



The Study of Quality of Life Among Medical Students in Universiti Tunku Abdul Rahman During the COVID-19 Pandemic

Xin LP, Boon YC, Jit LT, Wan HT, Soe YN, Swe KMM* and Phyu HP

Department of Population Medicine, University Tunku Abdul Rahman, Malaysia

*Corresponding Author: Swe KMM, Department of Population Medicine, University Tunku Abdul Rahman, Malaysia.

DOI: 10.31080/ASMS.2023.07.1453

Received: January 03, 2023

Published: January 18, 2023

© All rights are reserved by Swe KMM., et al.

Abstract

Introduction: Maintaining a good quality of life is an important component when studying medicine. However, the COVID-19 pandemic has brought a negative impact on the quality of life among medical students. Thus, studies need to be done to assess their quality of life and to generate effective measurements to overcome this issue.

Objectives: To describe the socio-demographic profile of the UTAR MBBS students, to determine the prevalence of the quantity of life among respondents, and to determine the association between quality of life and the sociodemographic characteristics among respondents.

Methods: A cross-sectional study was conducted among medical students at Universiti Tunku Abdul Rahman using the WHOQOL-BREF instrument [44].

Results: A total of 151 students participated in this study, with (63.6%) females and (36.4%) males of mean age between 21-25 years. Among all respondents, 23.2% were year 1 students, 25.2% year 2, 5.9% year 3, 17.2% year 4 and 18.5% year 5 students. The environmental domain has the highest mean score (74.95) among all domains of quality and life. In general, Year 2 students, living in a house or apartment, students living with families, students of M40 household income, and students without the presence of congenital disease showed a higher score of quality of life in the environmental domain.

Conclusions: The overall quality of life of medical students in UTAR was good, indicating that they were not affected much by the pandemic. However, it is still advised to continuously monitor and support students during the pandemic, to further improve their quality of life.

Keywords: Pandemic, Quality of Life, Medical students

Introduction

Maintaining a good quality of life is important as this improves the overall well-being including life domains related to work, finances, emotional health, physical health, and social well-being of everyone. People with better overall well-being will have higher life satisfaction and simply enjoy life more. Good quality of life will bring happiness and subsequently lead to higher productivity and task performance.

According to Tempiski, *et al.* 2012, quality of life (QOL) is a multidimensional tectonic that includes joyfulness, life satisfaction, healthy idiosyncrasies, social relationship, and freedom [39]. The quality of life is also a significant predictor of persistence in overall health and well-being [5]. The key defining factor for medical students' quality of life is being able to manage time well and able to achieve their goals in their life.

However, the widespread of COVID-19 in 2020 had posed a huge impact on millions of people around the world, medical students are no exception. Medical students are expected to acquire learning experience through hands-on practical or clinical sessions. With the implementation of movement control order (MCO) in Malaysia throughout the COVID-19 pandemic, physical classes are restricted, and learning for all students in tertiary education is carried out remotely via online or blended systems. This eventually causes the medical students to fail to gain sufficient bedside experience.

Not only medical education is affected but also physical health, psychological, social relationship, and living environment. Lockdown measures affect the lifestyles and daily routine of medical students, as well as limit physical interaction and sports activities. Besides that, a long duration of quarantine may cause losing motivation and eventually lead to a negative psychological impact. Reducing income and parents' job loss poses an impact on medical students. This is because family income is one of the sources of tuition fees, with reducing income, medical students are unable to sustain high tuition fees. The quality of life is considered important for medical students during this COVID-19 crisis, and it may be closely related to challenges experienced by medical students. There is a lack of studies regarding the impact of COVID-19 on medical students' quality of life. Hence, it is essential to find out the impact of COVID-19 on the quality of life among medical students.

The study aimed to investigate the impact of the COVID-19 pandemic on the quality of life among UTAR MBBS students in Sungai Long, Malaysia, and the objectives were to describe the socio-demographic profile of the UTAR MBBS students, to determine the prevalence of the quantity of life among respondents and to determine the association between quality of life and the sociodemographic characteristics among respondents.

Literature Review

Covid-19 pandemic trends

Coronavirus disease 2019 (COVID-19) is a respiratory disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that first occurred in Wuhan, Hubei Province, China [42]. As of July 5, 2021, there have been 183,368,584 confirmed cases of COVID-19 reported globally [43].

In Malaysia, until July 5, 2021, 785,039 confirmed cases were being recorded, with 5,575 deaths and 710,018 recoveries, leaving 69,447 active cases. The current value of R_0 in Malaysia is 1.06 [27]. Movement Control Order (MCO), a cordon sanitaire, had been implemented by the Malaysian government on 18th March 2020 as a preventive measure against COVID-19. With the implementation of MCO, nationwide movements and mass gatherings including in the education sector were all prohibited [37]. Nonetheless, because of the increasing number of daily COVID-19 cases, enhanced MCO (EMCO) had been implemented in Klang Valley.

