
RESEARCH ARTICLE

The Impact of Commute on Students' Performance

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ABSTRACT

This study aimed to assess the prevalence of commuters in Gulf Medical University (GMU), the impact of length of commute on student's health, and the association between length of commute and academic performance. We conducted a cross-sectional study at Gulf Medical University in the Summer of 2018. It included students 18 years of age and above, regardless of gender, nationality, and year of study, enrolled across the various GMU programs, including Medicine, Dentistry, Basic Medical Science, Physical Therapy, Health Science, Nursing, and Pharmacy. Four hundred and twenty students actively participated in our self-administered questionnaire. Our study determined statistically significant associations between commute and a variety of factors such as physical difficulties, stress, the prevalence of accidents, sleep schedule, etc. Our study concluded that students having longer commutes experienced significant physical difficulties, higher levels of stress, and an increased risk of accidents. Furthermore, we found that students with increased commute times also seemed to lose sleep more frequently than those with shorter commute times. In addition, our study established that commute harms academic performance, as students who commuted for extended periods were shown to have decreased academic performance in addition to having less time to study.

KEYWORDS

Commute, Academic performance, Medical Students, Mental Health

ARTICLE INFORMATION

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1. Introduction

With growing urbanization (Department of Economic and Social Affairs, 2019), rising decentralization of suburban areas, and a year-after-year trend demonstrating an increase in the number of road motor vehicles (Timmons, 2022), the time people spend commuting has escalated over the past decade (United States Census Bureau, 2019; Central Statistics Office Ireland, 2016). In an age wherein almost, all college students travel to college using some form of transport, this poses severe potential drawbacks concerning academic performance, health, anxiety, and stress.

According to the Cambridge dictionary, a commuter is defined as someone who regularly travels between work and home (Commuter, 2022). Our study focuses on a particular subset of commuters, college students; these are students whose place of residence while attending college is not in a campus residence hall, fraternity, or sorority house.

Studies show that most students opt to commute every day instead of living on campus (Nelson et al., 2016; U.S. Department of Education, 1996). This can be due to a multitude of reasons, be it financial as dorms can be expensive to stay in, students preferring to be closer to family, lack of on-campus availability, etc.

There are many different forms of transport that students can utilize to get from their place of residence to their college or university, such as bus, tram, train, or car. It is essential, however, to keep in mind that in a city like Ajman, where our report was conducted, the various forms of public transport are limited.

This study aims to assess the commute's impact on student performance. This was measured by assessing the impact of commute duration on key performance indices, including academic performance, health outcomes, stress, and physical difficulty (McConnell et al., 2010; Hansson et al., 2011). Furthermore, it aimed to elucidate the various ways in which commute can be ameliorated and made more bearable. We felt as a group that it is vital to draw light to this tremendously important topic as we believe it represents a crucial area of socioeconomic interest. Commute time and duration can have an overall detrimental effect on a college student's academic performance, mental state, and physical well-being, which in turn have subsequent ripple effects on the broader populous (Nelson et al., 2016).

We believe that an enhanced understanding of commute and its implications on college students can aid policymakers and lawmakers in implementing efficient and sustainable transport systems for the average commuter, which can ease travel and its associated stressors.

2. Methodology

Research design: Cross-sectional study.

Study population: Students at Gulf Medical University (GMU)

- **Inclusion criteria:** GMU students above the age of 18 years who signed the informed consent form.
- **Exclusion criteria:** Students below the age of 18 years, Students who did not sign the informed consent form, and non-GMU students.

2.2 Sample size calculation:

- The formula used to calculate the sample size was $N = 4PQ/L^2$, where ($P = 0.5$, $Q = 0.5$, $L = 0.05$)
- The calculated sample size was 480 (including a 20% non-response rate)
- The total sample collected was 420, with a response rate of 87.5%

Study settings: Gulf Medical University campus, Ajman.

Duration of study: 6 months

2.3 Study instrument & validation procedure:

A Self-administered questionnaire was utilized, which enquired about the means, duration, and frequency of commute. Furthermore, it assessed the factors that affect student performance by including questions on health status, stress levels, and academic performance. The questionnaire underwent rigorous validation by three experts prior to its implementation.

2.4 Ethical issues:

A proposal was submitted for approval to the Institutional Review Board (IRB) of Gulf Medical University; once approved, participants were informed of the purpose of our study, and all participants gave voluntary consent prior to participation. Only researchers, members of the IRB, and the statistician had access to the data according to the research policy of Gulf Medical University, thus maintaining participant confidentiality.

