


RESEARCH ARTICLE

Quality of life among undergraduate university students during COVID-19 movement control order in Sarawak

Whye Lian Cheah  | Leh Shii Law | Keng Hoong Teh | Su Ling Kam |
Grace Ern Hui Voon | Han Yong Lim | Nuhes Seelan Shashi Kumar

Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak, Kota Samarahan,
Sarawak, Malaysia

Correspondence

Whye Lian Cheah, Faculty of Medicine and
Health Sciences, Universiti Malaysia Sarawak,
94300 Kota Samarahan, Sarawak, Malaysia.
Email: wlcheah@unimas.my

Abstract

Background and Aims: This study aimed to examine the quality of life (QoL) and health satisfaction of undergraduate university students in Sarawak during MCO and its association with socio-demographic profiles.

Methods: In this cross-sectional study, QoL and satisfaction of health of 503 undergraduate university students (63.4% females) from a public university was assessed online using the World Health Organization QoL (WHOQOL)-BREF instrument.

Results: The overall QoL and satisfaction with health were 3.7 ± 0.87 and 3.9 ± 0.82 , respectively. Male students showed significantly lower mean scores for the environmental domains than female students (63.37 ± 16.21 vs 68.10 ± 14.00 , $P < .01$). Students who lived inside the campus (vs outside campus) showed significantly lower mean score for the physical health (61.49 ± 13.94 vs 67.23 ± 13.93 , $P < .01$), environmental health (58.35 ± 15.07 vs 70.49 ± 13.21 , $P < .01$), overall QoL (3.39 ± 0.90 vs 3.84 ± 0.83 , $P < .01$), and satisfaction with health (3.71 ± 0.90 vs 3.97 ± 0.77 , $P < .01$). Students with parent's income below RM5000 (vs parent's income more than RM5000) had significantly lower mean score for the environmental domain (65.06 ± 14.35 vs 68.20 ± 15.74 , $P < .05$). Others ethnicity scored significantly lower than Bumiputera Sarawak and Malay while Bumiputera Sarawak scored significantly lower than Chinese in physical health domain (Malay = 65.73 ± 13.40 , Chinese = 63.24 ± 15.35 , Bumiputra Sarawak = 67.35 ± 13.30 , Others = 60.84 ± 15.88 , $P < .05$). Malay (69.99 ± 15.20) scored significantly higher than other ethnicities (Chinese = 63.58 ± 15.80 ; Bumiputera Malaysia = 65.23 ± 13.66 ; others = 63.98 ± 15.59) in environmental domain ($P < .01$). When comparing between religions, the results also showed there were significant differences between different religion groups in overall QoL (Islam = 3.75 ± 0.93 , Christianity = 3.77 ± 0.79 , Others = 3.34 ± 1.14 , $P < .05$), physical health (Islam = 65.00 ± 13.86 , Buddhism = 68.40 ± 11.99 , Christianity = 64.77 ± 14.94 , Others = 61.00 ± 16.03 , $P < .05$), and environmental health (Islam = 69.66 ± 15.48 , Buddhism = 64.99 ± 11.36 , Christianity = 64.87 ± 15.61 , Others = 62.13 ± 16.28 , $P < .05$).

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2021 The Authors. *Health Science Reports* published by Wiley Periodicals LLC.

Conclusion: By understanding university students' QoL in this global disaster, relevant authorities would provide a better rehabilitation and assistance to those affected ones.

KEYWORDS

COVID-19, movement control order, quality of life, university students, World Health Organization quality of life WHOQOL-BREF

1 | INTRODUCTION

Coronavirus disease (COVID-19), a highly contagious disease, caused traumatic events in the population^{1,2,3} especially due to its devastating effects on the health. Pneumonia like symptoms were observed on the patients including dry cough, dyspnea, fever, and eventually acute respiratory distress syndrome (ARDS) and multiple organ failure.⁴ To control the transmission of the COVID-19 virus, governments all over the world including Malaysia implemented the “Movement Control Order (MCO).” In Malaysia, all mass movements and gathering activities were prohibited and people were advised to do home isolation⁵ beginning from March 18, 2020. As a precedent in the country, every individual was expected to switch their lifestyles by following the new norms that were seemingly distinguishable from that of before the pandemic period and the changes were believed to exert negative effects on quality of life (QoL).⁶ Therefore, this research was planned to understand the implications of these MCO restrictions on the health and QoL of the community.

