

Comparing Sitting Time Between Male And Female Undergraduate Students During Weekdays And Weekends

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Abstract: *The purpose of this study was to evaluate the total daily sitting time for male and female undergraduate students and to compare their daily sitting time between weekdays and weekends. A sample of 375 participants responded to the Sedentary Behaviour Questionnaires (SBQ) survey. T-test was used to analyse the differences in sitting time between genders, while multivariate analysis of variance (MANOVA) was performed to investigate the gender differences in the sitting time between weekdays and weekends. The results showed that female undergraduate have a longer daily sitting time (M=9.64 hours/day, SD=30.302) as compared to the male undergraduate (M=9.46 hours/day, SD=31.296). However, there was no significant difference reported between sitting time for both genders ($t=1.379$, $p=0.169$, $p>0.05$). Higher total sitting time on weekdays and weekends were also reported by female undergraduate students as compared the male undergraduate students. Similarly, no significant findings were also reported between genders during weekdays and weekends. The reported F-value was $F(2,375)=1.7$, $P=0.05$: Wilks' Lambda=.99; partial eta squared=0.007. Prolong durations of daily sitting time (more than 6 hours daily) is associated with higher rate of chronic diseases and premature death especially among working adults. Hence, undergraduates who are future workforce replacements need to be encouraged to be active and not sit too long during their study years. Good habits such as completing their tasks while standing and to break the prolonged sitting patterns with slight movements should be inculcated in their daily routines. This can help them to reduce the risk of being sedentary by sitting too much and too long in a day.*

Keywords: *Sitting Time, Undergraduate Students, Weekday, Weekend, Physical Activity*

1. INTRODUCTION

Decreasing sedentary behaviour to a minimum while maintaining to be physically active is beneficial and necessary to maintain good health. An incidence of heart attack was halved in London bus conductors who climbed the stairs of double decker buses as part of their daily task as compared with drivers who spent most of the day sitting in earliest 1953 years (Andrade & Ignaszewki 2007). This study was one of the first scientific publication related to physical activity leads to the decrease risk of the heart attack and it comes out with a scepticism that activity or exercise that could be more protective against death from cardiovascular disease. Since that time, year by year many studies have been conducted and

been confirmed that physical activity helps in preventing cardiovascular, metabolic, musculoskeletal and even mental health illness (Bauman 2003; Chau et al. 2013).

Today, the increase of studies show health risk associated with an overly sedentary lifestyle whether it was for prolonged, uninterrupted periods or for a significant portion of daily time (Gibson, Muggeridge, Hughes, Kelly, & Kirk, 2017; Panahi & Tremblay 2018). This has led to a serious implication for individual across the world and Malaysia was no exception including university students. University students are spending more time in classes, doing some paperwork, and playing video games were part of longer sitting time. According to Deliens, Deforche, Dyck et al. (2015) stated total sitting time among university students is increasing. This can expose them to higher risk for various chronic health conditions in future.

Prolonged sitting of times has been called as the “New smoking” due to the increasing of the health problem (Gardiner, Lynch, Victoria & Johnson, 2018). A previous study of Internal Medicine in 2015 state that “*Prolonged sedentary time was reported to individualistically associate with deleterious health outcomes regardless of the physical activity*” (Biswas et al., 2015). This health condition was associated with cardiovascular disease (CVD), obesity, and type II diabetes. The study by Wilmot et al. (2012) has documenting 18 studies that determined on diseases on the higher levels of sedentary behaviours. Moreover, the increases in death due to the increasing in sedentary behaviour. The more individual sitting, the higher risk of premature death (Bennie et al. 2015).

We know and apprehend about sitting all day long (more than 6 hours daily) has negative impact on quality life related to our health and combined with less time of physical activity (Dogra et al., 2017; Stamatakis et al., 2019). This also supported by Marshall and Ramirez (2011) stated that sitting longer than six hours or more a day could cause 19% more likely to die over the next two decades than those who spent less time of sitting. The lack of physical activity is the fourth leading cause of the deaths in the world (Nowak, Bozek & Blukacz (2019). A study related to comparing sitting time between male and female has long been conducted by many researchers and mostly are done among workers which reported to have the highest percentage in daily sitting time. Johansson, Mathiassen, Rasmussen and Hallman (2020) stated men and women with same occupation may perform different work tasks, which will result in different pattern of sitting time and physical activities at work. This study found men spend on average 72% and women 67% of their worktime sitting. About 50% of the men, and 34% of the women in the present population spent more than 75% of their time at work sitting, predominantly in uninterrupted bouts longer than 30 min, which is also consistent with findings by Hadgraft, Healy et al. (2016).

