IJPSR (2024), Volume 15, Issue 1 (Research Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 02 June 2023; received in revised form, 31 July 2023; accepted, 21 November 2023; published 01 January 2024

COVID-19 AND PHYSICAL ACTIVITY LEVELS AMONG PHARMACY STUDENTS: THE IMPACT OF VIDEO GAMING

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Keywords:

Video gaming, Physical activity, Pharmacy student, Sedentary behavior, COVID-19

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ABSTRACT: Video games can be symbolized as an escapism from the anxiety and pressure during the COVID-19 pandemic where social distancing is inevitable. Their growing popularity over the past decade has built the questions on how they might affect the physical health of the population. Our study aimed to determine the physical activity level with the frequency of exposure to video gaming among the pharmacy students during the pandemic. The cross-sectional study was conducted using an online survey consisting of a set of validated questionnaires modified from published literatures and the International Physical Activity Questionnaire (iPAQ) among the students at the Faculty of Pharmacy, Universiti Teknologi MARA. The survey was distributed to the students via e-mail and social network from April until June 2020 amid the Movement Control Order. A total of 314 sample were collected and majority of the respondents were females (55.1%) and Malay (96.5%). Our results showed that most students spent an average of 1 to 3 days per week playing video games (48.1%), with the frequency of playing for up to 3 hours (70.9%). Unsurprisingly, very few admitted to having frequently performed rigorous (2.9%) or moderate activities (7.1%). Although approximately one-third of respondents (36.6%) spent an average of more than 8 hours per week sitting or lying down, half of them (51.3%) reported that they had never experienced any pain after playing video games. Our findings highlight that video gaming did not cause significant harm to the students despite the low level of physical activity among the pharmacy students.

INTRODUCTION: Due to the fast and global spreading of the highly infectious severe acute respiratory syndrome coronavirus 2 (SARS Cov-2), many protective measures are encouraged as precautions against the virus to flatten the curve such as by increasing hygiene level, wearing face mask, avoiding face-to-face interaction, self-isolating and quarantining at home.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.15(1).202-08

This article can be accessed online on www.ijpsr.com

DOI link: https://doi.org/10.13040/IJPSR.0975-8232.15(1).202-08

Many have opted to embrace the new norms until the arrival of a new coronavirus vaccine, which could take years to be fully developed. On 18 March 2020, the Malaysian Government has taken the measure to contain the pandemic via the Movement Control Order (MCO) after the first reported case on 24th January 2020 [1].

Stricter movements, travel restrictions and home quarantine are the new experiences that can affect mental and physical health. For some people, playing video games is one of the various ways to combat loneliness during the lockdown period.

According to the market research firm The NPD Group, the video games sales had gone through the roof from USD 2.4 billion to 3.3 billion in August 2020 [2]. Video games have evolved over the years to becoming a part of the social activities ever since their creation from just a simple push of a lever and button on an oscilloscope. They can be signified as an escapism from the anxiety and pressure especially during the coronavirus disease 2019 (COVID-19) pandemic whereby social distancing is inevitable. This is especially crucial in combating stressing factors associated with the various negative impact of COVID-19 lockdown such as post-traumatic stress [3], financial loss [4], hunger [5] and confusion [6]. Today, it is hard not to spot how much video games are gaining their popularity among the younglings and even the aged individuals to some extent. The enjoyment of video game is elevated from the creation of amazing technologies that have grown exponentially to newer platforms, allowing them to be played in various ways using the consoles, handheld portables, smartphones and computers. It is estimated that there are approximately 2.7 billion active video gamers worldwide, and the figure is expected to rise to over 3 billion gamers by 2023 [7].

Video games are conventionally linked to the risk of obesity among children and associated with sedentary behaviour. In addition, the increased level of aggression among adolescents can be seen with certain types of violent games [8–10]. Contrary to normative belief, recent trends have shown that video games can in fact boost player's physical activity and benefit mental health. Despite classifying the video game addiction as an official mental health disorder in 2019, the World Health Organization (WHO) is promoting them through its #PlayApartTogether campaign to encourage people keep socializing while staying at home. The campaign is jointly supported by major video game companies such as Microsoft, Sega, Twitch and Activision Blizzard. It was described that video gamers commonly have rather improved cognitive functions associated with better hand-eye coordination, level of attention and ability to focus [11–13]. Physical activity as defined by WHO is the movement of the body from the result of skeletal muscles that needs energy usage which can benefit the body on a variety of ways.

Akin to regular outdoor activities, active video games (AVG) or exergaming which require usage of energy to fulfil the necessary physical movements could be effective at summoning intense physical activity *via* total body participation of the players [14, 15]. This is particularly important in minimizing the risk of developing primary and secondary chronic diseases among the young individuals including hypertension [16, 17], diabetes [18] and cardiovascular disease. The positive relationship between video gaming and physical activity could produce encouraging results by enabling people to be socially connected to each other while maintaining physical fitness, mainly during this pandemic crisis where everybody is forced to stay indoors. Our study aimed to determine the physical activity level with the frequency of exposure to video games among the pharmacy students during the current outbreak situation in Malaysia.