QoL is a perception consisting of life satisfaction, emotional well-being, and individual functional characteristic. According to the World Health Organization (WHO), QoL is defined as “Individuals” perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.⁷ This definition is consistent with the view that QoL refers to a subjective assessment incorporated in a societal, social, and environmental sense. It is commonly measured in 4 domains: physical, psychological, social, and environment.⁸

A survey carried out by UNESCO (2020) reported about 1.646 million (peaked on April 30, 2020) learners in 163 countries were required to stay at home due to the closure of educational institutions and a high proportion of them were university students. In Malaysia, students at several public universities and private institutes of higher education were ordered to stay on campus and were not allowed to return home during MCO.⁹ Not limiting to such uncertain conditions, the students also needed to confront other undesired issues in academic work and social life, as well as their personal financial situations, and emotional health. These issues included switch to online lessons, lack of face-to-face interaction with their lectures, introduction of new assessment methods, remaining trapped in the hostel, no meetings with friends, worries about their own financial condition, boredom, frustration, and fear.^{10,11} Such experiences could create psychological effects, including symptoms of stress, anxiety, and depression that are associated with low QoL.^{12,13,14} Age, living with

family, income, gender, ethnicity were among contributing factors that were associated with the mental and physical health of the students. In some countries like Russia, China, and Bangladesh, a sharp rise of mental health problems including suicide attempts were observed.^{15,16,17} These information consistently provide evidence that there is a necessity to have a closer observation into the QoL of the university students.

Given these unexpected circumstances, it was of important to have a closer monitor on the mental and physical health experiences of the students as the states were closely related to their QoL. Therefore, this study was planned to obtain deeper understanding on these issues so that institutions of higher education were provided with accurate information to help formulate a more effective strategy and approach in handling the well-being of the students during a pandemic. This study aimed to assess the QoL among undergraduates of Universiti Malaysia Sarawak during MCO and its association with socio-demographic background.

2 | METHODS

It was a cross-sectional study and data collection was carried out from May to June 2020. Participants of the study comprises of students from various academic years and nine different faculties at University Malaysia Sarawak. Universiti Malaysia Sarawak is one of the public universities located in Borneo or more specifically Kota Samarahan, Sarawak. Similar to other universities, it was affected by the MCO as well where many students from Sabah and Peninsular Malaysia, as well as Sarawak itself were stranded in the campus, unable to return to their home. The inclusion criteria were those who were staying either in the campus or outside rented house during the MCO and unable to return to their home.

The data collection was conducted during the movement control order (MCO) of COVID-19 period in Malaysia, using Snowball sampling technique. Due to restriction in the MCO, after the potential respondents were approached, they were further asked to recruit other people to participate in this study. These steps were repeated until the sample size was achieved. The questionnaire was developed using Google Form and the link was shared to students in each faculty using WhatsApp as the medium. Other than that, link of the Google Form was uploaded into social media pages such as Facebook, Twitter, and Telegram. The respondents were briefed on the objectives and purpose of the research before consent was taken. The

respondents were given the option to accept or decline their invitation to join the study.

The instrument used in this study was WHOQOL-BREF [7]. WHOQOL-BREF contains four major domains: physical, psychological, social relationships, and environment. The original instrument composed of 26 items, but question number 21 was removed because it was not applicable for students in a local setting (about sexual activity). The first two items are to assess the general QoL of the students. The remaining questions are classified into four domains: physical health (seven items), psychological (six items), social relationships (two items), and environment (eight items). Each of the item is scaled from one to five in which higher number indicates higher QoL except few questions, where reverse scoring was applied. Another additional component was added into the instrument to obtain the demographic details of the participants (age, gender, ethnicity, religion, parent's income, and place of stay during MCO).