The universities students are also spending a lots of time sitting during weekdays especially when attending lectures. This has been highlighted by Buckworth and Nigg (2004) who have stated that there is a lacked of research related to comparing sitting time among university students being conducted. Their sitting profile during the days of the week might be different as the results of these activities.

Deliens, Deforche, Bourdeaudhuij, and Clarys (2015); Løyen et al. (2016) reported that sitting time among university students is increasing. Based on Clemente, Nikolaidis, and Manuel (2016); Fagaras, Radu, and Vanvu (2015); Khera (2012), reported that students becoming more inactive as their level of physical activity are decreasing while their body mass index and weight shown to increase. This was because due to the fact that most of the students nowadays prefer to use transportation such as car or buses in order to travel from one place to another within the campus rather than spending time walking. When comparing sitting time between genders, Rajappan, Selvaganapathy, and Liew, (2015) stated women (42.6%) tend to spend more time for sitting compare to men (36.7%). However, Wallmann-Sperlich, Bucksch, Hansen, Schantz, and Froboese (2013) reported the opposite result, where

the amount of sitting time in men are found to be higher compared to women as men tend to spend more than two hours every day on their small screen recreation. Meanwhile in the study by Alkahtani (2016); Prince, LeBlanc, Colley, and Saunders (2017) found that there is no difference between male and female on their sitting time. This inconsistency results in the findings of sitting time between genders require more studies to be carried out in the future in order to get clearer explanations.

Recent studies that conducted among students reported that they have shown to spend most of their free time engaging in sedentary activities such as watching TV (24%), playing console games (7%), using the computer (9%), and surfing the internet (17%) for more than two hours daily on weekdays (Martínez Gómez et al. 2012). While on weekend it was slightly increased to 50%, 16%, 22% and 35% respectively, which concluded that sitting time was longer on the weekends as compared to the weekdays. Opposite finding was reported by Gibson, Muggeridge, Hughes, Kelly, and Kirk (2017) who also found that the participants spending longer sitting time on weekdays (10.7 hours) than in weekend (8.6 hours). However, the participants' profiles based on genders and activities during the week was not included. Hence, study on comparing sitting time between male and female undergraduate students during weekends needs to be conducted.

2. METHODOLOGY

This is a cross-sectional study aimed to compare sitting time between male and female among the undergraduate. Universiti Putra Malaysia was randomly selected as the representative and all the undergraduate students were invited to participate in this study. Based on the sample size calculation, a total of 375 undergraduate's students were required for this study. In order to make sure all the faculties have equal representatives cluster sampling technique was applied to select the samples. It started with random sample of clusters by faculties. The range of age among the participants was between 20 to 28 years old.

Sedentary Behaviour Questionnaire (SBQ) was used to measure total sitting time among undergraduate students. It consists of 9 questions that the level of sedentary behaviour for weekdays while 9 questions was for weekend within the same questions. This questionnaire used to see how much the amount of time does the participants spends for weekdays and weekend which ranging from none, 15 minutes or more, 30 minutes, 1 hours, 2 hours, 3 hours, 4 hours, 5 hours, 6 hours or more. The reliability of the questionnaire for weekdays in range .64-.90 and for weekend is range .51-.93 (Rosenberg, Norma et al., 2010) and .77-.92 weekdays and .72-.90 weekend (Prince 2017). Independent Sample T-Test and MANOVA were used in this study. The significant level was set at $p > 0.05$. Pilot study has been conducted before the actual data collected. The pilot study was involving 38 undergraduate students. From the results have shown the questionnaire. It can be used by populations since the reliability was $\alpha = 0.71$ for weekdays and $\alpha = 0.72$ for weekend was classified as acceptable reliability (Pallant 2010). Therefore, there was no modification was made to the questionnaire from the pilot study due to high reliability that was obtained.

3. FINDINGS

Comparing the Sitting Time between Genders

Table 1 showed the female participants' mean was slightly higher than male participants with female participants acquired a mean of *9.46 hours/week* while male participants' acquired a mean of *9.64 hours/week*. However, Independent Sample T-Test showed that there was no significant difference in sitting time (hours/week) between male and female participants with $p > 0.05$ ($p = 0.169$) and $t = 1.379$. Hence, there was no significant difference in sitting time between male and female among undergraduate students based on genders.

