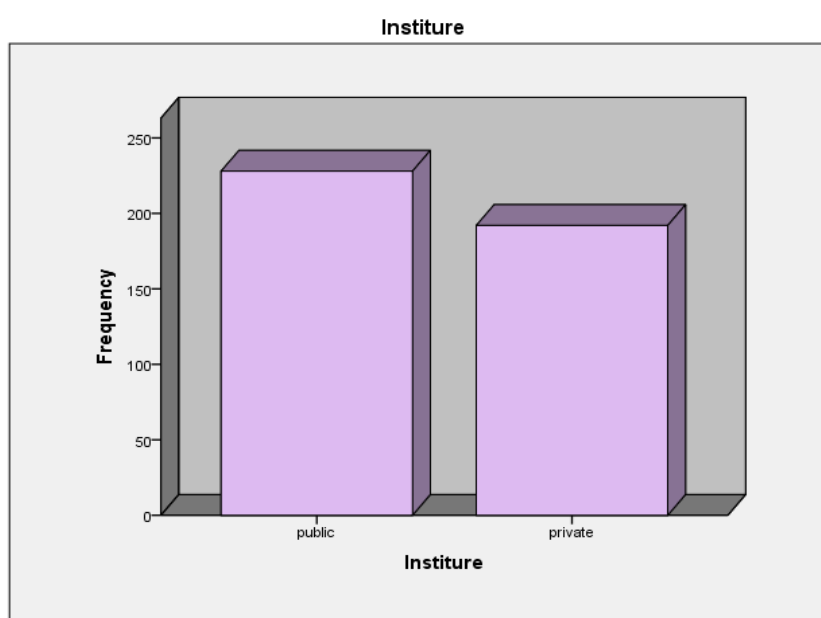


Figure 5

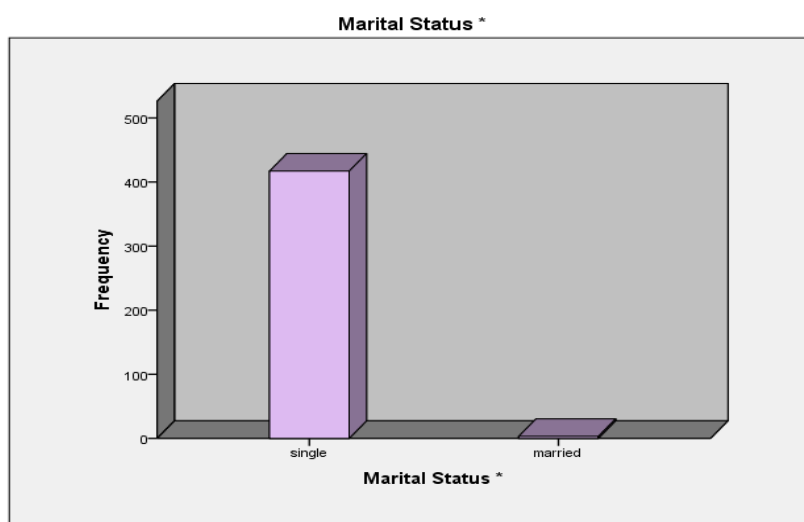
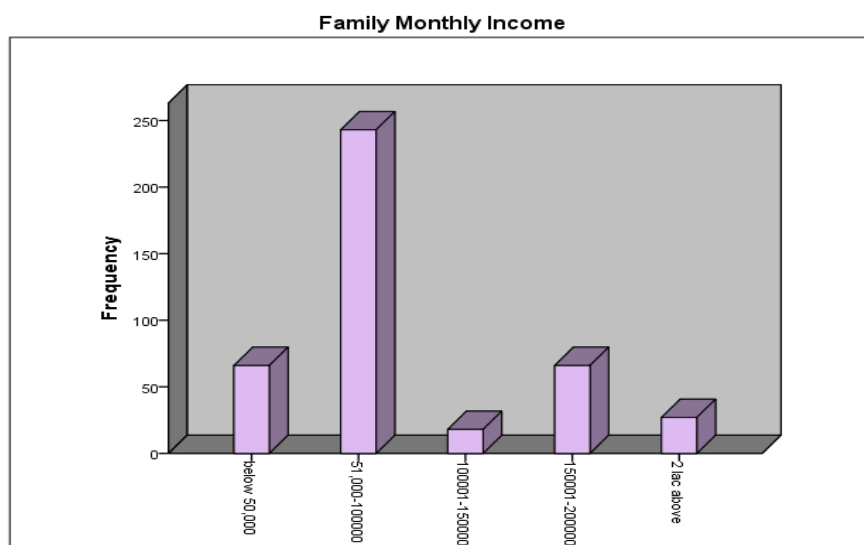
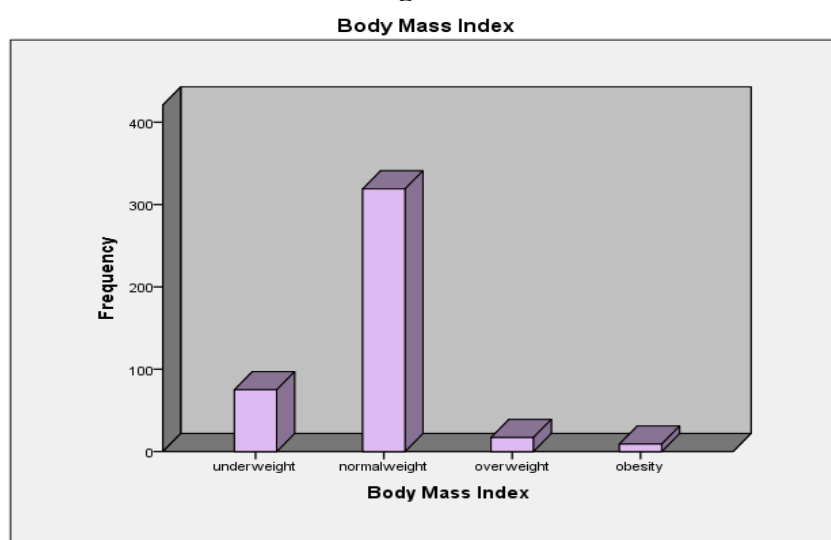