A pilot study of 30 respondents was conducted to determine the reliability of the instruments. The Cronbach's alpha was reported to be 0.824, indicating the instrument was reliable.

Data were analyzed using the IBM Statistical Package for Social Science (SPSS) version 23.0 (SPSS, Inc., Chicago, Illinois). Descriptive statistics for the different domains of WHOQOL-BREF and satisfaction of health were presented in frequency distribution, percentages, mean, and SD. Pearson product moment correlation test was used to find correlation between two continuous variables. Independent samples t-test and one-way ANOVA were applied to compare the mean differences in the WHOQOL-BREF and satisfaction of health between two and more groups. Statistical significance was set as a *P*-value of less than .05.

Ethical approval from obtained from the Universiti Malaysia Sarawak Medical Ethics Committee (UNIMAS/NC-21.02/03-02 Jld.4 (89). An informed consent was posted together with the online questionnaire. Respondents were required to read the research information and provide their consent prior to data collection.

TABLE 1 Socio-demographic profile of respondents (N = 503)

Characteristics		n (%)	Mean (SD)
Age (years old)			21.9 (1.21)
Gender	Male	184 (36.6)	
	Female	319 (63.4)	
Ethnicity	Malay	163 (32.4)	
	Chinese	183 (36.4)	
	Bumiputera Sarawak	102 (20.3)	
	Others	55 (10.9)	
Religion	Islam	183 (36.4)	
	Buddhism	108 (21.5)	
	Christianity	162 (32.2)	
	Others	50 (9.9)	
Parent's income	Below RM5000	294 (58.4)	
	Above RM5000	209 (41.6)	
Place of stay during MCO	Inside campus	171 (34.0)	
	Outside campus	332 (66.0)	

3 | RESULTS

3.1 | Socio-demographic profile of respondents

From Table 1, a total of 503 subjects (mean age = 21.9 ± 1.21 years; female = 63.4%) participated in the study. About one third of the respondents were Chinese (36.4%), followed closely by Malays (32.4). For parent's monthly income, more than half of the students were below RM5000 (58.4%). Higher number of respondents (66.0%) were staying outside campus.

3.2 | WHOQOL-BREF domains and QoL and satisfaction with health items

The WHOQOL-BREF mean score for overall QoL and satisfaction with health were (3.7 ± 0.87) and (3.9 ± 0.82) respectively. The results on the four domains revealed that the social relationship domain has the highest mean score of 69.4 (SD 18.08), while psychological health showed the lowest mean score (59.5 ± 15.90 ; Table 2).

3.3 | Association between socio-demographic profile with WHOQOL-BREF

Table 3 shows the association between socio-demographic profiles with WHOQOL-BREF. Female students showed higher mean scores for physical health compared to the male students, and this difference was found to be significant. In term of ethnicity, only two domains (physical health and environmental health) were found to have a significant difference (Physical health: Malays>Others; Chinese>Bumiputra Sarawak; Bumiputra Sarawak>Others; Environmental Health: Malay>Chinese; Malay>Bumiputra Sarawak; Malay>Others). Under religion, three domains which were reported to a

have significant difference between religion were QoL (Islam>Others; Christianity>Others), Physical Health (Islam>Others; Buddhism>Islam; Buddhism>Christianity; Buddhism>Others), and Environmental health (Islam>Others; Islam>Buddhism, Christianity>Islam). The students

with parent's income above RM5000 demonstrated significant higher mean scores for environment health domains (68.20 ± 15.74 vs 65.06 ± 14.35 , $P < .05^*$).

The students that stayed outside campus obtained higher scores than those who stayed inside campus in two domains, which included physical health (67.23 ± 13.93 vs 61.49 ± 13.94 , $P < .01^*$), and environmental health (70.49 ± 13.21 vs 58.35 ± 15.07 , $P < .01^*$). The overall QoL (3.84 ± 0.83 vs 3.39 ± 0.89 , $P < .01^*$) and satisfaction with health (3.97 ± 0.77 vs 3.71 ± 0.90 , $P < .01^*$) were found to be higher among the students that stayed outside campus compared to those who stayed inside campus with significant differences.