2.5 Methodology:

Permission was taken from different colleges of GMU to permit their students to participate in our research project. The purpose of the study was explained to students, and a consent form and self-administered questionnaires were distributed. The investigators clarified any doubts or queries related to the research. Researchers thoroughly checked the filled-in questionnaires to reduce the probability of any missing information.

2.6 Data analysis:

Information gathered during data collection was entered into Microsoft Excel as numerical data. The data was then transferred to SPSS version 24. Descriptive statistics were done, and tables and graphs were created. A chi-square test was used to find the association.

3. Results

3.1 Prevalence of Commuters

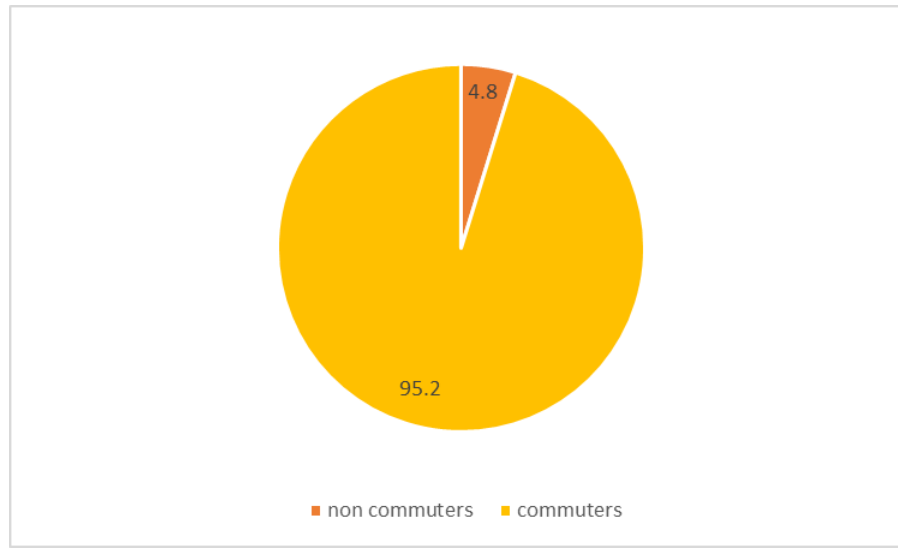


Figure 1: Distribution of commuters and non-commuters

Most participants in our study were found to be commuters (95.2%), whereas the percentage of non-commuters was far lower (4.8%). Non-commuters were selected based on those students who walked to college, whereas commuters were those who utilized any form of vehicular transportation (public transport, bus, car, etc.)

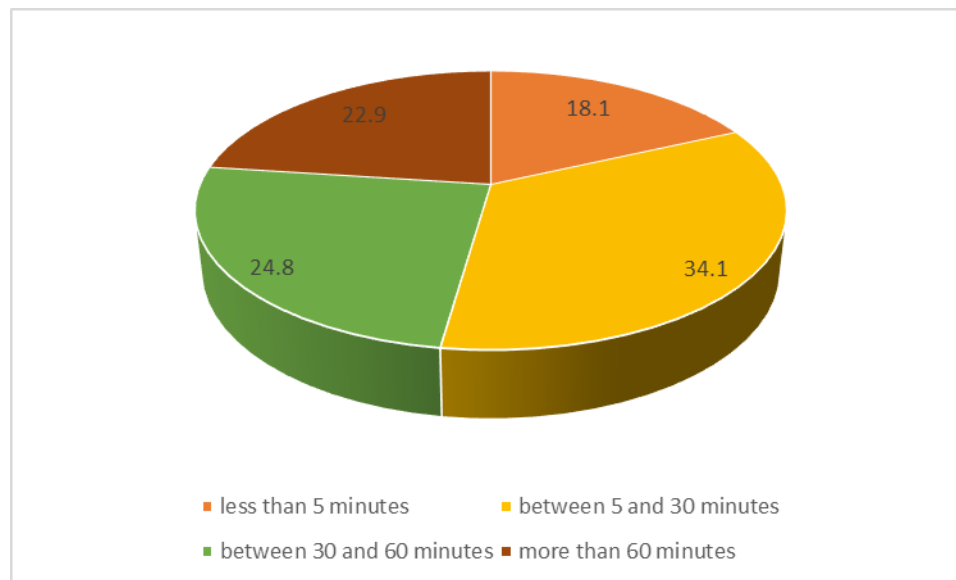


Figure 2: Distribution of commute length

The majority of commuters had a travel time between 5 and 30 minutes (34.1%), followed by those commuting between 30 and 60 minutes (24.8%), then more than 60 minutes (22.9%), and finally less than 5 minutes (18.1%)