Figure 6**Figure 7**

The socio demographic of the total 420 participants shows that females (n=202; 48.1%) and males (n=218; 51.9%). The frequency of the. The mean age of the participants is 16.74 (SD=1.81). The educational status of the participants includes four categories; Middle School (n=41; 9.8 %), Matriculation (n=188; 44.8%), Intermediate (n=122; 29 %) and Undergraduate (n= 69; 16.4%). 228 (54 %) belonged to public sector whereas 192 (45 %) belonged to private sectors. 417 adolescents (99.3%) reported their marital status as single whereas 3 participants (.7%) reported to be married. BMI of the individual was also assessed, the Body Mass Index scores were divided into four further categories. Underweight (n=75; 17.9%), Normal Weight (n=319, 76%), Overweight (n=17; 4%) and obese (n=9; 2.1%). BMI scale was used to assess the physical wellbeing of adolescents. BMI scores suggested that out of total 75 (17.9 %), 50 males (22.9%) and 25 (12.4%) were underweight. 319 (76 %) participants, male 156 (71.6%) and females 163 (80.7%) reported to have normal weight, 17 (4 %) people, male 8 (3.7%) and females 9 (4.5%) fell under the category of overweight and 9 (2 %), males 4 (1.8%) and females 5 (2.5%) were obese.

Assessment of screen time usage of TV, TV-connected devices, laptops, smartphones and tablets among adolescents during COVID-19 pandemic

The table (1) describes the screen time assessment in terms of TV, TV connected devices, laptop, smartphones and tablets based on the scores of screen time questionnaire among adolescents during

pandemic. The screen time questionnaire assess the time individual spends across five different gadgets on a regular weekday and on weekends.