TABLE 2 WHOQOL-BREF domains, QoL, and satisfaction with health items (N = 503)

Domain/item	Mean	SD	Minimum	Maximum
Physical health	65.3	14.18	0	100
Psychological health	59.5	15.90	0	100
Social relationships	69.4	18.08	0	100
Environmental health	66.4	15.00	0	100
Overall QoL	3.7	0.87	1	5
Satisfaction with health	3.9	0.82	1	5

Abbreviation: QoL, quality of life.

4 | DISCUSSION

Based on the results of this study, the highest mean of satisfaction among the four domains of WHOQOL-BREF is for social relationship

TABLE 3 Association between socio-demographic profile with WHOQOL-BREF (N = 503)

		Physical health	Psychological health	Social relationship	Environmental health	Quality of life (QOL)	Health satisfaction
Age ^a		$r = 0.002$	$r = 0.038$	$r = -0.045$	$r = -0.031$	$r = -0.032$	$r = -0.030$
Gender ^b	Male	65.24 (14.46)	58.90 (16.90)	67.73 (17.65)	63.37 (16.21)	3.61 (0.97)	3.83 (0.86)
	Female	65.30 (14.04)	59.81 (15.30)	70.30 (18.29)	68.10 (14.00)	3.73 (0.81)	3.92 (0.80)
		$P = .959$	$P = .537$	$P = .125$	$P < .01^*$	$P = .140$	$P = .270$
Ethnicity ^c	Malay	65.73 (13.40)	59.84 (16.98)	71.01 (16.82)	69.99 (15.20)	3.76 (0.92)	3.97 (0.80)
	Chinese	63.24 (15.35)	58.21 (16.02)	67.28 (18.95)	63.88 (15.80)	3.71 (0.83)	3.78 (0.79)
	Bumiputra Sarawak	67.35 (13.30)	60.34 (13.85)	68.99 (17.82)	65.23 (13.66)	3.69 (0.80)	3.92 (0.77)
	Others	60.84 (15.88)	57.88 (18.66)	69.55 (20.80)	63.98 (15.59)	3.45 (1.03)	3.71 (1.05)
		$P < .05^*$	$P = .611$	$P = .426$	$P < .01^*$	$P = .165$	$P = .109$
Religion ^d	Islam	65.00 (13.86)	59.49 (17.14)	70.77 (17.75)	69.66 (15.48)	3.75 (0.93)	3.95 (0.81)
	Buddhism	68.4 (11.99)	59.84 (13.14)	70.37 (17.56)	64.99 (11.36)	3.62 (0.72)	3.89 (0.72)
	Christianity	64.77 (14.94)	59.95 (15.32)	67.75 (17.27)	64.87 (15.61)	3.77 (0.79)	3.88 (0.81)
	Others	61.00 (16.03)	57.08 (18.49)	67.25 (22.43)	62.13 (16.28)	3.34 (1.14)	3.64 (1.08)
		$P < .05^*$	$P = .722$	$P = .333$	$P < .05^*$	$P < .05^*$	$P = .132$
Parent's income ^b	Below RM5000	65.29 (14.13)	59.29 (15.79)	69.00 (18.38)	65.06 (14.35)	3.65 (0.84)	3.87 (0.82)
	Above RM5000	65.26 (14.29)	59.75 (16.08)	69.86 (17.69)	68.20 (15.74)	3.75 (0.92)	3.90 (0.83)
		$P = .979$	$P = .746$	$P = .603$	$P < .05^*$	$P = .222$	$P = .652$
Place of stay ^b	Inside campus	61.49 (13.94)	58.07 (14.96)	67.84 (17.52)	58.35 (15.07)	3.39 (0.89)	3.71 (0.90)
	Outside campus	67.23 (13.93)	60.20 (16.33)	70.14 (18.34)	70.49 (13.21)	3.84 (0.83)	3.97 (0.77)
		$P < .01^*$	$P = .153$	$P = .176$	$P < .01^*$	$P < .01^*$	$P < .01^*$

Note: r = correlation coefficient.