Table 1: Total Sitting Time between Genders (hours/week)

Gender	N	M (hours/week)	SD	t	P
Male	187	226.98 (9.46)	31.296	1.379	.169
Female	188	231.37(9.64)	30.302		

The gender was considered as one of the most important predictors of sitting time. A number of studies showed that sitting time level varied by genders in which female participants demonstrated higher percentage in sitting time than male participants (Rajappan, Selvaganapathy & Liew, 2015). However, the finding in the study showed there was no significant difference between genders in terms of sitting time of male and female undergraduate students. Although comparison results between genders indicated that there was no significant difference, the results of total sitting time by female (9.64 hours/week) students was still higher than male (9.45 hours/week) students were exceeding the recommended less than 6 hours sitting time per day suggestion. According to study by Salamuddin and Harun (2010), male students were found to be more physically active than female students. This is in line with study finding by Chan et al. (2019) also reported the females were higher in sitting time than males due to the different type of activities they were involved in and the personalities attributes toward exercising and being active. The various psychological factors such as self-discipline, value, perceived enjoyment, norms and beliefs and management of time were found to influence the student's sitting time and also physical activity (Puig-ribera et al., 2015). "Having fun" was one of the reasons university students participated enrolled in elective physical activity courses (Bennie et al., 2015). This factors will have an impact on the amount of time spend sitting by the undergraduates.

The explanation for this phenomenon was female students tend to take part in light and moderate intensity activity. Female were also reported to have less time, lethargy, no companion to carry out physical activity and they have a shy attribute that became barriers for them to participate in the physical activity (Proper et al. 2011). This finding was consistent with study by Abedalhafiz, Altahyneh, and Al-Haliq (2012) which mentioned that female experiences more hindrance to participated in physical activity compared to males. A previous study by Bey and Hamilton (2003) reported that lack of time was the most common excuse given by students for not be able to participated in physical activity. In regards to female students, they prefer to use their time to carry out other activities rather than participating in physical activities which identification of socio-demographic factors concerning physical inactivity (Castro, Bennie, Vergeer Bosselut, & Biddle 2018). Thus, it was recommended that physical activity programs are developed for females (Rajappan, Selvaganapathy, & Liew 2015). Gender and age are some main factors relating to physical activities, however this study did not show any significant difference in term of sitting time between the gender. This information provide insight to indicate that male undergraduate although reported to be more physically active than female, however the male undergraduates are also sitting longer than 6 hours per day. Both male and female students spent most of their sitting time studying. For example, activities such as sitting in class, sitting while playing computer or sitting while doing paperwork would cause difficulty for the students to be physically active (Bennie et al., 2015). Hence, suggesting them to take a short break in between class activities is important to reduce the prolong hour of sitting time among undergraduate. Based on finding by Hamilton, Geneview, et al. (2008) has reported taking a five minutes' walk for every hour was beneficial for weight control or lose weight. Therefore, university policy makers should arrange class schedules that would enable the students to move around during the break time by bike or by foot between the student's classes.

Comparing the Sitting Time between Gender on Weekdays and Weekends among Undergraduate

A way multivariate analysis of variance between groups was performed to investigate the differences in sitting time between genders. Two dependent variables were incorporated in the research; weekdays activity and weekends activity. As for an independent variable, gender was used. The results showed that there was no significant difference between male and female on the combined dependent variables, $F(2,375)=1.7$, $P=0.05$: *Wilks' Lambda*=.99; *partial eta squared*=0.009. In addition, when the result for the dependent variables was considered separately, both the dependent variables were also did not reach the statistical significance. Overall, both genders were reported to be more active during weekdays as compared to weekends.

Table 2: Total Sitting Time for Gender on Weekdays and weekend

Activities	Male		Female	
	Weekday	Weekend	Weekday	Weekend
Watching television/video	4.05	4.16	4.79	4.75
Playing computer/video games	4.85	4.39	3.74	3.99
Sitting while listening to music	3.26	4.32	3.65	4.40
Sitting and talking on the phone	2.71	3.16	3.13	3.18
Writing paperwork/computer work	3.47	4.34	3.77	4.44
Sitting while reading a book/magazine	2.78	3.38	3.05	3.44
Playing musical instrument	2.13	3.14	1.98	3.16
Doing artwork/crafts	1.81	3.17	2.03	3.08
Siting and driving in a car, bus/train	4.13	3.68	4.21	3.69
Total hours/day	7.02	6.43	7.11	6.70