Table 1 Median, frequency and percentage of screen time usage based on the scores of screen time questionnaire. (N=420)

Screen time		Light users			Moderate users			Heavy users		
		Median	Frequency	Percentage	Median	Frequency	Percentage	Median	Frequency	Percentage
Weekday screen time	TV	60	265	63 %	120	121	28.8 %	480	34	8 %
	TV connected devices	60	170	40.5 %	180	149	35.5 %	480	101	24 %
	Laptop/Computer	120	153	36 %	240	223	53 %	600	44	10.5 %
	Smartphone	180	274	65 %	200	12	2.9 %	540	134	31.9 %
	Tablet	60	204	48 %	-	-	-	360	217	51 %
Weekend screen time	TV	60	345	82 %	120	58	13.8 %	420	17	4 %
	TV connected devices	60	228	54.3 %	180	163	38.8 %	480	28	6.7 %
	Laptop	150	349	83 %	180	64	15.2 %	540	7	1.7 %
	Smartphone	180	355	84.5 %	240	28	6.7 %	580	37	8.8 %
	Tablet	60	367	87.4 %	-	-	-	300	53	12.6 %

Note. Categories shown were created based on reported screen time viewing by device, except for tablet; light users $\leq 33.33^{\text{th}}$ percentile, moderate users $> 33.33^{\text{th}} - 66.66^{\text{th}}$ percentiles, and heavy users $\geq 66.66^{\text{th}}$ percentile. Tablet users were divided into light and heavy based on $\leq 50^{\text{th}}$ due to less sample in moderate use category.

The participants were asked to report their screen time by different types of screens in minutes per day. During weekdays, across television screen time, 265 (63%) people fell under the category of light users, 121 (28.8%) people under the category of moderate users and 34 (8%) people under heavy users. Across screen time of TV connected devices, 170 (40.5%) participants lied under the category of light users, 149 (35.5%) under the category moderate users and 101 (24%) under the category of heavy users. Under the screen time of laptop/computer, 153 (36%) participants were light users, 223 (53%) were moderate users and 44 (10.5%) were heavy users. In screen time of smartphones, 274 (65%) participants were light users, 12 (2.9%) were moderate users and 134 (31.9%) were heavy users. In the screen time of tablets, 204 (48%) came under the category of light users, 217 (51%) under the category of heavy users while there were no participants under the moderate category.

On the weekends, across the screen time of television, 345 (82%) people were light users, 58 (13.8%) were moderate users and 17 (4%) were heavy users. Taking a look at the screen time of TV connected devices, 228 (54.3%) participants lied under the category of light users, 163 (38.8%) under moderate users and 28 (6.7%) under heavy users. Upon examining the screen time of laptop/computer, 349 (83%) individuals came out to be light users, 64 (15.2%) came out to be moderate users and 7 (1.7%) came out to be heavy users. Under the screen time of smartphones, 355 (84.5%) fell under the category of light users, 28 (6.7%) were moderate while 37 (8.8%) were heavy users. At the end, in the screen time of tablets, 367 (87.4%) were light users, 53 (12.6%) were heavy users and no participants fell under the category of moderate use.

Assessment of exposure to pandemic related media, internet and computer game addiction among adolescents during COVID-19 pandemic

Table 2 describes the pandemic related media use time and media content based on the scores of media use questionnaire and AICA-S respectively among adolescents during COVID-19 pandemic.

Table 2 Frequency and percentage of media use, media exposure and level of video gaming among adolescents during pandemic based on the scores of media use questionnaire and Internet and Computer Gaming addiction (AICA-S) respectively (N=420)

Media use	Percentile	Categories	Frequency	Percentage
Media use time	25	Light use/ involvement	106	25.2 %
	50	Moderate use/ involvement	104	24.7 %
	75	Heavy use/ involvement	109	25.9 %
	75 above	Extreme use/ involvement	101	24 %
Media content	25	Low media exposure	144	34.2 %
	50	Moderate media exposure	85	20.2 %
	75	High media exposure	97	23 %
	75 above	Extreme media exposure	94	22.3 %
Video gaming	Percentile	Categories	Frequency	Percentage
	0.0 – 6.5	Non problematic	217	51.7 %
	7.0 – 13.0	Moderate addicted behavior	103	24.5 %

The results of media use questionnaire were calculated on the bases of percentile. Based on 25th percentile scores for exposure to media use (n=106; 25.2 %) and media content (n=144; 34.2 %). For 50th percentile media use time (n =104; 24.7 %) exposure to media content (85; 20.2 %). 75th percentile media use time (n= 109; 25.9 %) and media content (n= 97; 23 %). For 75 and above percentile media use time (n= 101; 24 %) and media content exposure (n= 94; 22.3 %).