^aCorrelation: significant at $P < .05$, $P < .01$.

^bIndependent t test.

^cOne way ANOVA: Physical Health: Malay > Others, Chinese < Bumiputera Sarawak, Bumiputera Sarawak > Others Environmental Health: Malay > Chinese, Malay > Bumiputera Sarawak, Malay > Others.

^dOne way ANOVA (Post hoc test): Quality of Life: Islam > Others, Christianity > Others Physical Health: Islam > Others, Buddhism > Islam, Buddhism > Christianity, Buddhism > Others Environmental Health: Islam > Others, Islam > Buddhism, Christianity > Islam.

(69.4 ± 18.08) which reflects good personal relationships and social support. During MCO, social relationship was affected due to the practices of social distancing and social isolation, particularly for those who were unable to return home due to movement restrictions. However, during this crisis, many have turned to technology as a coping tool to engage with friends, family, and community. Unlike previous times, with the advancement of technology, communication was not limited to text and audio call, as all smartphones now support video calls. Besides that, social media platforms that were popping up like mushrooms after rain, helped students to follow activities of the people they care for, as it has become a trend to share such information with friends and families.¹⁸ Students also are utilized digital technologies and social media networks to attend their online classes, submit assignments, and even sat for online examination.¹⁹ Such trends have become integrated in the fabric of young people life.²⁰

However, in term of psychological domain, its score was found to be the lowest compared to the others (59.5 ± 15.9). Long-term isolation or home-confinement may have negative effects on mental health of the students during MCO.²¹ Despite having been able to connect socially with others using technology, some research suggested that long hours of social media engagement may cause increased stress, anxiety, depression, and other adverse mental health issues.²² It is believed that such situations happen due to the lack of balance between time spent in school and for leisure when the students were confined to just one space without any outside movement. In addition, long hours of internet use could lead to addictive behavior that causes improper life style and change of personalities, particularly the young adults.²³ In addition, coronaphobia is linked to the fear of COVID-19, the over concern regarding disease contraction and dying, as well as associated socio-occupational stress. Risk factors of coronaphobia included unending uncertainty, loss of faith in health facilities, need of acquiring new practices and avoidance behaviors, and infodemia.²⁴

Upon exploring factors influencing the students' QoL by domain, we found that gender, ethnicity, religion, parent's income, and place of stay during MCO were significantly associated with the component of WHOQoL-BREF. In gender, the female respondents reported to have significant higher score in Environmental health compared to males. A detailed analysis on the distribution of students by gender and place of stay during MCO showed 68.4% of those who were staying outside the campus were female, which explained why female respondents were reported to have higher score in Environmental health. Staying outside the campus though were confined to the house gave more freedom, and better home environment to the students. For those who were staying in the hostel, such freedom was more restricted. At the same time, as part of movement control, the university administration had decided not to allow students to go out of the campus during MCO including shopping to purchase their necessities. These students were only allowed to move around within their rooms, use the bathroom and toilet in their apartments.²⁵ All their meals and necessities were provided for and sent to their respective floors at a designated time. For those who were staying outside the campus, they were reported to have higher significant scores in Physical health, Environmental health, overall QoL, and Satisfaction

with health. Although these students were not in their own home, the house where they stayed resembled closest to their home environment where they can interact with their housemates, go out together to buy food and essentials within the restricted areas. They even can resume their daily routine at the rented house by cooking on their own, do home workouts, access to online shopping, and food delivery. Such flexibilities were not given to the students who stayed in the campus as the university has closed all the entrances into the campus with tight security.

