

ORIGINAL SCIENTIFIC PAPER

Perceived Barriers to Physical Activity of College Students in Manila, Philippines during the COVID-19 Community Quarantine: An Online Survey

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Abstract

This study aimed to identify the physical activity barriers affecting college students and analyse how they differ between types of schools (private colleges-universities and government-state universities), and to improve schools' online distance learning physical education programmes in the Philippines. One hundred fifty (N=150) officially enrolled students participated in the study, from private and state universities, composed of athletes, non-athletes, and inactive athletes. With the use of the Barriers to Being Active Quiz, comprising seven (7) barriers (Lack of Time (LT), Social Influence (SI), Lack of Energy (LE), Lack of Willpower (LW), Fear of Injury (FI), Lack of Skill (LS) and Lack of Resources (LR)), responses were collected adapted through online administration. After the response collection, results show high mean scores in LR and significantly low scores in FI and LS barriers among private and state university students. Private and State University students differ from each other significantly ($p < 0.05$) in the barriers SI, LW and LR, with state university students exhibiting greater mean scores. Active athletes possessed significantly lower scores during quarantine in most barriers (LT, SI, LE, LW, LS and LR), while inactive athletes exhibited the highest in FI. Further studies and examination of online physical education programmes are recommended to help students counter the reduced physical activity during quarantine, aside from strengthening government encouragement to those without access to exercise opportunities.

Keywords: *physical activity, COVID-19, quarantine, barriers*

Introduction

The Philippines was not spared the spread of the Severe Acute Respiratory Syndrome - Corona Virus - 2 (SARS-CoV-2), commonly known as CoViD-19. Its spread was caused initially by individuals from countries with existing infections and then further spread locally through direct contact with these individuals. The spread from person to person may be attributed to transmission of the virus via direct physical contact, droplets, and fomites. When infected individuals talk, sneeze, or cough, they produce droplets containing the SARS-CoV-2 virus. This is then inhaled by

other individuals. On the 12th of March 2020, the Philippine government-imposed travel restrictions in Metro Manila to limit the spread of the SARS-CoV-2 virus. This measure was further expanded to cover the whole of Luzon on the 16th of March under the term "Enhanced Community Quarantine" (ECQ). ECQ was enforced in some areas of Luzon, including Metro Manila, until the 15th of May. To facilitate the gradual return to work and to manage mobility concerns, the Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF) created quarantine classifications and grouped certain industries under specific



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categories. These quarantine classifications are, beginning with the most restrictive, the Enhanced Community Quarantine (ECQ), Modified Enhanced Community Quarantine (MECQ), General Community Quarantine (GCQ), and Modified General Community Quarantine (MGCQ).

With the implementation of the quarantine classifications, the ability of individuals to participate in physical activity and exercise was affected. Individuals were not allowed to exercise outdoors under ECQ. Under MECQ, limited outdoor activities are allowed provided that the individuals wear masks and observe a two-metre distance between people. Such activities included walking, running, bicycling. Restrictions are then eased for GCQ, allowing non- or limited-contact sports, such as golf and tennis. Contact sports, such as boxing, wrestling, and basketball, remained prohibited under GCQ. Only in MGCQ would sports such as basketball and football be allowed. This situation is further exacerbated by the fact that gyms, fitness studios, and sport facilities will also remain closed in ECQ, MECQ, and GCQ areas as they fall under category 4 of the IATF Omnibus Guidelines on the Implementation of Community Quarantine in the Philippines.

In the absence of such facilities and the limitations of activities one can participate in, individuals were left to what was immediately available to them in their household. This included available equipment, if any, as well as available space that may be allocated or used for exercise. Other considerations that influenced an individual's continued participation to exercise included existing household responsibilities or ones that have emerged because of the quarantine imposed by the government. Emotional considerations resulting from the CoVid pandemic may have also influenced their attitude towards physical activity and exercise.