The assessment of AICA-S demonstrated that out of 420 participants (217/420; 51.7 %) were non problematic gamers (score < 6.5), (103/420; 24.5 %) were moderately addicted gamers (score 7.0-13.0) and (100/420; 23.8 %) were addicted gamers (score 13.5- 27.0).

Assessment of physical and psychological wellbeing of adolescents during COVID-19 pandemic

Table (3) demonstrates the physical wellbeing in terms of mobility, self-care, usual activity, pain/discomfort and psychological distress. It is divided into two parts. The first part can be used to set up a health state profile of an individual. It is used to measure the generic health of individuals by assessing 5 health related aspects. The 5 levels range from no problem to extreme problems. Level 1 in the table indicates that the individual has no problem, Level 2 indicates slight problems, level 3 suggests moderate problems, level 4 depicting severe problems and level 5 indicates extreme problem exhibiting that the person is unable to do the task. The second part of the questionnaire consists of EQ-VAS (visual analogue scale) is used to assess the health. The score of the health index ranged from 0 to 100, with higher value indicating better health.

Table 3 Frequency and percentage of levels of physical and psychological wellbeing among males and females based on scores of EQ-5D-5L and GHQ-12 respectively (N=420)

Physical wellbeing		Male		Female		Total	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Mobility	Level 1	86	39.4%	88	43.6 %	174	41.4%
	Level 2	94	43.1%	93	46 %	187	44.5 %
	Level 3	27	12.4%	16	7.9%	43	10.2 %
	Level 4	10	4.6%	5	2.5%	15	3.6 %
	Level 5	1	0.2%	0	0.0%	1	.2 %
Self-care	Level 1	119	54.6%	122	60.4%	241	57.4 %
	Level 2	47	21.6%	62	30.7%	109	26 %
	Level 3	49	22.5%	17	8.4%	66	15.7%
	Level 4	0	0.0%	1	0.5%	1	.2%
	Level 5	3	1.4%	0	0.0%	3	.7 %
Usual Activities	Level 1	94	43.1%	73	36.1%	167	39.8 %
	Level 2	73	33.5%	66	32.7%	139	33 %
	Level 3	23	10.6%	52	25.7%	75	18 %

	Level 4	25	11.5%	11	5.4%	36	8.6 %
	Level 5	3	1.4%	0	0.0%	3	.7 %
Pain and discomfort	Level 1	76	34.9%	42	20.8%	118	28 %
	Level 2	71	32.6%	89	44.1%	160	38 %
	Level 3	44	20.2%	61	30.2%	105	25 %
	Level 4	25	11.5%	7	3.5%	32	7.6 %
	Level 5	2	0.9%	3	1.5%	5	1.2 %
Psychological distress	Level 1	38	17.4%	22	10.9%	60	14.3 %
	Level 2	32	14.7%	54	26.7%	86	20.5 %
	Level 3	53	24.3%	50	24.8%	103	24.5 %
	Level 4	63	28.9%	36	17.8%	99	23.6 %
	Level 5	32	14.7%	40	19.8%	72	17 %
Psychological wellbeing	Male		Female		Total		
	Frequency		Percentage	Frequency	Percentage	Frequency	Percentage
	Above cut off	100	45.8%	98	48.5 %	200	47.6%
	Below cut off	118	59.4 %	104	51.4 %	220	52.3 %

In EQ-5D-5L, the Frequencies and percentages were used to assess the 5 different perceived problem levels in adolescents. In mobility total N=174 (41.4%), 86 males (39.4%) and 88 % females (43.6 %) reported that they have no trouble walking. Out of N=420, total 187 (44.5%), 94 males (43.1%) and 93 females (46 %) reported that they have slight trouble walking, 43 (10.2 %), 27 males (12.4%) and 16 females (7.9%) reported to having moderate problem while walking, 15 (3.6 %), 10 males (4.6%) and 5 females (2.5%) reported that they have severe trouble walking and 1 (.2 %) people, 1 male (0.2%) and 0 female reported that they are unable to walk.