It is rather obvious that those with higher parent's income would have better score in Environmental health, particularly in the aspect of financial resources. Due to the physical closure of all higher education institutions in Malaysia, the majority of the teaching and learning processes went online, with changes in learning and the unavailability of the infrastructure needed to efficiently study from home. Students with lower socio-economic status might not have proper place to study, no access to stable internet connection, and no regular access to printer. In addition, all the students are unique in term of capabilities, confidence, comfort, frustrations, and confusions during the learning process.²⁶ Some even had financial problems as their parents lost their source of income due to closure of most economic sectors. This affected those from lower income group. The findings were consistent with Patricia Aguilera-Hermida.²⁷ The Malaysian Department of Statistics reported that the unemployment rate was as high 5.3% in May 2020 with 826 100 individuals being unemployed, the highest rate in 27 years.²⁸

In terms of religion, there were significantly higher scores in physical health, environmental health, and overall QoL in one religion over another. In many mental health studies, religion played an important role in boosting positive emotions and helped neutralize negative emotions as it served as both life-enhancing factors as well as a coping resource.²⁹ Research has shown that religious beliefs and practices had improved health status, such as coping with disease, recovery after disease, and more optimistic in addressing disease situation.³⁰ In a pandemic situation like now, many people are turning toward faith in response to the economic, social, and health crisis.³¹ Our respondents were no different. This was evidenced that under the component of psychological health, almost all religion reported the same score, ranging within 59.08 to 59.95. Perhaps the differences in other components such as environmental health could be the accessibility to place of worship and supports given under the religious groups. This requires more exploration.

It is interesting to note that in this study, among the ethnic groups, the Malays reported to have higher scores in Physical health and Environmental Health. These findings are not uncommon. A study carried out in Singapore looking at ethnic differences in QoL in adolescents revealed that Indians showing the highest association between different domains of QoL compared to Malays and Chinese.³² These findings attributed to the fact that Indians are more "psychological attuned" and their level of awareness of the "mind-body relationship" was more pronounced, compared to the Chinese who were more stoic. Moreover, several studies also provided consistent findings regarding the associations.^{33,34} As such, a more comprehensive research should be done in order to understand the

complexity of this psycho-social factors in relation to their perception of QoL.

Like most studies carried out during COVID-19 pandemic, the challenge of this study was to reach more respondents through online platform. Although the questionnaire link was distributed through social media such as Whatsapp to other UNIMAS students, but the response rate was low and the progression was slow. It was also difficult to assess every student since some of the students do not have mobile data or Wifi at home. It might introduce biases as that group of students was more susceptible toward QoL due to their financial incapability. In addition, the study was based on a cross-sectional survey, as such no cause-effect can be derived. Differences in the QoL status before and after COVID-19 was impossible as the related data were not available. Due to our recruitment methods and sample size, we are unable to generalize the results to the entire population of university students in Malaysia. Despite that, the study achieved its objectives by improving our understanding on the issues related to QoL among university students better.

5 | CONCLUSION

The results highlight the importance of socio-demographic background, especially for gender, ethnicity, religion, parent's income, and place of stay during pandemic to alleviate the impact of the COVID-19 pandemic on QoL of the university students. To improve the QoL of the university students, not only does the university need to strengthen the support system through mentoring and counseling, but students should be imparted with better coping mechanisms in dealing with their stress, anxiety, and depression during this pandemic.

FUNDING

No funding was used to support this research and/or the preparation of the manuscript.

CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: Whye Lian Cheah

Data collection: Keng Hoong Teh, Su Ling Kam, Grace Ern Hui Voon, Han Yong Lim, Nuhes Seelan Shashi Kumar

Formal analysis: Whye Lian Cheah, Leh Shii Law

Methodology: Whye Lian Cheah, Keng Hoong Teh, Su Ling Kam, Grace Ern Hui Voon, Han Yong Lim, Nuhes Seelan Shashi Kumar

Writing: Whye Lian Cheah, Leh Shii Law, Keng Hoong Teh, Su Ling Kam, Grace Ern Hui Voon, Han Yong Lim, Nuhes Seelan Shashi Kumar

All authors have read and approved the final version of the manuscript.