CoVid-19, Comorbidities, and Physical Activity

Participation in regular physical activity (PA) improves well-being due to physiological adaptation. Previous articles' (Zbinden-Foncea, Francaux, Deldicque, & Hawley, 2020) preliminary data indicated that the eventual outcome of being infected and the severity of symptoms associated with CoVid-19 are related to the health status of the individual. In another study (Pitones-Rubio et al., 2020), shared risk factors including diabetes, hypertension, asthma, and obesity were identified between Periodontal Disease and Covid-19, as well as in the systematic review by Zaki, Alashwal, and Ibrahim (2020). Frolidi and Dorigo (2020) found that more than 68.3% of patients in Italy had hypertension, 28.2% had ischemic heart disease, and 30.1% had type-2 diabetes. In the same Italian study, they determined that men show worse outcomes compared to women, hypothesising hormones and lifestyle, as well as endothelial health and control of vascular inflammation, as having driving roles in the severity of CoVid-19.

All studies mentioned are consistent as a meta-analysis was done in which the presence of comorbidities, such as hypertension, diabetes mellitus, cardiovascular disease, COPD and chronic kidney disease, had significant relations with patients with serious CoVid-19 outcomes (Nandy et al., 2020). Among these mentioned, diabetes mellitus significantly impacts the mortality of patients from the disease.

Concerns regarding endothelial function are extensively considered when dealing with lifestyle diseases like the men-

tioned comorbidities, and exercise likewise impacts health (Bi et al., 2020). Relatedly, this can explain reductions in blood pressure with exercise as it improves the endothelial function of prehypertensive and hypertensive individuals (Pedralli et al., 2020). Also, it is theorized that severe inflammation in the endothelial cells is associated with disease severity and mortality, putting melatonin in the picture as a powerful antioxidant for infected individuals with obesity and diabetes (M.A. El-Missiry, Z.M.A., El-Missiry, & Othman, 2020).

Other positive outcomes of PA have also been associated with CoVid-19. In a study by Damiot, Pinto, Turner, and Gualano (2020), PA impacts immune function by regulating pro-inflammatory and anti-inflammatory cytokines. In another study (Costa et al., 2020), metabolic disorders, which are influenced by PA, greatly affects the development of the disease and is also associated with "worse outcomes". Theories have also surfaced that despite being vaccinated, obese adults were found to be twice as likely to develop influenza illnesses compared to healthy adults (Neidich et al., 2017). This finding is consistent with those of Campbell and Turner (2018) from a human vaccination study in which bacterial and viral antigen responses are heightened following bouts of exercise. These reviews not only strengthen how comorbidity risk and disease severity are connected but also raise the connection of immunization effectiveness with physical activity.

Physical Activity During Quarantine

Participation in PA has been greatly affected by the CoVid-19 pandemic due to quarantine regulations. A study by Constandt et al. (2020) showed self-reports of reduced exercise during a lockdown. Older adults with low education, social influences, and not depending on online tools are highly affected. Stay-at-home orders also affected other forms of physical activity engagement reduction, such as sports participation (Schnitzer, Schöttel, Kopp, & Barth, 2020). It is also seen that post-lockdown increased the participation of less active groups. This observed reduction suggests alleviating the global cardiovascular disease problem (Pecanha, Goessler, Roschel, & Gualano, 2020; Lippi, Henry, & Sanchis-Gomar, 2020), implying that governments and policymakers should consider how can exercise be encouraged during lockdowns and quarantines (Constandt et al., 2020).

With the reduced amount of physical activity, it is expected that total energy expenditure would be affected and found to decrease significantly (Giustino et al., 2020); in the same study, it was found that both sexes were affected by this decrease when measures before and during the quarantine were compared. The ripple effect of this observation may relate to the findings that BMI and weight gains were detected in both male and females (M. He, Xian, Lv, J. He, & Ren, 2020). Along with this are other possible circadian biology disturbances, such as daily patterns, the timing of meals and sleep (King, Burke, Halson, & Hawley, 2020), and imbalances resulting from home-based isolation. Furthermore, health negative effects were not limited to the physical aspect but were also found to negatively impact psychological well-being (Lim, Fong, Hariram, Lee, & Tor, 2020; Thakur, Kumar, & Sharma, 2020). Maintaining physical activity at home is found to be an excellent strategy in addressing physical (Tornese et al., 2020) and mental health issues (Maugeri et al., 2020) during a quarantine. This increase in physi-

cal activity engagement is strongly recommended (Matias, Dominski, & Marks, 2020) to enable reset and recreation of wellbeing while remaining safe at home.