In self-care 241 (57.4 %), 119 males (54.6%) and 112 females (60.4%) reported no problem in taking care of themselves. 109 (26 %), 47 male (21.6%) and 62 female (30.7%) participants reported slight problem looking after themselves. 66 (15.7%), 49 males (22.5%) and 17 females (8.4%) reported having moderate problem in self-care, 1 (.2%), 0 males and 1 female (0.5%) reported to having severe difficulty taking care of themselves whereas 3 (.7 %), 3 males (1.4%) and 0 females said they were unable to take care of themselves.

In the third dimension usual activities 167 (39.8 %), 94 males (43.1%) and 73 females (36.1%) reported to having slight problem in taking care of themselves, level 2 contained 139 (33 %) people, 73 male (33.5%) and 66 females (32.7%) indicating that they have slight problem doing usual activities. 75 (18 %), 23 males (10.6%) and 52 females (25.7%) were placed in level 3 indicating they have moderate problem doing usual activities. 36 (8.6 %) people, 25 males (11.5%) and 11 females (5.4%) came under level 4, specifying that they have severe problem doing usual activities. Only 3 (.7 %) participants, 3 male (1.4%) and 0 females reported that they were unable to perform usual activities,

The fourth dimension was pain/Discomfort 118 (28 %), 76 males (34.9%) and 42 females (20.8%) came under level 1, since they reported to having no problem moving around. 160 (38 %), 71 males (32.6%) and 89 females (44.1%) were included in level 2, showing they have slight pain and discomfort. Level 3 included 105 (25 %), 44 males (20.2%) and 61 females (30.2%), level 4 included n= 32 (7.6 %), 25 males (11.5%) and 7 females (3.5%) and level 5 included 5 (1.2 %), 2 males (0.9%) and 3 females (1.5 %) who reported to having extreme pain and discomfort.

In the fifth dimension, psychological distress was assessed. Level 1 included 60 (14.3 %), 38 male (17.4%) and 22 female (10.9%) participants, level 2 included n= 86 (20.5 %), 32 males (14.7%) and 54 females (26.7%) showing slight psychological distress, 103 (24.5 %), 53 males (24.3%) and 50 females (24.8%) came under level 3, level 4 included n=99 (23.6 %), 63 males (28.9%) and 36 females (17.8%) , and 72 (17 %), 32 males (14.7%) and 40 females (19.8%) , reported high level of anxiety and distress hence were categorized under level 5.

For EQ-VAS the mean, standard deviation, median, frequencies and percentage were used. The central tendencies such as mean was used to mark out a cut off score for the scale. 235 (55.9 %), 100 (45.87%) males and 109 (52.96%) females, people scored above the mean which indicating the presence of health problems.

The scores of GHQ-12 indicated that overall 220 participants (52.3 %), 118 (59.4 %) males and 104 (51.4 %) females, scored above the mean score indicating worse health and 200 (47.6%), 100 (45.8%) males and 98 (48.5 %), scored below the mean score indicating better general health.

Relationship between media, video games, physical wellbeing, psychological wellbeing and BMI among adolescents during COVID -19 pandemic

Correlation analysis was assessed using Pearson correlation coefficient for normally distributed data to test the research hypothesis. The correlation was used to measure the strength of the relationship between the study variables. The Values of correlation ranges from 0 - ± 1 where the values which are closer to 0 indicates a weaker relationship while those closer with ± 1 shows a stronger relationship. The \pm shows the direction of the relationship that whether it is positive or negative. (Ratner, 2009) Person correlation was used to assess the relationship between media use scale, screen time scale, video gaming scale, physical wellbeing and psychological wellbeing.