Life of medical students

The medical course is a well-known course that is generally more intensive due to the longer duration to complete as compared to other courses [19]. In medical school, 2 sections are involved in a 5 years MBBS program which is pre-clinical and clinical years. Packed timetable and a variety of subjects such as anatomy, physiology, pathology, microbiology, biochemistry, pharmacology, etc which is under a pre-clinical year, had built those medical students who had a consistently high level of focus and were willing to sacrifice their time in favour of study time. After nurturing basic skills and knowledge of medical students to get them prepared for hospital experience in the first two preclinical years, approaching real patients and covering major clinical specialties, such as internal medicine, surgery, neurology, oncology, etc, will then come in as clinical years [36].

The life of medical students is full of stress, they would always worry not only about their own academic and professional performances, but also concern themselves with social and economic issues. According to Educationmalaysia.gov.my, 2019, MBBS courses had the highest tuition fees in public and private Malaysian universities, thus, there will be an impact on those students that have a low household income [16]. As household income has a close linkage in which a student can support the academic needs, develop study manners and study habits and is correlating to academic success. Besides, lifestyles characteristic of medical students demonstrated that hours spent on movies and music, hours spent online not related to college, most accurate time spent on hobbies, smoking, consuming caffeinated beverages, social life, co-curricular, conference, and reading after universities hours had a huge different compared to other courses' students as well [2].

Therefore, it is not surprising they will experience a high risk of mental health as well as affect their quality of life such as physical health, psychological, social relationship, and environment [39].

The challenging situation in the campus/training

Given the aggravation of the pandemic, a movement control order (MCO) had been implemented to halt the spread of COVID-19. However, the measures implemented have taken a toll on the everyday lives of millions of people, in terms of physical health, mental health, environment, and social relationships. It is important to discover the immediate and long-term impact of the COVID-19 pandemic on medical students as it may impact the quality of life of medical students.

With the closure of higher educational institutions, medical student education at both preclinical and clinical levels has been heavily disrupted and this has been stressful for many medical students [34]. Virtual learning might negatively affect the academic performance of medical students which were linked to their quality of life. A study showed that both female and male medical students were emotionally detached from family, fellow professionals, and friends, and also the overall study performance was decreased [27]. There is a relationship between health and quality of life in which students with good mental and physical health will have a better quality of life. A study conducted at the University of Cyprus reported a significant increase in burnout prevalence among final year medical students during online learning [50], this consequently results in a lower quality of life [26]. On the contrary, a study demonstrated a lower prevalence of burnout among medical students in all study groups during online learning [10]. Additionally, online learning has been challenging for clinical year students as clinical education such as clerkship is difficult to be delivered virtually. The academic disruption experienced by medical students might increase their anxiety symptoms which were linked with lower physical health-related quality of life [1].

The lifestyle of medical students has been greatly affected during the isolation period. Changes in lifestyle such as reduced physical activity and unhealthy diet can be seen among medical students. Nine out of ten studies included in the systematic review showed significant decreases in physical activity levels during lockdown [25]. On the contrary, sedentary behavior is found to be increased, and will eventually lead to lower quality of life. Previous studies

demonstrated that physical activities were positively associated with quality of life [33]. Therefore, the restriction of daily activities during this unprecedented time could potentially lead to low quality of life. Quality of life can also be affected by poor sleep quality and poor diet, which can be found in medical students who are worrying about the negative impact of COVID-19 on education. Additionally, a study reported that people with comorbidities had a lower health-related quality of life [29].

The social relationship is one of the predictors of quality of life. Social support has been identified as a protective factor against stressful situations such as disease outbreaks and disasters [24]. students are staying alone in rented accommodation throughout the pandemic. Loneliness and lack of social support will harm the quality of life of students [6]. According to Hwang, *et al.* friends were the main category affecting medical students' quality of life [21]. Furthermore, restriction of social activities will contribute to lower social relationship quality of life because it limits social interactions.

Changes in the learning environment could have a potential impact on the quality of life among medical students. Other than academic stress, medical students who are staying at home might encounter additional stress from home such as doing house chores and taking care of younger siblings. Parental job loss and financial loss caused by lockdown measures could result in a negative psychological impact on medical students. This is because medical students may not be able to sustain a high amount of tuition fees during the COVID-19 crisis. Furthermore, medical students who are living in areas with a high number of COVID-19 cases might increase their psychological stress, because there is a higher risk of being infected. Excessive and prolonged stress will lead to burnout, which in turn causes a low quality of life.

How to overcome

These changes, without a doubt, have greatly affected medical students physically and psychologically. To overcome this issue, the United States has implemented some strategies such as sending emails to stay connected with students, carrying out surveys to assess students' mental health, and offering counseling services have been implemented to support their mental well-being [12]. As a result, students showed up to have lesser anxiety and stress during the pandemic.