Whye Lian Cheah had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

Whye Lian Cheah affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no

important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

TRANSPARENCY STATEMENT

The authors affirm that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Whye Lian Cheah  <https://orcid.org/0000-0001-5963-0881>

REFERENCES

1. Rivera RM, Carballea D. Coronavirus: a trigger for OCD and illness anxiety disorder? *Psychol Trauma: Theory Res Pract Policy*. 2020;12(S1):S66. <https://doi.org/10.1037/tra0000725>
2. Saltzman LY, Hansel TC, Bordnick PS. Loneliness, isolation, and social support factors in post-COVID-19 mental health. *Psychol Trauma Theory Res Pract Policy*. 2020;12(S1):S55-S57. <https://doi.org/10.1037/tra0000703>
3. Mancini AD. Heterogeneous mental health consequences of COVID-19: costs and benefits. *Psychol Trauma Theory Res Pract Policy*. 2020;12(S1):S15-S16. <https://doi.org/10.1037/tra0000894>
4. World Health Organization (WHO). Coronavirus; 2021. https://www.who.int/health-topics/coronavirus#tab=tab_1 (accessed February 12, 2021).
5. Daniel Tang KH. Movement control as an effective measure against Covid-19 spread in Malaysia. An overview. *J Public Health*. 2020;13:1-4. <https://doi.org/10.1007/s10389-020-01316-w>
6. Di Renzo L, Gualtieri P, Pivari F, Soldati L, et al. Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey. *J Transl Med*. 2020;18:229. <https://doi.org/10.1186/s12967-020-02399-5>
7. World Health Organization. *Division of Mental Health and Prevention of Substance Abuse. WHOQOL: Measuring Quality of Life*. Geneva: World Health Organization; 1997 <https://apps.who.int/iris/handle/10665/63482>
8. The WHOQOL Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychol Med*. 1998;28(3):551-558.
9. Education Malaysia Global services. Covid-19 guidelines and advice for international students; 2020. <https://educationmalaysia.gov.my/covid-19-guidelines-and-advice-for-international-students/> (accessed February 13, 2021)
10. Cao W, Fang Z, Hou G, et al. The psychological impact of COVID-19 epidemic on college students in China. *Psychiatry Res*. 2020;287:1-5.
11. Owusu-Fordjour C, Koomsom CK, Hanson D. The impact of COVID-19 on learning – the perspective of the Ghanaian student. *Eur J Educ Stud*. 2020;7:1-14.
12. Wathélet M, Duhem S, Vaiva G, et al. Factors associated with mental health disorders among university students in France confined during the COVID-19 pandemic. *JAMA Netw Open*. 2020;3(10):e2025591. <https://doi.org/10.1001/jamanetworkopen.2020.25591>