Table 4 *Pearson correlation between media, video games, physical wellbeing, psychological wellbeing and BMI among adolescents (N=420)*

	1	2	3	4	5	6	7	8
	r	r	r	r	r	R	r	r
1 Weekday screen time	--	.65**	.17**	.07	.51**	-.03	.45**	.45**
2 Weekend screen time	--	---	.37**	.16**	.52**	-.02	.47**	.52**
3 Media use	--	---	---	.39**	-.02	.02	.17**	.33**
4 Media content	--	---	---	---	-.00	.03	.12*	.29**
5 Assessment of internet and computer gaming addiction (AICA-S)	--	---	---	---	---	.10*	.76**	.68**
6 BMI	--	---	---	---	---	---	.13**	.12*
Physical wellbeing (EQ-5D-5L)	--	---	---	---	---	---	---	.76**
7 Psychological wellbeing (GHQ-12)	--	---	---	---	---	---	---	---

r=correlation; ** Correlation is significant at $p < 0.01$ (sig 2-tailed); * Correlation is significant at $p < 0.05$ (sig 2-tailed)

The table shows that there is no significant correlation between Weekday screen time and BMI ($r(420) = -.03$, $p < 0.01$). Weekday screen time has significant positive relation with physical wellbeing ($r(420) = .13$ **, $p < 0.01$) and psychological wellbeing ($r(420) = .12$ *, $p < 0.01$). The table shows that there is no significant correlation between Weekend screen time and BMI ($r(420) = -.02$, $p < 0.01$). Weekend screen time has significant positive relation with physical wellbeing ($r(420) = .47$ **, $p < 0.01$) and psychological wellbeing ($r(420) = .52$ **, $p < 0.01$).

The table shows that there is no significant correlation between media use time and BMI ($r(420) = .02$, $p < 0.01$). Media use time has significant positive relation with physical wellbeing ($r(420) = .17$ **, $p < 0.01$) and psychological wellbeing. ($r(420) = .33$ **, $p < 0.05$) The table shows that there is no significant correlation between media content time and BMI ($r(420) = .03$, $p < 0.01$). Media content

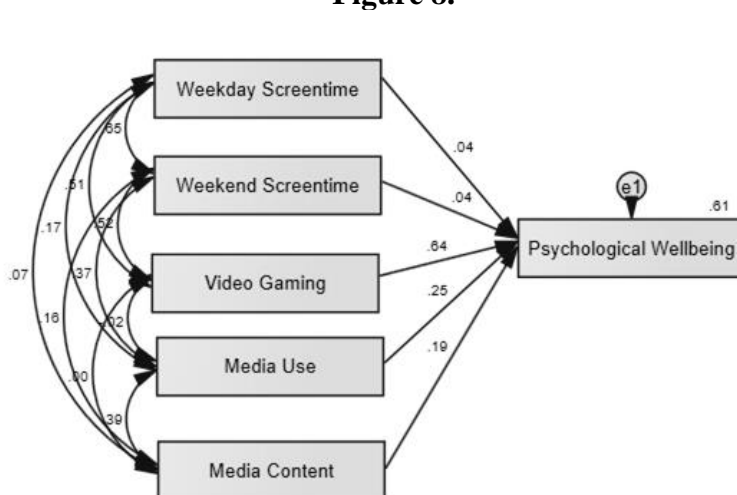
has significant positive relation with physical wellbeing ($r(420) = .12^*$, $p < 0.05$) and psychological wellbeing ($r(420) = .29^{**}$, $p < 0.01$)

The table shows that there is a significant correlation between internet and computer gaming behaviour and BMI ($r(420) = -.10^*$, $p < 0.05$). Internet and computer gaming addiction has significant positive relation with physical wellbeing ($r(420) = .76^{**}$, $p < 0.01$) and psychological wellbeing ($r(420) = .68^{**}$, $p < 0.01$)