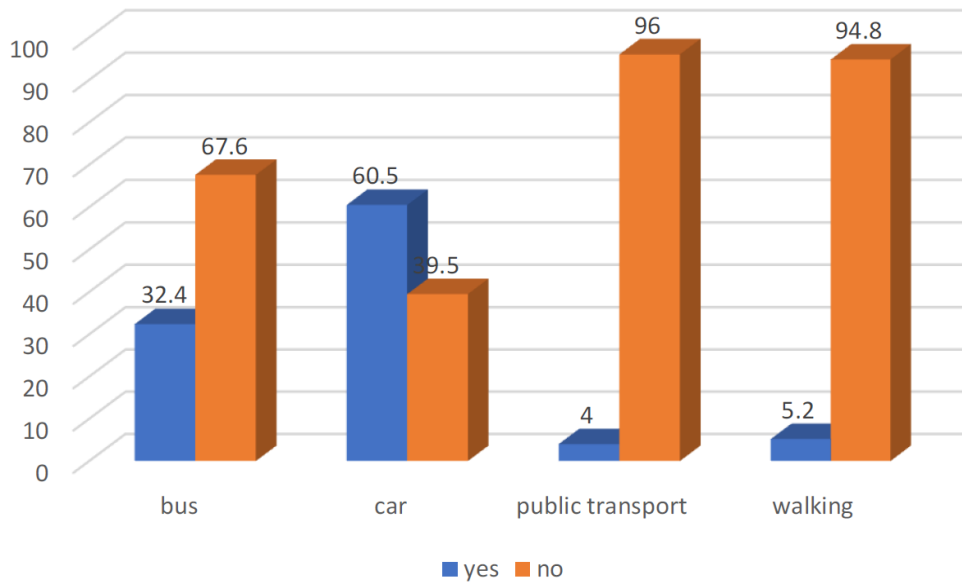


Figure 3: Distribution of modes of transport

Regarding the modes of transport, the car (60.5%) was the favorite, followed by the bus (32.4%), then walking (5.2%) and lastly public transport (4%).

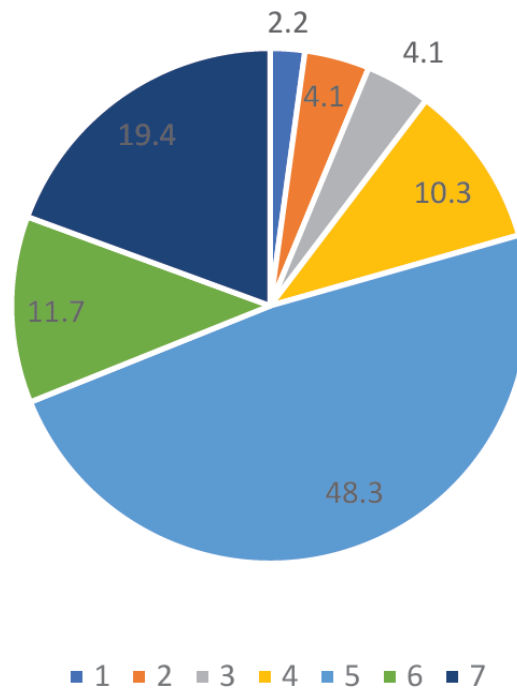


Figure 4: Distribution of frequency of commute

Most commuters actively commuted five days a week (48.3%), followed by those who commuted seven days a week and six days a week.

3.2 Effects of commute on health

Table 1: Association between physical difficulties and length of commute

			Length of commute				P value
			less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	more than 60 minutes	
Physical difficulties	Yes	% Within physical difficulties	15.4% (20)	30.8% (40)	19.2% (25)	34.6% (45)	<0.05
	No	% Within physical difficulties	19.4% (56)	35.4% (102)	27.4% (79)	17.7% (51)	

Table 2 demonstrates a statistically significant association between physical difficulties and commute length for students who commute for a duration greater than 60 minutes; a significant (**34.6%**) percentage experienced physical difficulties as compared to those who do not (**17.7%**)

Table 2: Association between weight gain and length of commute

			Length of commute				Statistical significance
			less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	more than 60 minutes	
Weight gain	Yes	% Within weight gain	16.3% (21)	34.9% (45)	24.0% (31)	24.8% (32)	N.S.
	No	% Within weight gain	18.8% (24)	35.9% (46)	25.0% (32)	20.3% (26)	
	idk	% Within weight gain	19.1% (31)	32.1% (52)	25.3% (41)	23.5% (38)	

There isn't a statistically significant association between weight gain and length of commute. Table 2 indicates that as the commute duration increases, there isn't a corresponding increase in weight gain, with the greatest weight gain being reported in students commuting 5-30 minutes (**34.9%**) followed by >60 minutes (**24.8%**).