With the recommendations based on evidence, physical activity promotion is as important as how policies on social distancing and physical contacts were disseminated, and the need to explore the nature of engagement decrease is readily apparent. This research aimed to determine what physical activity barriers for college students in Manila look like during community quarantine and to analyse how these barriers differ between types of schools: private colleges-universities and government-state universities. The findings of this research are intended to benefit the development of college physical activity programmes to address the needs of students in quarantine and strengthen schools' distance learning physical education programme, specifically in the Philippines.

Methods

Respondents

The study participants were one hundred fifty (N=150) officially enrolled university college students in Manila during the CoViD-19 quarantine who were undergoing online distance learning from two university types. Ninety (90) of them were from private universities and 60 from a state university with mean±sd age of 19.87±1.30 years. Among the participants were 62 males, 85 females, and three preferred not to say gender. There were 62 athletes and 88 non-athletes. Only those who provided consent response were included in the study.

Barriers to Being Active Quiz

Researchers utilized an online questionnaire adapted from the Barriers to Physical Activity Quiz developed by the U.S. Centers for Disease Control and Prevention, also used in previous physical activity research studies (Call et al., 2020; Mariam & Mazin, 2019; Rosselli et al., 2020). It is composed of 21 statements that encompass seven barriers to being active: Lack of Time (LT), Social Influence (SI), Lack of Energy (LE), Lack of Willpower (LW), Fear of Injury (FI), Lack of Skill (LS), and Lack of Resources (LR). The contents of the questionnaire were administered online using Google Forms.

The multiple submissions setting was disabled, using the respondents' e-mail addresses, to minimize the impact of errors.

Study Procedures

The questionnaire was administered through communication platforms used by participants for their online classes, disseminated through a Google Forms link. Questionnaires were answered using respondents' devices at their homes. The responses were collated, documented, and appraised according to the tool's scoring system.

Ethical Considerations and Informed Consent

Participants were oriented orally and in writing using a written consent as a gateway to the questionnaire link. Details of the informed consent include the following. First, the purpose of the study and the reason for being asked to participate were discussed; the scope of duties and amount of time needed in their participation were featured; finally, risks and benefits were declared, and its voluntary nature was emphasized. Contact information of the corresponding researcher was given to all participants for concerns with regards to their rights and/or withdrawal of participation. All was done in conformity with the Declaration of Helsinki.

Statistical analysis

Mann-Whitney U, the analogue counterpart of the T-test, was used in the analysis of means along with figures and tables presented.

Results

Private vs Government Universities

Figure 1 shows that LR for both university types had the highest mean response scores with 4.36 from private and 5.67 from public universities. Among the lowest barriers were LS and FI, with 2.18 and 2.17 for private universities and 2.62 and 2.37 for state universities. State university respondents scored significantly higher ($p < 0.05$) in SI, LW and LR in comparison to their private university counterparts, with z-scores of -3.44, -2.56, and -3.10, respectively. The state university group still showed higher mean scores in other barriers (LT, LE, FI and LS).