Psychosocial predictors of psychological wellbeing among adolescents during COVID-19 pandemic

Hierarchical multiple regression analysis was conducted to find the significant predictors of in the current study. The assumptions of the study were studied to checked before analysis was run (Bonanno, et al., 2007; William et.al, 2007). The variables were entered in the regression model in the following order. Hierarchical Multiple Regression was carried out to identify the significant predictors of psychological wellbeing. Variables that are added in the regression model follow the given order i.e. in block I, Sociodemographics are added as they are fairly stable characteristics and in block II, screen time use, media use time, media content and video gaming were generated because they were fairly unstable characteristics. Structured equation model also corroborated the results.

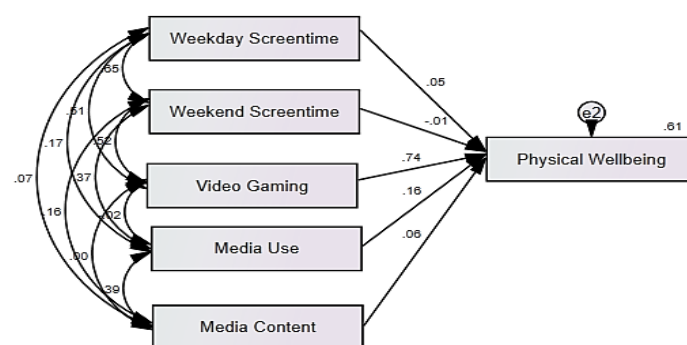
Figure 8.



Regression and structured equation model explained 61 % (.61*100) of variance. Regression model revealed weekday screen time ($\beta = .04$, $p = .04$), internet and computer gaming addiction ($\beta = .64$, $p < .001$), pandemic related media use ($\beta = .25$, $p < .001$) and media content ($\beta = .19$, $p < .001$) are predictor variables for psychological wellbeing. Weekend screen time did not show any significant values. The structured equation model further substantiated the results.

Psychosocial predictors of physical wellbeing among adolescents during COVID-19 pandemic

Hierarchical Multiple Regression was carried out to identify the significant predictors of physical wellbeing. Variables were added in the regression model in the same order. Structured equation model was also applied which supported the results of hierarchical multiple regression.

Figure 9.

Regression and squared multiple correlation was .61 for life psychological wellbeing that shows 61 % of variance of physical wellbeing is accounted by weekday screen time, weekend screen time, video gaming, media use and media content. The study assessed the effect of screen time, video gaming and media on the psychological wellbeing of adolescents. Weekday screen time ($\beta = .05$, $p=.04$), internet and computer addiction ($\beta = .74$, $p<.001$), media use ($\beta = .16$, $p=.01$) and media content ($\beta = .06$, $p=.02$) were identified as predictor variables for physical wellbeing (EQ-5D-5L) whereas weekend screen time did not show any significant values.

Discussion

The present research was designed to assess the effect of video games and media usage on physical and psychological wellbeing of adolescents during COVID-19 pandemic. The study employed Pearson correlation and hierarchical regression to investigate the correlation and effect of video game and media usage on the physical and psychological well-being of adolescents during the COVID-19 pandemic. The primary hypothesis posited that higher video game and media usage would correlate with increased physical health problems. The results of the regression and correlation analyses demonstrated adverse effects of screen time, media use, and video games on physical well-being. Notably, a minute correlation between BMI and video gaming was identified, therefore a separate regression model was not made for BMI.