Besides that, technology has played an important role in responding to medical education during the COVID-19 pandemic. The transition to remote learning has made students highly rely on digital tools such as computers, Google, Microsoft teams, etc. to continue engaging with their academic learning. For example, video-based communication platforms such as Microsoft teams, Google meets, and Zooms were being used to carry out online lectures. Furthermore, online attempts to substitute hands-on education have been made, including demonstrations of practical procedures, remote patient consultation programmes, and simulated cases [31].

Methodology

A cross-sectional study was conducted on MBBS students at University Tunku Abdul Rahman in the year 2021. There were 217 MBBS students (year 1 to year 5) studying in the academic year 2020/2021 and all the students were invited to participate in the study.

The WHOQOL-100 quality of life assessment was used as the study tool in this research project. The WHOQOL-BREF instrument is a self-administered questionnaire, comprised of 26 items, to assess the four major QoL domains defined by the WHO; physical health, psychological health, social relations, and environment (Ref) [44]. The first two items separately assess the overall perception of QoL and health.

The tool follows a scoring system, where each question is rated on a 5-point Likert scale, ranging from 1 (very poor/very dissatisfied/none/never) to 5 (very good/very satisfied/extremely/always), and then the scores of all four domains are summed and scaled in a positive direction, with higher scores indicating better QoL (Ref). The Cronbach's alpha values for the physical health domain, psychological domain, social relationship domain, and environment domain are 0.80, 0.76, 0.66, and 0.80 respectively, demonstrating good internal consistency.

Google form was used to collect data from respondents. Informed consent was taken. The Google form will include socio-demographic and the WHOQOL-100 questionnaire.

IBM Statistical Package for Social Sciences (SPSS) version 26.0 was used to analyse the data collected. The statistical analysis of this study was divided into two parts. A descriptive analysis

of demographic data was carried out, where the scores of each domain were transformed into a linear scale that ranged from 0 to 100, and then represented as means and standard deviations of the total scores. Lastly, the QoL scores for each domain were compared via t-test and one-way analysis of variance (ANOVA), and a significant difference was set at a P-value of ≤ 0.05 .

Results

Participants' characteristics

A total of 151 students responded, with a 70% response rate where females and males constituted 96 (63.6%) and 55 (36.4%), respectively. Their mean age was between 21-25 years. Among all respondents, 35(23.2%) were year 1 students, 38 (25.2%) year 2, 24(15.9%) year 3, 26(17.2%) year 4 and 28 (18.5) were year 5 students. The sociodemographic characteristics of students were shown in table 1.

Domain scores of quality of life

WHOQOL-BREF questionnaires have divided into four domains such as domain 1, physical health which include factors such as activities of daily living, dependence on medicinal substances and medical aids Energy and fatigue, mobility, pain and discomfort, sleep and rest, and work capacity, domain 2, psychological health which includes factors such as body image and appearance, feelings, self-esteem, spirituality/Religion/Personal beliefs, thinking, learning, memory and concentration, domain 3, social relationships which included factors such as personal relationships social support and sexual activity and domain 4, environment health such as financial resources, freedom, physical safety and security, health and social care: accessibility and quality, home environment, participation in and opportunities for recreation/leisure activities and physical environment (pollution/noise/traffic). Figure 1 illustrated that among the domains of quality of life, the environmental domain has the highest mean scores among all domains of quality of life.

QoL Scores for students per student's characteristics

Regarding QoL domains, the QoL scores for each domain were compared via t-test and one-way analysis of variance (ANOVA) and illustrated in Table 3. According to the results, the environmental health domain has the highest mean scores among all domains in terms of gender but there are no significant differences in the relation between gender and the mean scores of all domains of

| Variables | N(%) |
|------------------------------|-----------|
| Academic year | |
| Year1 | 35(23.2) |
| Year2 | 38 (25.2) |
| Year3 | 24(15.9) |
| Year4 | 26(17.2) |
| Year5 | 28 (18.5) |
| Age Group | |
| 16-20 | 30(19.9) |
| 21-25 | 117(77.4) |
| 26-30 | 4(2.7) |
| Gender | |
| Male | 55(36.4) |
| Female | 96(63.6) |
| Residential area | |
| Hostel | 46(30.5) |
| House/apartment | 105(69.5) |
| Household income (per month) | |
| B40 (<RM4,850) | 42(27.8) |
| M40 (RM4,850 - RM10,959) | 87(57.6) |
| T20 (> RM10,959) | 22(14.6) |
| Living status | |
| Stay alone | 13(8.6) |
| Stay with family | 104(68.9) |
| Stay with friends | 34(22.5) |
| Presence of comorbidities | |
| No | 147(97.4) |

| | |
|--|-----------|
| Yes (hypothyroidism, Prediabetes, prehypertension, overweight) | 4(2.6) |
| Diet preference (Eating habit during a pandemic) | |
| Fast food | 10(6.6) |
| Home cooked food | 133(88.1) |
| On diet | 8(5.3) |
| Physical exercise during a pandemic | |
| No exercise | 61(40.4) |
| 15 mins/day | 42(27.8) |
| 30 mins/day | 30(19.9) |
| 45 mins/day | 9(6) |
| 1 hr/Day | 9(6) |

Table 1: Sociodemographic characteristics of the students (N = 151).