METHOD:

Study Design and Participants: This cross-sectional study was conducted using an online survey. Participants were recruited from the student population *via* convenience sampling. The inclusion criteria for the study included: (1) adult 18 years old and above; (2) video gamer and; (3) able to read in English or Malay. The questionnaires used in this study were modified from the International Physical Activity Questionnaire (iPAQ) and published literatures comprised of four sections: (1) Section A: Demographic details such as age, gender, age, educational level; (2) Section B: Frequency of playing video games; (3) Section C: Frequency of physical activity involvement and; (4) Section D: Physical changes from playing video games. The inform consent form was enclosed in the first page of the questionnaire which contained the title, description, and purpose of the study to emphasize confidentiality of the respondents. The statements were written in English and Malay to ensure that respondents could understand the statements and

instructions, able to fill up the questionnaire at their comfort and most importantly give valid responses.

Data Collection and Analysis: The data collection was conducted from April until June 2020, during the lockdown period during the MCO. The survey was created using Google Forms and distributed online to the students using a direct shared link to the form. The survey distribution was carried out via social media platforms including Facebook, Telegram, Twitter, Whatsapp and Instagram. Respondents were asked to spend approximately ten to fifteen minutes to answer the questionnaire. All statistical analysis was conducted using IBM SPSS version 26.

Ethical Approval: Ethical approval was obtained prior to study commencement from the Universiti Teknologi MARA Research Ethics Committee (600-FF (PT.5/1)).

RESULTS: A total of 317 samples were collected with three samples excluded due to incomplete data. All participants who took part in the survey were undergraduate pharmacy students at the Faculty of Pharmacy, UniversitiTeknologi MARA. They were asked to voluntarily answer the online survey and submit the forms anonymously. The survey was conducted during the MCO condition whereby Malaysia citizens travel restriction and mandatory quarantine were enforced.

The mean age of participants included in the study was 19.4 years (SD ± 0.5) **Table 1.** Majority of the participants were Malay (89.2%) and female (55.4%). Overall, most of them played video games for about 1 to 2 days (40.8%) or 7 days (36.9%) per week. The gaming session typically lasted between 1 and 3 hours per day (71%) and only six participants (1.9%) played video games for more than 8 hours per day. The participants were asked if they had done any physical activities during one of those days. Half of them (53.9%) did not perform any vigorous physical activities at their home regularly in a week. One third of the participants (12.3%) admitted carrying out intense activities such as heavy lifting, intense indoor sports, jumping rope and heavy gardening which took about up to 60 minutes per session (92.4%).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE PHARMACY STUDENTS

	Frequency, n	Percentage, %	Mean	SD
Gender				
Male	140	44.6		
Female	174	55.4		
Age				
18 – 20	312	99.4	19.4	0.5
21 - 30	2	0.6		
Ethnicity				
Malay	280	89.2		
Chinese	0	0		
Indian	0	0		
Others	34	10.8		

Approximately a quarter of them did perform moderate physical activities for 1 to 3 days per week (39.4%). Some of these activities were light load lifting, fast dancing, general gardening, and simple aerobic exercise **Table 2**. Participants were also queried on the approximate duration of time spent sitting in a week. This includes being on the sitting position while performing other tasks than playing video games, for instance when using computer, reading, working, eating, watching television and others that utilize similar posture. It was found that although most of them spent sitting between 4 to 8 hours (42.3%) or more than 8 hours (36.9%) per week, not many observed any physical changes to their body or experienced back pain after playing video games.

TABLE 2: FREQUENCY OF VIDEO GAMING, PHYSICAL ACTIVITIES AND PHYSICAL CHANGES OF PHARMACY STUDENTS DURING COVID-19 RESTRICTION

		Frequency, n	Percentage, %	Mean	SD
Video gaming					
How many days did you play video games in the last 7 days	1 – 2 days	128	40.8	4.0	2.62
	3 – 4 days	40	12.7		

	5 – 6 days	30	9.6		
	7 days	116	36.9		
How many hours did you play video games in one of those days	1 – 3 hours	223	71.0	3.05	1.77
	4 – 5 hours	61	19.4		
	6 – 7 hours	24	7.6		
	8 hours or more	6	1.9		
Vigorous physical activities					
During the last 7 days, how frequent did you do vigorous physical activities	None	169	53.9	1.41	1.93
	1 – 3 days	97	31		
	4 – 6 days	39	12.3		
	7 days	9	2.9		
How long did you spend your time on doing vigorous physical activities on one of those days	Up 60 minutes	134	92.4	49.45	17.45
	61 – 120 minutes	8	5.4		
	More than 120 minutes	3	2.1		
Moderate physical activities					
During the last 7 days, how frequent did you do moderate physical activities	None	122	38.7	2.08	2.24
	1 – 3 days	124	39.4		
	4 – 6 days	46	14.8		
	7 days	22	7.1		
How long did you spend your time on doing moderate physical activities on one of those days	Up – 60 minutes	180	93.5	54.45	14.51
	61 – 120 minutes	9	4.6		
	More than 120 minutes	3	1.8		
Physical changes					
How long did you spend on sitting during the last 7 days	Up to 3 hours	65	20.8	6.14	2.07
	4 to 8 hours	133	42.3		
	More than 8 hours	116	36.9		
Do you notice any physical changes to yourself after playing video games	Yes	95	30.6		
	No	137	43.6		
	Not sure	81	25.8		
Have you experienced back pain after playing video games	Yes	125	40.1		
	No	161	51.3		
	Not sure	27	8.6		