13. Islam SMD, Md Bodrul D, Rafid MK, Abidul H. Exploring COVID-19 stress and its factors in Bangladesh: a perception-based study. *Heliyon*. 2020;6(7):e04399.
14. Rogowska AM, Kuśnierz C, Bokszczanin A. Examining anxiety, life satisfaction, general health, stress and coping styles during COVID-19 pandemic in polish sample of university students. *Psychol Res Behav Manag*. 2020;13:797-811. <https://doi.org/10.2147/PRBM.S266511>
15. Gritsenko V, Skugarevsky O, Konstantinov V, et al. COVID 19 fear, stress, anxiety, and substance use among Russian and Belarusian university students. *Int J Ment Heal Addict*. 2020;21:1-7. <https://doi.org/10.1007/s11469-020-00330-z>
16. Xiao C. A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems. *Struct Lett Therapy Psychiatr Investig*. 2020;17:175-176.
17. Mamun MA, Sakib N, Gozal D, Israfil Bhuiyan AKM, et al. The COVID-19 pandemic and serious psychological consequences in Bangladesh: a population-based nationwide study. *J Affect Disord*. 2021;279:462-472.
18. Osterrieder A. The value and use of social media as communication tool in the plant sciences. *Plant Methods*. 2013;9:26. <https://doi.org/10.1186/1746-4811-9-26>
19. Sundarasan S, Chinna K, Kamaludin K, Nurunnabi M, et al. Psychological impact of COVID-19 and lockdown among university students in Malaysia: implications and policy recommendations. *Int J Environ Res Public Health*. 2020;17:6206. <https://doi.org/10.3390/ijerph17176206>
20. Garfin DR, Silver RC, Holman EA. The novel coronavirus (COVID-2019) outbreak: amplification health consequences by media exposure. *Health Psychol*. 2020;39(5):355-357.
21. Brooks SK, Webster RK, Smith LE, Woodland L, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020;395(10227):912-920. <https://www.sciencedirect.com/science/article/pii/S0140673620304608>
22. Haidt J, Allen N. Digital technology under scrutiny. *Nature*. 2020;578:226-227.
23. Ashish K, Choo SL, Sureswaran R, Nibras A. Internet addiction in Malaysia causes and effects. *iBusiness*. 2013;5:72-76.
24. Arora A, Jha AK, Alat P, Das SS. Understanding coronaphobia. *Asian J Psychiatr*. 2020;54:102384. <https://doi.org/10.1016/j.ajp.2020.102384>
25. Farhan Hidayat MAF, Hemaloshinee V. COVID-19 pandemic during 2020 Malaysia control order (MCO) – the case of residential college students' mental health. *Cnr' Int J Social Sci Res*. 2020;6(1):1-17.
26. Dhawan S. Online learning: a panacea in the time of COVID-19 crisis. *J Educ Technol Syst*. 2020;49(1):5-22. <https://doi.org/10.1177/0047239520934018>
27. Patricia AHA. College students' use and acceptance of emergency online learning due to COVID-19. *Int J Educ Res Open*. 2020;1:100011. <https://doi.org/10.1016/j.ijedro.2020.100011>
28. Department of Statistics Malaysia. Key Statistics of labour force in Malaysia; 2020. <https://www.dosm.gov.my/v1/index.ph>
29. Koenig HG. Religion, spirituality, and health: the research and clinical implications. *Int Scholarly Res Notices*. 2012;2012:278730. <https://doi.org/10.5402/2012/278730>
30. Albers G, Echteld MA, de Vet HC, Onwuteaka-Philipsen BD, van der Linden MH, Deliens L. Content and spiritual items of quality of life instruments appropriate for use in palliative care: a review. *J Pain Symptom Manag*. 2010;40:290-300.
31. Kowalczyk O, Roszkowski K, Montane X, Pawliszak W, Tylkowski B, Bajek A. Religion and faith perception in a pandemic of COVID-19. *J Relig Health*. 2020;59:2671-2677. <https://doi.org/10.1007/s10943-020-01088-3>
32. Ng TP, Lim LCC, Jin A, Shinfuku N. Ethnic differences in quality of life in adolescents among Chinese, Malay and Indians in Singapore. *Qual Life Res*. 2005;14:1755-1768.
33. Lim E, Davis J, Siriwardhana C, Aggarwal L, Hixon A, Chen JJ. Racial/ethnic differences in health-related quality of life among Hawaii adult population. *Health Qual Life Outcomes*. 2020;18:380. <https://doi.org/10.1186/s12955-020-01625-4>
34. Wallander JL, Fradkin C, Elliott MN, Cuccaro PM, Tortolero Emery S, Schuster MA. Racial/ethnic disparities in health-related quality of life and health status across pre-, early-, and mid-adolescence: a prospective cohort study. *Qual Life Res Int J Qual Life Asp Treat Care Rehab*. 2019;28(7):1761-1771. <https://doi.org/10.1007/s11136-019-02157-1>

How to cite this article: Cheah WL, Law LS, Teh KH, et al. Quality of life among undergraduate university students during COVID-19 movement control order in Sarawak. *Health Sci Rep*. 2021;4:e362. <https://doi.org/10.1002/hsr2.362>