Contrary to previous beliefs that increased screen time leads to obesity, the present research did not find a significant correlation between screen time and BMI, challenging established notions (Rosiek et al., 2015). However, it was observed that Internet and computer addiction exhibited a strong positive correlation with BMI, aligning with previous research indicating a link between video gaming and obesity (Chaput et al., 2011; Kohorst et al., 2018). Participants separately reported weight gain during the pandemic due to reduced physical activity and increased sedentary behavior as well, corroborating findings from Kohorst et al. (2018). Additionally, the study highlighted the positive correlation between video gaming addiction and health problems, supplementing the detrimental consequences associated with excessive gaming (Shirley et al., 2018). The hierarchical regression analysis identified video games ($\beta = .62$, $p<.001$) and Weekday screen time ($\beta = .08$, $p=.05$), as significant predictors of physical health problems (mobility, usual activities, self-care, pain/discomfort and psychological distress). This aligns with Vizcaino et al.'s (2020) findings, where heavy screen time users exhibited the worst health-related characteristics. Categorizing screen time into heavy, moderate, and light use, the research demonstrated that weekday screen time significantly predicted impaired physical well-being, reinforcing the importance of monitoring screen time during the pandemic (Vizcaino et al., 2020; Akulwar-Tajane et al., 2020).

For psychological well-being, this study employed Pearson correlation and hierarchical regression, utilizing the General Health Questionnaire (GHQ-12) to assess anxiety/depression, social dysfunction, and loss of confidence. The research found a significant correlation between addicted video gaming behavior and impaired psychological well-being, supporting previous research indicating heightened psychological distress among highly engaged gamers (André et al., 2020).

Moreover, the study revealed a positive correlation between increased screen time, pandemic-related media consumption, and impaired psychological well-being, aligning with the findings of two studies carried out in 2020 concluded that high social media exposure during COVID-19 pandemic leads to mental health problems. Due to infodemics participants reported to having high prevalence of depression and anxiety. Moreover, it was observed that addicted internet gaming disorder is positively correlated with loneliness and panic disorder. (Gao et al., 2020; Sundaray & Chopra, 2020). Therefore as suggested by Colley et al.'s (2020) restricting screen time contributes to better psychological health. In terms of predictors, hierarchical regression analysis revealed addicted video gaming behavior ($\beta = .64$, $p < .001$) as a significant predictor of psychological well-being, consistent with literature suggesting a prevalence of psychological problems among children due to digital media use (Twenge, 2020; Twenge et al., 2019). Additionally, increased media use ($\beta = .25$, $p < .001$) and pandemic-related media content ($\beta = .25$, $p < .001$) and weekday screen time ($\beta = .04$, $p = .04$), emerged as significant predictors, reinforcing the existing literature on the adverse implications of increased electronic device usage during COVID-19 on physical and psychological wellbeing on mental health (Bendau et al., 2021; Sheen et al., 2020).

Conclusion

This study highlights video games and media usage as significant predictors of physical and psychological wellbeing among adolescents during COVID-19. This research highlights the serious repercussions video games and media is having on the physical and psychological wellbeing of adolescents. Although this study covered broad range of topics and tried to study the effects of video games and media usage on physical and psychological wellbeing during COVID-19 pandemic in detail but no study is without limitations. We were not able to include some factors related to COVID-19 pandemic such as family dynamics, family relations. In future studies these factors should also be included. Moreover, it was a cross sectional study design conducted in a short period of time. In future, prospective cohort, longitudinal and cross cultural studies should be conducted in order to assess the impact of media and video games on physical and psychological wellbeing over the period of time and in different cultures. In future some mixed method research studies must be conducted. We should identify some of the qualitative aspects of these variables. The psychological factors such as COVID-19 related psychological distress and other factors that are specifically related to COVID-19. In future studies we should see how these factors have an effect on the physical and psychological wellbeing. It is important to conduct some randomized control trials. Two groups of individuals who are addicted to media usage and video gaming and apply certain therapeutic intervention to see what effect it has on psychological. The groups that score high on internet and video gaming addiction and have impaired physical and psychological wellbeing should be taken, and a randomized control trial should be conducted to determine the therapeutic interventions that would be needed in dealing with such issues. It is not only important to identify the factors related to impaired psychological and physical wellbeing. It is also important to identify the counseling techniques or the therapeutic interventions that can be used to deal with such adolescents. That is why randomized control trials must be conducted. This study can assist future researchers to explore the detrimental effects of video games and media usage among adolescents. These factors are usually considered as a myth and dismissed while assessing the causes of physical and psychological wellbeing of adolescents but serious extensive exploration is required into this pressing issue.

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