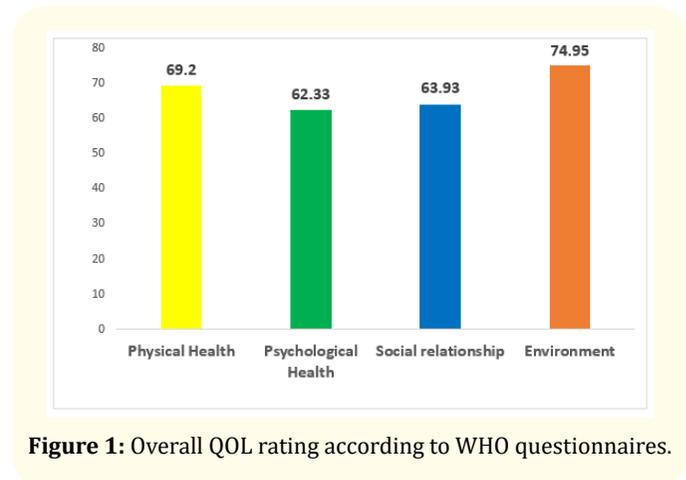


Figure 1: Overall QOL rating according to WHO questionnaires.

| Variables | N (%) | Physical Health | | Psychological Health | | Social Relationships | | Environment | |
|---------------|------------|-----------------|---------|----------------------|---------|----------------------|---------|---------------|---------|
| | | Mean ± SD | P-value | Mean ± SD | P-value | Mean ± SD | P-value | Mean ± SD | P-value |
| Gender | | | | | | | | | |
| Male | 55 (36.4%) | 69.78 ± 17.12 | 0.742 | 63.55 ± 19.64 | 0.529 | 61.05 ± 18.91 | 0.128 | 73.24 ± 16.22 | 0.332 |
| Female | 96 (63.6%) | 68.86 ± 16.03 | | 61.64 ± 16.80 | | 65.57 ± 16.55 | | 75.93 ± 16.41 | |
| Academic Year | | | | | | | | | |
| Year 1 | 35 (23.2%) | 70.51 ± 16.72 | .007 | 65.26 ± 16.04 | .002 | 61.63 ± 18.22 | .025 | 74.51 ± 16.63 | .020 |
| Year 2 | 38 (25.2%) | 75.50 ± 12.72 | | 69.00 ± 14.16 | | 71.74 ± 16.31 | | 81.08 ± 14.93 | |
| Year 3 | 24 (15.9%) | 69.96 ± 17.74 | | 61.83 ± 16.18 | | 63.83 ± 13.05 | | 69.92 ± 17.43 | |
| Year 4 | 26 (17.2%) | 66.50 ± 12.87 | | 60.15 ± 20.66 | | 60.35 ± 16.40 | | 77.27 ± 13.27 | |
| Year 5 | 28 (18.5%) | 60.86 ± 18.93 | | 52.07 ± 19.08 | | 59.61 ± 20.12 | | 69.32 ± 17.13 | |

| Residential area | | | | | | | | | |
|----------------------|----------------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|
| House/ Apt | 105 (69.5%) | 71.34 ± 15.93 | .015 | 64.86 ± 16.74 | .008 | 65.93 ± 17.22 | .033 | 77.66 ± 15.28 | .002 |
| Hostel | 46 (30.5%) | 64.30 ± 16.53 | | 56.57 ± 19.10 | | 59.35 ± 17.54 | | 68.76 ± 17.13 | |
| \Living status | | | | | | | | | |
| Stay with family | 104 (68.9%) | 72.34 ± 15.37 | 0.002 | 65.84 ± 16.09 | 0.001 | 65.52 ± 17.55 | 0.283 | 77.88 ± 14.6 | 0.004 |
| Stay with friends | 34 (22.5%) | 61.94 ± 15.98 | | 53.00 ± 17.75 | | 60.12 ± 18.25 | | 67.97 ± 17.0 | |
| Stay alone | 13(8.6%) | 63.08 ± 18.67 | | 58.69 ± 22.90 | | 61.92 ± 14.58 | | 69.77 ± 20.13 | |
| Household income | | | | | | | | | |
| B40 | 42 (27.8%) | 66.31 ± 15.10 | 0.310 | 58.07 ± 19.26 | 0.087 | 61.93 ± 18.61 | 0.360 | 71.64 ± 14.52 | 0.039 |
| M40 | 87 (57.6%) | 70.90 ± 16.56 | | 65.05 ± 16.30 | | 63.74 ± 16.84 | | 74.63 ± 17.0 | |
| T20 | 22 (14.6%) | 68.00 ± 17.81 | | 59.73 ± 19.67 | | 68.50 ± 18.04 | | 82.50 ± 15.12 | |

Table 2: Relation between QoL Scores and sociodemographic characteristics of the students.

quality of life. With regards to academic years, the environmental health domain has also the highest mean score among all domains, and year 2 students rated the higher quality of life scores in all aspects of the domain compared to the students from other academic years and it was statistically significant with p value<0.05.