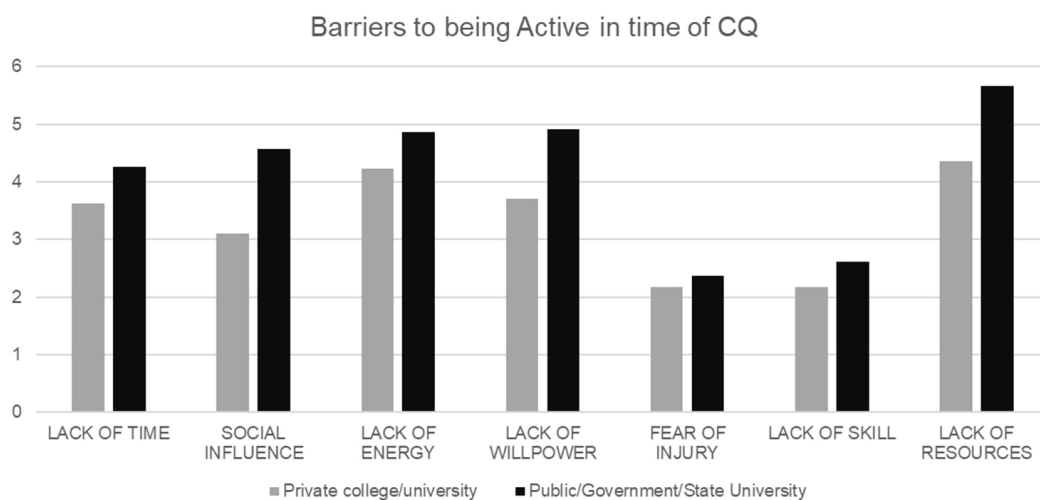


FIGURE 1. Comparing mean barrier scores of college students from private and government universities

Within the barriers of private university students, mean FI and LS showed significantly low scores compared to others (SI,

LE, LW & LR). LR and LE were significantly higher compared to most barriers, as shown in Table 1.

Table 1. Inter-barrier analysis using z-scores from Mann-Whitney U of private university students

Inter-barrier Analysis- Private Colleges and University (z-score)						
	SI	LE	LW	FI	LS	LR
LT	1.23593	-1.54205	-0.21314	-3.67345*	3.7793*	-1.89537
SI	x	-2.71503*	-1.38326	2.38602*	-2.59058*	-3.19853*
LE	x	x	1.21876	5.0653*	5.01809*	-0.27179
LW	x	x	x	3.60335*	3.54184*	-1.5163
FI	x	x	x	x	0.42628	-5.64893*
LS	x	x	x	x	x	-5.55881*
LR	x	x	x	x	x	x

Legend: * - p≤.05

Table 2 presents that respondents' low mean scores from the state university group in FI and LS are evident and significantly different (p<0.05) from the other four barriers. Additionally, LR shows a recognizable difference (p<0.05) with four

others: LT, SI, FI and LS.

Gender, Athletic Involvement and Residence

Respondents who prefer not to say their gender (N=3) re-

Table 2. Inter-barrier analysis using z-scores from Mann-Whitney U of state university students

Inter-barrier Analysis- Public/State University (z-score)						
	SI	LE	LW	FI	LS	LR
LT	-0.70069	-1.57197	-1.62708	4.70803*	-4.05195*	-3.31189*
SI	x	-0.87652	-0.8844	5.2119*	-4.43248*	2.6112*
LE	x	x	0.01312	5.75251*	4.86286*	-1.78454
LW	x	x	x	5.92571*	5.04657*	-1.7478
FI	x	x	x	x	0.01575	-7.03318*
LS	x	x	x	x	x	-6.11729*
LR	x	x	x	x	x	x

ported greater mean scores in all barriers. Figure 2 shows that between males and females, male college students outscored females in terms of barriers with a mean LR score of 5.37. Male

and female mean scores show close values in LS, with only a 0.06 difference. Mean score differences between LT and LR were the greatest among the barriers of males and females.