DISCUSSION: In the absence of direct meeting with friends and live entertainment is mostly non-existent, it came as no surprise that people are likely to utilize social media as means to communicate, socialize and play around to counter the physical distancing effect. With individuals sheltering at home due to the COVID-19 pandemic, many had opted for video games as the easiest way to pass the time. Although video gaming is a behavioural addiction classed under the DSM-5 and even associated with a range of negative impact such as aggressiveness, and antisocial behaviour, growing evidence relating to their beneficial effects suggested the opposite [19, 20]. This cross-sectional study aimed to evaluate the frequency of playing video games with physical activity level among the pharmacy students. Based on our results, the students commonly played video games mostly between 1 to 3 days in a week, and some even played them on a daily basis. The time spent playing varied among the participants with most of them stating to spend up to 3 hours during each playing session while the rest played for even longer than that. The consensus of gaming addiction does not include a specific duration of hours playing, thus raising questions regarding certain features of such disorder. A study by Puerta-Cortés et al. found that different types of passion and impulsivity towards gaming are associated with various level of invested hours and playing intensity especially for the massive multiplayer online role-playing game [21]. Triberti *et al.* described that the playing time of the day is correlated with the player's age whereby younger participants preferred to play more in the afternoon compared to older participants [22].

Video gaming may have been advantageous in terms of improving common skills or graduate attributes among undergraduate students, as reported in a randomized controlled trial by Barr in 2017 [23]. It was shown that playing commercial video games helped in delivering positive impact on their communication ability, adaptability and resourcefulness. Such skills are particularly crucial for pharmacy students in the wake of relatively higher unemployment rate among the pharmacy graduates in recent years [24, 25]. In a different controlled trial involving college students, it was revealed that even after 2 months of violent video gameplay, there were no specific changes in aggression among the participants involved [26].

As video gaming has also been frequently associated with sedentary behaviour, our findings showed that about half and a quarter of the participants did not perform any vigorous or moderate physical activities, respectively. Vigorous activity requires more energy expenditure that often leads to an increase in the expiratory activity of the person while moderate activity requires lesser than its counterparts. In our case, the students generally spent up to 60 minutes of working out in each session to perform either moderate or physical activities. This is in parallel with the recommendation by WHO that an adolescent should spend at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity every week to reduce the atherosclerotic cardiovascular disease (ASCVD) risk (WHO 2019).

Although our findings revealed that most of them did not experience any pain or notice physical changes despite spending time more than 4 hours sitting per week, many of them still lacked the proper amount of physical exercise despite. Sitting is a part of sedentary behaviour as it lacks the expenditure of energy. Prolonged sitting has been demonstrated to be closely connected with physical inactivity which can produce deleterious effects similar to that of smoking [27] and obesity [28, 29]. Recent studies have demonstrated that these effects could possibly be reversed with the application of exergaming which comprised many different modalities including walking, dancing, boxing, running, running and others. The home-based Wii Fit U exercises were shown to be associated with better pain self-efficacy among the elderly participants who were formerly diagnosed with chronic low back pain [30]. Improved cardiovascular conditioning and flexibility were observed among the sedentary female university students and stroke patients after engaging in aerobic dance exercise programme using the XBOX Kinect [31, 32]. This is supported by other studies demonstrating that physical activities in exergaming had been shown to be associated with reductions in body fats [33] and could be used to fight against obesity [34, 35]. Our study, however, did not provide details on the different types of video games used by the students which warrants further investigation in future. Our findings were also limited by the fact that the participant's fitness level was not determined and small sample size, hence the result should not be generalized to the whole population.

CONCLUSION: Despite the limitations of this study, our results indicated that many pharmacy students were still lacking proper amount of physical activity which is aggravated by the lockdown order due to the unprecedented COVID-19 pandemic. The unanticipated quarantine may have collateral consequences on the student's lifestyle that require changes in daily routine to sustain adequate health condition and therefore should be adjusted accordingly post-pandemic.

ACKNOWLEDGEMENTS: None

CONFLICT OF INTEREST: None

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How to cite this article:
Suhaimi AM, Baharudin SKAS, Wahab MSA, Samah NHA, Ariffin SA, Elkami RM and Mohammed AH: Covid-19 and physical activity levels among pharmacy students: the impact of video gaming. Int J Pharm Sci & Res 2024; 15(1): 202-08. doi: 10.13040/IJPSR.0975-8232.15(1).202-08.