With regards to a residential area, the environmental domain has the highest mean scores among all domains, and the students living in houses or apartments showed higher quality of life scores in all aspects of domains compare to the students living in a hostel. Concerning living status, the environmental domain has the highest mean scores among all domains, and the students living with family rated the higher quality of life scores in the domain such as physical health, psychological, and environmental compared to the students living with friends or living alone.

Regarding household incomes, the environmental domain has the highest mean scores among all domains, and the students with M40 household income had a good quality of life in the domain such as physical health, and psychological, compared to the students with B40 and T20 household income. Regarding the presence of congenital diseases or inherited diseases such as asthma or G6PD, the environmental domain has the highest mean scores among all

domains, and the students with the underlying disease had rated poor scores of qualities of life in the domain such as physical health, and psychological health, compared to the students who haven't had congenital diseases or inherited diseases.

Discussion

All four domains of quality of life showed a relatively similar mean score in this study. However, the environment has the highest mean score (74.95) among the four domains. This result indicated that students' physical health, psychological health, and social relationships have been slightly affected during the COVID-19 pandemic. The implementation of the Movement Control Order (MCO) during the COVID-19 pandemic, has put students into social isolation as traveling and gathering were restricted. In addition to that, the closure of higher educational institutions and switching to virtual learning also caused stress and anxiety to medical students, especially clinical year students, whose exposure to clinical training has been reduced. On top of that, this stress and anxiety could also disrupt their quality of sleep and rest which in turn affected their physical health.

The first and foremost characteristic, that is gender, showed no association with any of the aspects of the QoL assessment. This

finding is however inconsistent with the previous study conducted by Zhang, *et al.* in 2012 [51]. It can be explained by the fact that the study tool used in this study, the WHOQOL-BREF questionnaire, has no gender-specific questions being asked to the respondents. Therefore, both male and female medical students in UTAR are having similar scores in each aspect of QoL. However, there were studies conducted with the use of tools that are tailored for medical students which consisted of examinations, contact with patients, autopsy, relation with teaching staff, and others [8]. Interestingly, it was found that female medical students experience more stress than males. Future studies may make use of this tool and assess the effect of stress on QoL among medical students.

A study showed students aged group between 26 – 30 years were significantly associated with poorer quality of life in the domain of social relationships as compared to young students. The COVID-19 pandemic had led to reduced social contact and support among medical students. Due to lockdown, students have to separate from their families and loved ones, losing connections with each other and causing loneliness and isolation.

Academic years of medical students are shown to have a significant association with QoL in aspects of physical health, psychological health, and environment. This finding is consistent with that of the study conducted by Zhang, *et al.* (2012) [51]. This can be supported by the evidence that medical students in clinical years may have worse quality of life after encountering pain, death, suffering, and harsh social realities during their clinical practices [39]. Nonetheless, as medical students progress in the academic year, they may have increased frustration with their studies and insecurity regarding their future profession. On deeper insight, it was found that Year 2 medical students are having the highest score among all academic years. This may be because Year 2 students in UTAR have no major examination (i.e., professional exam) and are yet in preparation to enter the clinical year. Without having to struggle with examination and clinical practices, Year 2 students may have reduced stress as compared to others and therefore a better QoL score. Still, future authorities may make good use of this finding in establishing an association between academic stress and QoL.

Most of the medical students in UTAR, as well as most respondents in the study, were found to be Chinese (89.4%). There

was only a small percentage of students who were Indian (9.3%), Malay (0.7%), and Siam (0.7%). Therefore, with such bias on one ethnicity in this study, no significant association between race and QoL was shown in all aspects. Throughout the year, medical courses, as well as other courses in UTAR were having Chinese students out counted as compared to students from other ethnicities. This may be because the UTAR campus is geographically located in a town crowded with the Chinese population. Cultural factors such as language, food, and accommodation have thence encouraged more Chinese students to enroll in UTAR. Hence, it may be difficult to observe a significant association between race and QoL if students from one single discipline were being studied alone. Future authorities may open the opportunity to medical students from other universities as well to establish the actual effect of race on QoL.

With regards to the residential area, students living in houses or apartments showed higher quality of life scores in all aspects of domains compare to the students living at the hostel. Students tend to have better physical health when living in a house, because of a more hygienic and comfortable environment that has always been maintained by the family. A clean-living environment could prevent students from getting infectious diseases caused by harmful microbes, vectors, or pests. In terms of the living environment, students living at the house might have easier access to facilities or services such as health care, pharmacies, groceries, etc. which is important during the COVID-19 pandemic when traveling is being restricted. Finally, the hostel where students are staying is located in the town and beside a big road where many cars are passing by every day. This contributes to noise and air pollution which eventually leads to lower quality of life as compared to those living in a house or apartment.