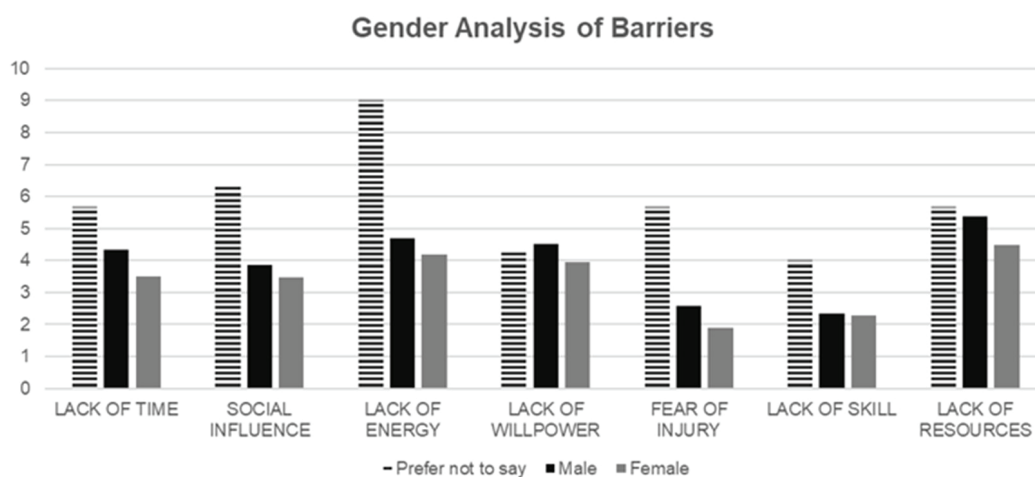


FIGURE 2. Comparing means scores across genders

Figure 3 shows that mean scores of active athletes were significantly lower than the scores of inactive and non-athlete groups in the LT, SI, LE, LW, LS and LR with z-scores of -3.01114, -1.96882, -2.75279, -3.04678, -2.03119 and -3.02005, respectively (p<0.05). In the FI barrier, only active athletes and inactive athletes show significant differences in mean scores. While no significance was found, a notable difference is perceiv-

able between FI mean scores of inactive and non-athlete groups.

Comparing means in terms of the type of residence, the informal-settlement group scored highest in LR, LS and LW. Table 3 shows that they possessed the highest barrier score of 5.92 in LR but low in FI with 1.9166. Respondents from the condominium group scored the lowest barrier of 1.66 in LS while keeping relatively high scores in LR and LE.

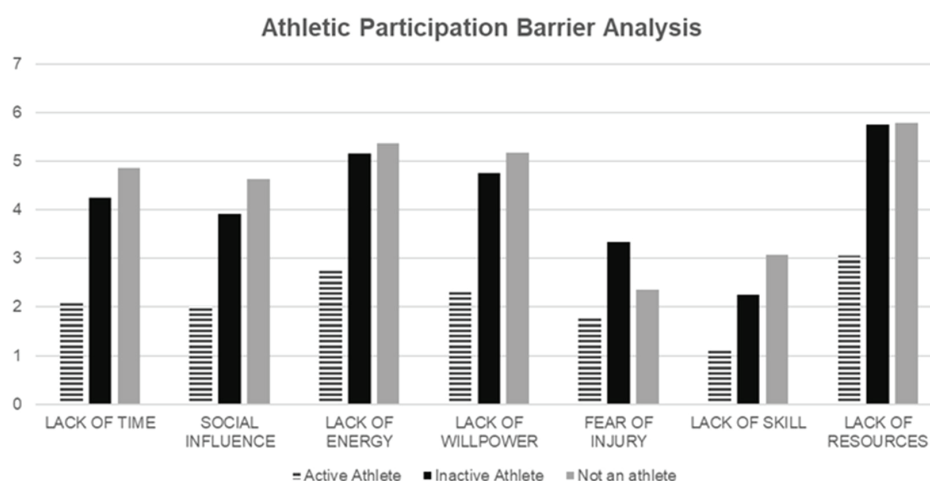


FIGURE 3. Comparing mean scores according to nature of athletic participation

Table 3. Mean scores of each barrier based on type of residence

	LT	SI	LE	LW	FI	LS	LR
Single-detached (in a subdivision)	4.09589	4.013699	4.684932	4.109589	2.219178	2.369863	4.780822
Townhouse	3.5	3.666667	4.208333	3.916667	2.125	2.375	4.625
Condominium	4.5	3.166667	5.166667	4.5	2.416667	1.666667	5.416667
Dormitory	3.4	3.4	3.6	3.9	3.1	2.8	4.1
Informal-settlement Areas	3	3.5	4	4.833333	1.916667	2.583333	5.916667