Opposed to the expectations, there was no significant difference in sitting time between both male and female on weekdays and weekends thus suggesting that they might have similar routines. Table 2 describes that the differences in sitting time on weekdays and weekends for female and male separately. The differences in mean in terms of activities were observed between male and female on weekdays and weekends. The results showed that male and female have almost similar routines spending on weekdays and weekends. On weekdays, male students spent more time on playing computer or video games (4.85 hours/day) compared to female students that spent more sitting time on watching television or video (4.79 hours/day). While on weekend, female has spent more sitting time on watching television or video (4.75 hours/day) than male students that spent on playing computer or video games (4.39 hours/day). Overall, undergraduate students also spend more sitting time on travelling by car, bus or train on weekdays because undergraduate students need to attend classes on weekdays. And they also spend more sitting time on writing paperwork or computer work on weekend. Owen et al. (2010) reported spending more time on desk and new innovations make life easier may actually pushing people closer to diseases.

Previous studies also mentioned about gender specific differences in regards to the amount of time spent by students playing computer or videos games. For example, a study by Wallmann-Sperlich et al., (2013) found that male students spent more time than female on playing computer or video games. Furthermore, the study also stated that female students spent more time watching television compared to male students. Both results aligned with sitting time comparison on weekdays and weekends but these results were mainly related to student type respondents. In regards of television or video viewing, the activity was the most

prevalent sedentary behaviour and it was highly consistent with other studies (Hills & King 2007).

In brief, undergraduate students have more sitting time on weekdays as compared to weekend. This showed that undergraduate students work similar just like desk based working adults that spending more on sitting time during weekdays. In the long run, this may increases the risk of negative health consequences.

4. CONCLUSION

The main purpose of this study was to compare sitting time between male and female undergraduate students. There were 375 ($N=375$) respondents that were students, involved in this study and all of them came from 16 different faculties. The results showed that there was no significant difference between both gender as $p>0.05$ ($p=0.231$); male respondents gained the results of $M=9.46$ hours/day, $SD=31.059$ while female respondents gained the results of $M=9.62$ hours/day, $SD=30.463$ in which $t = (406) = 1.199$ and $p = 0.231$ ($p>0.05$). The comparison of total sitting time on weekdays and weekends resulted that students spent more sitting time on weekdays compared to weekends. Furthermore, the recorded findings also portrayed that female students had higher total sitting time than male students with the accumulation result from both weekdays and weekends. This result was achieved even though there was no significant difference between male respondents and female respondents on the combined dependent variables; $F(2,405)=1.449$, $P=0.05$: *Wilks' Lambda*=.99; *partial eta squared*=0.007.

It was concluded that undergraduate students had similar sitting time to desk based working adults and they should be considered as target for intervention (Hills & King 2007). The current study found an average total weekly sitting time was 9.46 hours per day for male 9students and 9.64 hours per day for female undergraduate students. Rosenberg et al., (2010) recorded similar results of total weekly sitting time of 9.65 hours per day on university students. The study by Dogra et al., (2017); Uffelen et al., (2010) discovered that sitting more than 6 hours or more hours per day could shorten their lifespan. The data from the current study showed that the total sitting time was less on weekdays than weekends. The results showed there was no significant difference between student genders in weekdays and weekends. Hence, this result can be inferred as the students were sitting more on weekdays compared to weekends.

In order to reduce the amount of sitting time of students especially for undergraduate students, the university should organise physical activity programs that involve the students. This is especially on the weekdays with the focus on moderate activities due to longer hours of sitting time among undergraduate students. Although the findings suggested that the undergraduate students were highly sedentary and only a small amount of time was dedicated to an activity in and out of the classroom, the students would have a sitting time level equal to working adults. Therefore, they should be the targets for further investigations in order to reduce the sitting time before they become the working adults.

Throughout the completion of this study, there were some recommendations that could improve the future study regarding sitting time among undergraduate university students. Despite the challenge in generalizing the results to the entire undergraduate population, the current study makes meaningful contribution towards the study of undergraduate students' sitting time especially based on genders and their activities during weekdays as compared to the weekend. Future researchers should compare the sitting time between public and private university undergraduates because they are run by different entities, which have different management, culture and demographic of students. That may have influence on their sitting behaviours. In addition, future researchers should compare between athlete and non-athlete in the universities because the athlete may have more exercise or training but they could be

sitting too much. Through this environment change in university campuses, this can serve to increase the health of undergraduate students, which an important sub-group of the population in order to improve the health of all Malaysians.

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