Household income was statistically significantly associated with the environment domain. However, the association between household income and physical health, psychological health, and social relationships was not statistically significant. With regards to the environment domain, T20 has the highest mean score whereas B40 has the lowest mean score among the three household groups. Our finding was supported by another study which indicated students with better economic class reported significantly better environmental scores. There were a few reasons that support the positive association between household income and the

environment domain. Students with higher household incomes are more easily able to afford regular and nutritious food which tends to be more expensive than fast foods. Besides that, students with higher household income might have better access to sports or gym facilities which may help to maintain their health. With regards to transportation, students with lower household income will often take public transport instead of private cars which tend to be more expensive. Additionally, students who have better household incomes can easily afford better electronic devices such as smartphones, tablets, and laptops. The new normal in education has made electronic devices extremely important, students with better electronic devices can have a better learning experience.

Concerning living status, students living with families rated the higher quality of life scores in the domain such as physical health, psychological, and environmental compared to the students living with friends or living alone. This can be explained by a few reasons. First of all, students living with family have the privilege of getting healthy and freshly cooked food prepared as compared to students who are living at the hostel who hardly have time to prepare a meal themselves with those tight schedules. Second, staying with family is believed to have a better study environment. This is because they have family members to maintain the cleanliness of the house. This can ensure good physical health conditions among students and help them to focus well on their studies. Besides, students could easily get physical or emotional support from their family members when facing a hard time, especially during this COVID-19 pandemic, where students are struggling with their academics and worried about their future.

Students with the presence of congenital disease were significantly associated with poorer quality of life in the domain of physical health (vs without $p = 0.002$) and psychological health (vs without: $p = 0.000$). Students with the presence of congenital diseases such as G6PD, haemorrhoid, ASD, and asthma, had poor physical health and psychological health possibly because the diseases may increase susceptibility to infection, and it will be a very vulnerable situation for those students, especially at this pandemic period. For example, infection is the most common factor causing acute haemolytic anaemia in patients with G6PD deficiency, as infection whether bacterial, viral, or fungal, will produce reactive oxygen species through the inflammatory response, to which G6PD deficiency patients are particularly susceptible. Besides, asthmatic

students will have a bad impact on mental health, especially at the beginning of COVID-19, as they think they will be more vulnerable to this infection and will be very stressed in preventive measures and committed to quarantine to avoid infection. Therefore, the fear of getting COVID-19 infected could be caused by the students facing poor physical and psychological health such as getting negative thoughts, insomnia, fatigue, and self-esteem.

The current mode of payment was not statistically significantly associated with all domains of quality of life. This indicates that the quality of life among medical students will not be affected by the mode of payment. Supporting reasons could be that the majority of our respondents obtained PTPTN loans and are sponsored by family members, so respondents do not need to worry about the source of tuition fees. Besides that, respondents whose tuition fees are supported by family members might not understand the hardship of earning money and raising money for tuition fees. Not only that, but respondents might also feel that a partial PTPTN loan might help to reduce the burden on their family members. Moreover, respondents do not need to worry about loan repayment as our respondents are all medical students who have not started working life. Given the financial difficulties, the university has developed a new payment policy, which is an installment payment plan. Students are allowed to pay tuition fees in 2 installments. This could help to reduce the burden of raising huge amounts of money at once during this financial distress period.

There is no significant difference in the presence of comorbidities and all domains of quality of life. This could be due to the majority of our respondents (97.4%) do not have comorbidities and hence their lifestyle will not be affected. Even though a minority of our respondents have comorbidities (2.6%), their signs and symptoms could be mild until daily activities are not much affected.

In all QoL domains, dietary preference such as fast food, home-cooked food, and diet negatively predicts a change in the quality-of-life measures. The lack of significant association may be in part due to accessibility of food supply even among students staying in hostels as well as those staying at home. Students were not heavily affected by the COVID-19 pandemic emotionally to the point that they require "comfort food" in our study, hence intake of fast food does not reflect a poorer quality of life as expected. Due to social isolation, all students are mandatorily required to stay in

their homes, hence those students who consume home-cooked food daily become an inevitable choice, which itself does not significantly affect a student's appetite which we predict is a larger influence on the quality of life. However, more robust measures of dietary intake with accurate quantification of meal quantity and its individual serving sizes may be required to properly justify the association between diet and quality of life.