Discussion

With the encouragement of exercise and physical activity during quarantine and lockdown, as previously reported (Constandt et al., 2020), a review of physical activity designs in schools doing distance education is suggested, and the problem of reduced exercise in students should be addressed. Benefiting mostly the school-age population, the strengthening of physical education models to tackle this concern can be done. Gathering data from a distance may be adopted as done in previous works (Giustino et al., 2020) involving online questionnaires, physical activity, and energy expenditure.

Type of University

The discrepancy of respondents from private and from state university suggests the premise of the difference in internet access of respondents from two university types. The online questionnaire administration poses as a limiting factor to respondents who are challenged by lack of internet access. The difference between the two universities typed in willpower, social influence and resources scores is theorized to be primarily the influence of the difference in economic status. With the additional economic challenges of the pandemic, students and possible influencers focus on their essential needs, such as food. Virtual influencers such as friends from a distance also experience the impact of this focus for the essential.

In terms of inter-barrier differences, fear of injury and lack of skill among respondents from both university types is recognizably lower than other barriers. Students in the private university are hypothesized to engage in exercise for health purposes, outweighing the quality of movement participation, and the risk of injury is seen to be less important. In contrast, respondents from the state university group are posited to participate more for fun and maintaining mental

health over the risk of movement execution.

Gender, Athletic Involvement and Residence

The results of previous studies determined between genders and specifically in susceptibility to SARS-CoV-2 appear to be unclear (Froldi & Dorigo, 2020). However, the same study theorized that the “styles of life” play a role and is reflected with the theories of this study. In the Philippines, societal expectations differ between men and women. The fact that Filipinos are likely to be more active physically influences how they perceive these barriers. The same is valid for women: they are still expected to stay domestic and less adventurous physically, even at present.

The athletic involvement of respondents also varies and affects how they cope in maintaining physical activity during quarantine. Active athletes, or those who are currently preparing for possible competitions, can handle the barriers, with the factor of knowing different training methods even at home. Furthermore, active athlete respondents were identified as being locked down inside university dormitories where sports facilities are accessible. While non-athletes are understandably hindered by skill, inactive athletes are prevented because of fear of injury, a known stressor due to return-to-play concerns, as found by Sutcliffe and Greenberger (2020).

Lastly, the type of residence is theorized to affect access to space and dedicated facilities where the opportunity to become physically active is found. This is seen in the high resources barrier among respondents residing in condominiums, where living spaces range from 20 to 30 square metres and where amenities and sports facilities are temporarily closed to the public. This factor is in addition to the possible fear for congregating, unlike those in informal settlements who seemingly possess no fear from life threats or even injuries from physical activities.

Conclusion

In conclusion, the researchers found the highest mean scores in lack of resources as a barrier to physical activity participation for both private and state university groups. The high mean score in Lack of Time for private university respondents is comparable to their Resources barrier score. There are also significantly low scores in Fear of Injury and Lack of Skill barriers for both types of universities. Private and state university respondents significantly differ in Social Influence, Lack of Willpower and Lack of Resources barriers, with the state university group showing greater values. The results

Acknowledgements

There are no acknowledgements.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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support the recommendation of Constandt et al. (2020) that the government holds a great impact in maintaining physical activity levels of the population during quarantine by providing encouragement programmes, especially to those who have difficulty accessing other means of doing so. The study also recommends designing higher education physical education programmes according to how private and state university students perceive the instances that prevent them from becoming more active physically. Further studies are recommended due to the limitations of online surveys and additional control to varying factors that might influence sample responses.

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