Table 3: Association between stress and length of commute

			Length of commute				P value
			Less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	60 minutes or more	
How stressful	Mild	%Of how stressful	24.1% (33)	34.3% (47)	29.9% (41)	11.7% (16)	<0.001
	Moderate	%Of how stressful	14.9% (26)	36.6% (64)	25.1% (44)	23.4% (41)	
	severe	%Of how stressful	17.3% (17)	27.6% (27)	17.3% (17)	37.8% (37)	

Our study showed a statistically significant association between stress and commute length for students who commute for a duration greater than 60 minutes daily, with the majority reporting severe stress levels (**37.8%**) compared to those who reported mild levels (**11.7%**).

Table 4: Association between the prevalence of accidents and length of commute

			Length of commute				P value
			Less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	60 minutes or more	
Accident	Yes	% Within accident	12.5% (20)	34.4% (55)	30.6% (49)	22.5% (36)	<0.05
	No	% Within accident	21.7% (56)	33.7% (87)	21.3% (55)	23.3% (60)	

Our study found that the majority of students commuting between 5 and 60 minutes reported an increase in accidents. The same cannot be said for those students commuting more than 60 minutes and those commuting less than 5 minutes.

Table 5: Association between sleep schedule and length of commute

			Length of commute				P value
			less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	more than 60 minutes	
Sleep schedule	No	% Within sleep schedule	17.1% (20)	41.9% (49)	25.6% (30)	15.4% (18)	<0.05
	Occasionally	% Within sleep schedule	20.5% (36)	31.3% (55)	28.4% (35)	19.9% (35)	
	Mostly	% Within sleep schedule	15.3% (13)	36.5% (31)	20.0% (17)	28.2% (24)	
	All the Time	% Within sleep schedule	16.7% (6)	19.4% (7)	19.4% (7)	44.4% (16)	

There is a statistically significant association between sleep schedule and length of commute. Students with increased commute duration (**44.4%**) were shown to lose sleep more frequently than those with reduced duration of commute (**17.1%**).

3.3 Effect of commute on academic performance

Table 6: association between academic performance and length of commute Cross tabulation

			Length of commute				P value
			less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	more than 60 minutes	
Academic performance	Yes	% Within academic performance	14.8% (18)	25.4% (31)	23.8% (29)	36.1% (44)	<0.001
	no	% Within academic performance	19.5% (58)	37.7% (112)	25.3% (75)	17.5% (52)	

Our study found a statistically significant association between academic performance and length of commute for students who commuted more than 60 minutes, as the majority (**36.1%**) reported it had a negative impact on their academic performance compared to those who reported no effect (**17.5%**).

Table 7: Association between time to study and length of commute

			Length of commute				P value
			Less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	60 minutes or more	
Time to study	Always	% Within time to study	34.5% (20)	43.1% (25)	17.2% (10)	5.2% (3)	<0.001
	Often	% Within time to study	22.4% (28)	34.4% (43)	21.6% (27)	21.6% (27)	
	Sometimes	% Within time to study	12.8% (21)	32.3% (53)	31.15 (51)	23.8% (39)	
	Rarely	% Within time to study	9.9% (7)	29.6% (21)	22.5% (16)	38% (27)	

There is a statistically significant association between study time and commute length. The table above indicates that students who commute less than 5 minutes a day frequently reported always having enough time to study (**34.5%**). In contrast, a substantial proportion of students who commuted for more than 60 minutes daily reported they rarely (**38%**) had enough time to study.

3.4 Effect of commute on social health

Table 8: Association between social circle and length of commute

		Length of commute				P value
		less than 5 minutes	between 5 and 30 minutes	between 30 and 60 minutes	more than 60 minutes	
Social circle	Yes	15.5% (22)	34.5% (49)	26.8% (38)	23.2% (33)	NS
	No	18.7% (51)	34.4% (94)	24.2% (66)	22.7% (62)	

There isn't a statistically significant association between social circle and length of commute as there doesn't seem to be any substantial difference among students with commute durations greater than 60 minutes which report an effect on their social circle (**23.2%**) vs. no effect (**22.7%**). The same can be said for commute durations ranging from <5 minutes - 60 minutes.

4. Discussion

4.1 Prevalence of Commuters

Our study was conducted on the premises of Gulf Medical University to determine the prevalence of commute and its effects on health science students. It consisted of a sample size of 480 students, distributed amongst the various medical courses at GMU. Four hundred twenty students actively participated in our self-administered questionnaire.