There are no significant differences in the relationship between physical exercise during a pandemic and all domains of quality of life. 40.4% of students do not engage in any form of physical exercise and this group as compared to the group who had at least 15 minutes of exercise, reported no significant increase or decrease in any measures of quality of life. During the COVID-19 crisis, medical students were not affected heavily by mental health conditions such as stress or anxiety due to sheltering and protection by family members and the relatively less demanding and less stressful lifestyle as a student as compared to working adults. Contrary to the most belief that physical exercise is an important driver of mental health and hence improved quality of life, medical students have been well drilled into the kind of lifestyle where physical inactivity was impervious to happiness or improved social functioning unless a particular student has burdens of poor mental health conditions. In addition, physical exercises to boost mood, sleep, and physical health have always tied in closely with the requirements of being disciplined and exercising in a sustained manner, hence many times these conflict with the lifestyle of a medical student. Again, social isolation and physical distancing resulted in perhaps many medical students practicing physical exercises confined only in their own homes, alone without peers, and the ban on the use of public green spaces. All these restrictions very well led to no change in the quality of life despite the level of physical activity.

The empirical results herein should be considered in light of some limitations. The first limitation of this study is having a small sample size, which decreases the representation of the whole medical student population in Malaysia. Second, this study used a cross-sectional study design which cannot provide causal inferences. It is suggested that future studies could carry out a longitudinal study to capture the casual-effect relationship between quality of life and factors that affect the quality of life over a longer time.

Conclusion

In conclusion, the overall quality of life of medical students in UTAR was good with an average mean score above 60 in four domains with the highest mean score of 74.95 in the environment domain during the COVID-19 pandemic. In general, our study found that young students, Year 2 students, students living in a house or apartment, students living with families, students of M40 household income, and students without the presence of congenital disease had a better quality of life and it was statistically significant. On the other hand, gender, race, the current mode of payment for the course, presence of comorbidities, diet preference, and physical exercise during the COVID-19 pandemic did not show any association with quality of life.

Bibliography

1. Abdullah MFIL., *et al.* "Quality of Life of University Students During The COVID-19 Pandemic: Age, History of Medical Illness, Religious Coping, COVID-19 Related Stressors, Psychological Factors, and Social Support Were Predictive of Quality of Life". *Research Square* (2020).
2. "Academic Performance of Pre-Clinical and Clinical Medical Students' of East Coast Malaysian Peninsula: A Cross-Sectional and Descriptive Study That Stimulates Their Life". *Journal of Applied Pharmaceutical Science* (2017).
3. Ackerman CE. "Life Satisfaction Theory and 4 Contributing Factors" (2021).
4. Al Dhaheri AS., *et al.* "Impact of COVID-19 on mental health and quality of life: Is there any effect? A cross-sectional study of the MENA region". *PLOS ONE* 16.3 (2021): e0249107.
5. Algahtani FD., *et al.* "Assessment of the Quality of Life during COVID-19 Pandemic: A Cross-Sectional Survey from the Kingdom of Saudi Arabia". *International Journal of Environmental Research and Public Health* 18.3 (2021): 847
6. Alsubaie MM., *et al.* "The Role of Sources of Social Support on Depression and Quality of Life for University Students". *International Journal of Adolescence and Youth* 24.4 (2019): 484-496.
7. Azzi DV., *et al.* "Quality of life, physical activity and burnout syndrome during online learning period in Brazilian university students during the COVID-19 pandemic: a cluster analysis". *Psychology, Health and Medicine* (2021).