Our analysis revealed that an incredible 95.2% of the participants were commuters, which is relatively high in comparison to other college students (86%)(U.S. Department of Education, 1996)

The majority of students we surveyed had a travel time spanning between 5 and 30 minutes (34.1%), with the smallest subset of students having a travel time of less than 5 minutes (18.1%) [Figure 2]. This aligns with census data from the American Community Survey (ACS), showing that the average duration of a one-way commute in 2019 was 27.6 minutes (United States Census Bureau, 2019).

The majority (60.5%) of GMU students stated that the car was their desired mode of transport [Figure 3]. This is lower than other population-based surveys assessing which mode of transport is preferred. One study done in the United States showed that 88% of the populous own cars (Poushter, 2015). However, it is necessary to consider that college students tend to have fewer funds and limited income streams to afford a private vehicle.

We found that most GMU students travel five days a week (48.3%) because, at GMU, classes are relegated to weekdays. Although the library is open to students on weekends, most students have a propensity to stay home during the weekends—[Figure 4].

4.2 Effects of commute on health

Our study concluded a statistically significant association between commute and the experiencing of physical difficulties. The highest percentage of students experiencing physical difficulties (34.6%) were found to commute more than 60 minutes. A study done in Scania, Sweden, showed that longer commute times could have detrimental effects on health, including increased stress, fatigue, sleep disturbances, etc. (Hansson et al., 2011)

Another study done surveying Norwegian Train Drivers and Railway Workers investigated the relationship between commute and adverse health effects and found that those who commuted for an hour or more each day experienced a significantly increased number of health complaints compared to colleagues with shorter commutes (Urhonen et al., 2016)

Our study also revealed no association between weight gain and length of commute; as commute duration increased, the percentage of students reporting weight gain did not increase, with the highest percentage of students with weight gain (34.9%) commuting between 5 and 30 minutes.

A study done at the university of western Ontario found no association between commute duration and impact on physical activity and body weight. However, there was an association found for students using active modes of commute in which there appeared to be a slight weight change. (Mitchell et al., 2016)

Our study determined an association between stress levels and commute duration. Students who commuted for prolonged periods were found to have higher stress levels (37.8%) compared to those with shorter commutes (24.1%).

These findings correlate with a study done by the united kingdom's office of national statistics, which reported that long commuters suffer from higher levels of stress and anxiety compared to those with shorter commutes (The National Archives, 2014)

Our study found an association between the prevalence of accidents and commute length. Students with longer commute durations were found to have a higher incidence (22.5%) of accidents compared to those with shorter durations (12.5%)

Our study found that there is an association between sleep schedule and length of commute. The highest percentage (44%) of students reported that they lost sleep all the time commuted more than 60 minutes.

A study done by the Sonea municipality of Tanzania on high school students found that students with longer commute durations experienced heightened fatigue and exhaustion, causing poor academic performance (Adepoju et al., 2011)

4.3 Effects of commute on academic performance

Our study revealed a negative association between academic performance and length of commute. The vast majority of students with increased commute duration reported it harmed their academic performance (36.1%), compared to those who reported no effect (17.5%). These findings are supported by a study that surveyed school-going children in Brazil, demonstrating a negative correlation between commute duration and academic performance. (Adepoju et al., 2011)

A negative connection was found between time to study and length of commute. The most significant percentage of students reporting that they rarely had adequate time to study (38%) were found to commute more than 60 minutes.

A study done in the U.K. found that commuting every day was linked to poor student academic performance. Almost 66% of the students in the survey commuted daily, with more than half of them reporting that they could not focus on their studies. (Hansson et al., 2011)

4.4 Effects of commute on social health

Our study didn't find a statistically significant association between commute length and social circle. Students with commute durations greater than 60 minutes who reported an effect on the social circle were 23.2%, while students who reported no effect were 22.7%, respectively.

5. Conclusions

Our study aimed to assess the impact that commute had on critical factors of student performance such as academic performance, physical health, and social well-being. Our results showed that commute has a generalized negative effect on students' health and academic performance. We believe the insights yielded by this paper can be used to create awareness of commute's detrimental effects and hopefully encourage policymakers to implement strategies aiding in the development of infrastructure encouraging reduced commute duration. Our study was limited in so far as it was conducted within the premises of Gulf Medical University and, therefore, may not accurately reflect the experiences of all college students. Lastly, we believe further research undertaken in this area should survey a larger population as the study pool we surveyed for this paper was relegated to one university.

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Conflicts of Interest: The authors declare no conflict of interest.

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Ethical approval: This study has been approved by the Institutional Review Board (IRB) of Gulf Medical University

Informed consent: All participants were informed of the purpose of our study, and all participants gave voluntary consent prior to participation.

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