8. Backović DV, *et al.* "Gender Differences in Academic Stress and Burnout among Medical Students in Final Years of Education". *Psychiatria Danubian* 24.2 (2012): 175-181.
9. Better Health Channel. Wellbeing (2020).
10. Bolatov AK, *et al.* "Online-Learning due to COVID-19 Improved Mental Health Among Medical Students". *Medical Science Educator* 31 (2021): 183-192.
11. Chandratre S. "Medical Students and COVID-19: Challenges and Supportive Strategies". *Journal of Medical Education and Curricular Development* 24.7 (2020).
12. Chandratre S., *et al.* "Supporting Medical Student Mental Health during COVID-19: Strategies Implemented for an Accelerated Curriculum Medical Campus". *Journal of Medical Education and Curricular Development* (2021).
13. Chattu VK, *et al.* "An Exploratory Study of Quality of Life and Its Relationship with Academic Performance among Students in Medical and other Health Professions". *Medical Sciences* 8.2 (2020): 23.
14. Chazan ACS, *et al.* "Quality of life of medical students at the State University of Rio de Janeiro (UERJ), measured using Whoqol-brief: a multivariate analysis". *Ciencia and Saude Coletiva* 20.2 (2015): 547-556.
15. Cohut M. "Burnout: Facing the Damage of 'Chronic Workplace Stress'" (2019).
16. Educationmalaysia.gov.my. Fees and costs (2019).
17. Farris M., *et al.* (n.d.).
18. Gallè F, *et al.* "Sedentary Behaviors and Physical Activity of Italian Undergraduate Students during Lockdown at the Time of CoViD-19 Pandemic". *International Journal of Environmental Research and Public Health* 17.17 (2020): 6171.
19. Gan GG and Hue YL. "Anxiety, depression and quality of life of medical students in Malaysia". *The Medical Journal of Malaysia* 74.1 (2019): 57-61.
20. Harcke SJ, *et al.* "G6PD deficiency". *Journal of the American Academy of Physician Assistants* 32.11 (2019): 21-26.
21. Hwang IC, *et al.* "Perceived Social Support as a Determinant of Quality of Life Among Medical Students: 6-Month Follow-up Study". *Academic Psychiatry* 41 (2017): 180-184.
22. Institute of Work and Health. Quality of Life (2021).
23. Kagan J. Quality of Life (2021).
24. Labrague LJ, *et al.* "Social and Emotional Loneliness Among College Students During the COVID-19 Pandemic: The Predictive Role of Coping Behaviors, Social Support, and Personal Resilience". *Perspectives in Psychiatric Care* (2021): 1-7.
25. López-Valenciano A, *et al.* "Impact of COVID-19 Pandemic on University Students' Physical Activity Levels: An Early Systematic Review". *Frontiers in Psychology* 11.624567 (2021).
26. Lyndon MP, *et al.* "Burnout, quality of life, motivation, and academic achievement among medical students: A person-oriented approach". *Perspectives on Medical Education* 6 (2017): 108-114.
27. Meo SA, *et al.* "COVID-19 Pandemic: Impact of Quarantine on Medical Students' Mental Wellbeing and Learning Behaviors". *Pakistan Journal of Medical Sciences* 36 (2020).
28. Ministry of health (MOH). "COVID19 Malaysia" (2021).
29. Nguyen HC, *et al.* "People with Suspected COVID-19 Symptoms Were More Likely Depressed and Had Lower Health-Related Quality of Life: The Potential Benefit of Health Literacy". *Journal of Clinical Medicine* 9.4 (2020): 965.
30. Pagnin D and de Queiroz V. "Influence of Burnout and Sleep Difficulties on the Quality of Life Among Medical Students". SpringerPlus 4.676 (2015).
31. Papapanou M, *et al.* "Medical education challenges and innovations during COVID-19 pandemic". *Postgraduate Medical Journal* (2021).
32. Rebecca. 15 Essential Tips to Improve Your Quality of Life (2020).
33. Ribeiro S, *et al.* "Stress and Quality of Life Among University Students: A Systematic Literature Review". *Health Professions Education* 4.20 (2017): 70-77.
34. Rolak S, *et al.* "Impacts and challenges of United States medical students during the COVID-19 pandemic". *World Journal of Clinical Cases* 8.15 (2020): 3136-3141.
35. Schiffrin EL, *et al.* "Hypertension and COVID-19". *American Journal of Hypertension* 33.5 (2020): 373-374.
36. Study Medicine (MBBS) in Malaysia (n.d.). Study Medicine (MBBS) in Malaysia.

37. Swarbrick M and Yudof J. "Wellness in the 8 Dimensions" (2017).
38. Tang K. "Movement control as an effective measure against Covid-19 spread in Malaysia: an overview". *Journal of Public Health* (Berl.) (2020): 1-4.
39. Tempski P, *et al.* "What do medical students think about their quality of life? A qualitative study". *BMC Medical Education* 12.1 (2012).
40. The WHOQOL Group. "Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment". *Psychological Medicine* 28 (1998): 551-558.
41. University of Oxford. Happy Workers Are 13% More Productive (2019).
42. Wang X., *et al.* "Bidirectional Influence of the COVID-19 Pandemic Lockdowns on Health Behaviors and Quality of Life among Chinese Adults". *International Journal of Environmental Research and Public Health* 15 (2020): 5575.
43. Woolf SH, *et al.* "How Are Income and Wealth Linked to Health and Longevity?" Urban Institute and Virginia Commonwealth University (2015).
44. World Health Organisation. WHOQOL-BREF Introduction, Administration, Scoring and Generic Version of the Assessment (1996).
45. World Health Organization (WHO)a. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2021 (2020).
46. World Health Organization (WHO)b. WHO Coronavirus Disease (COVID-19) Dashboard (2021).
47. Wu C., *et al.* "Risk factors associated with acute respiratory distress syndrome and death in patients with coronavirus disease 2019 pneumonia in Wuhan, China". *JAMA Internal Medicine* (2020).
48. Xie J., *et al.* "Depressive Symptoms, Sleep Quality and Diet During the 2019 Novel Coronavirus Epidemic in China: A Survey of Medical Students". *Frontiers in Public Health* 8.588578 (2021).
49. Yee A., *et al.* "Depression Level and Coping Responses Toward the Movement Control Order and Its Impact on Quality of Life In the Malaysian Community During the COVID-19 Pandemic: A Web-based Cross-sectional Study". *Annals of General Psychiatry* 20.31 (2021).
50. Zis P, *et al.* "Medical Studies during the COVID-19 Pandemic: The Impact of Digital Learning on Medical Students' Burnout and Mental Health". *International Journal of Environmental Research and Public Health* 18.1 (2021): 349.
51. Zhang Y, *et al.* "Quality of Life of Medical Students in China: A Study Using the WHOQOL-BREF". (2012).