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ORIGINAL ARTICLE

Perceived Stress Related to Open Distance Learning (ODL) Among Undergraduate University Students in Malaysia.

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Abstract

In response to the coronavirus disease 2019 (COVID-19) crisis, the World Health Organisation (WHO) declared COVID-19 a pandemic on March 11, 2020. This pandemic has affected everyone in many ways and students are among those who suffered the most during the quarantine period. While being socially isolated, students may experience tension, stress, irritation, and discontent. Students are frequently worried and overwhelmed as a result of too many homework submissions, interminable quizzes, conflicting deadlines, and online assessments. A cross-sectional survey was performed using a self-administered anonymous online Perceived Stress Scale (PSS) questionnaire. The questionnaire was distributed to undergraduate university students in Malaysia, and the data was analysed using descriptive statistics and the Chi-square Test. Out of 405 respondents, the perceived level of stress was seen higher among males (46.67%) students studying in IPTA (67.41%), third year (37.78%), and students from the STEM program (51.11%).Most university students in Malaysia had moderate stress levels during open and distance learning (ODL). There was also a significant association between the level of stress in students during ODL and sociodemographic factors such as place of study, gender, and year of study.

Keywords: *COVID-19, open distance learning (ODL), perceived stress scale (PSS), stress.*

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a new coronavirus that first emerged in Wuhan, Hubei Province, China at the end of 2019. It was where the Coronavirus Disease 2019 (COVID-19) was first found and caused symptoms such as severe pneumonia, cough, fever, and in some cases may even lead to death [1]. In January 2020, COVID-19 was declared a public health emergency of international concern and has since become a major challenge in terms of hindering the spread of infection in almost every country around the world [2]. According to Mustafa et al., to control the spread of COVID-19 infection, those who are infected need to undergo self or monitored compulsory quarantine or isolation [1].

From February 27 until March 1, a religious mass gathering was held at Sri Petaling Mosque near Kuala Lumpur which led to a sudden rise in the number of COVID-19 infections in Malaysia. The event was attended by approximately 16,000 people and eventually triggered a new wave of COVID-19 infections across the country and formed a cluster known as "*tabligh* cluster" [3].

Due to the mass gathering, Malaysia had a sudden increase in new COVID-19 cases, with a total of 190 cases recorded on March 15 [4]. Since then, the number of positive cases kept increasing daily which eventually led the Prime Minister of Malaysia to impose a Movement Controlled Order (MCO) on the citizens.[3] New rules were enacted to execute particular procedures during the implementation of MCO. For example, every educational institution, notably schools, colleges, and universities in Malaysia was ordered to close their operation.

Quarantine is a state of voluntary restrictions at home, termination of public gatherings, and travel restrictions [5]. Quarantine is one of the effective ways to protect the public, which includes students from the spread of infection [6]. MCO was imposed by the government on Malaysians to curb the virus when the number of positive cases was seen to increasing trend. From then on, travel restrictions were initiated, and citizens' movement was restricted followed by the closure of all businesses except essential services [7].

Not only that, schools and universities all around the world had to take drastic measures to protect the students and contain the spread of the virus by changing the mode of teaching and learning to virtual means. Initially, face-to-face classes were abolished and replaced with online lectures while most students were at their campus hostels or residencies. The government then allowed students to go back to their hometowns where most higher learning institutions (IPT) started the arrangement to send them back gradually according to their zones following MCO [8]. The replacement of face-to-face teaching courses, with video conferences or live broadcasts, is known more specifically as Open and Distance Learning (ODL) [5].

ODL permits all types of discussion, however, there are still a few obstacles which make it difficult for students to complete a task or even understand what they are learning. They were used to being surrounded by fellow classmates and friends nonetheless, constraints on social life during quarantine can lead to constant worrying and anxiety about their studies and future [9]. Some even felt like they did not gain any knowledge from the online classes which got them doubting their degree or diploma.

Students not only find it hard to focus during online classes, but they also struggle to comprehend what they are learning especially if they had stayed up until late at night to finish their assignments and tasks. According to Aslan & Pekince in 2020, some factors may contribute to anxiety and stress among students such as a lack of knowledge regarding COVID-19 infection rate and feeling overwhelmed by media reports. For example, students may have misunderstandings about the disease due to false information widely being spread through social media [9]. In addition, they may not be aware of special COVID-19 infection control measures that are related to their study environment. This can lead to an increase in the level of stress and anxiety of students while in

ODL, which in turn may negatively affect their judgment and study performance [1].

The previous health crisis also highlighted the psychological effects of quarantine, which contributed to an even higher level of stress while being in a pandemic [10]. The amount of time students spend in front of the computer also seems to have an impact. It should be noted that the effects of long-term exposure to telecommunications can also affect physical and mental health. Watching the screen for a long time and depending on devices is unhealthy. Continued reliance on electronic media among students is associated with fatigue, reduced sleep time, and increased depressive symptoms. Furthermore, this group is at particular risk for high levels of stress. The level of perceived stress and the mental health of students during the pandemic must be monitored and studied [10] and therefore this study is conducted.

Methods

This cross-sectional study was conducted among 405 undergraduate university students in Malaysia. The sample size for this study was calculated by using Raosoft® calculator. The confidence interval was set at 95% with a margin error of 0.05 and a response distribution of 50%. The convenience non-probability sampling technique was used to collect the sample for this study. Participants of this study were selected based on who met all the inclusion criteria; undergraduate students enrolled in Institutes for Public Higher Education (IPTA) and Private Higher Educational Institutions (IPTS) in Malaysia and volunteered to take part in the study. The questionnaire comprised of two different sections. Section A consists of sociodemographic data of the respondents (place of study, gender, programme and year of study). Section B was adapted with minor modifications from the Perceived Stress Scale (PSS) questionnaire, which was the most commonly used psychological instrument to evaluate an individual's level of stress. This scale was developed by Cohen, Kamarck & Mermelstein (1983) [11]. Items were created to reflect how unpredictable and overburdened respondents feel. It consists of ten items, each of which was scored on a 5-point Likert scale ranging from 0 to 4. 0, 1, 2, 3 and 4 respectively denotes never, almost never, sometimes, fairly often, and very often. The PSS-10 score varies from 0 to 40, and the score for questions 4, 5, 7, and 8 was reversed due to the use of negative-type questions. The total score ranged from 0 to 40 marks. A higher score such as above 32 marks suggests a higher level of stress (Roy, 2020) [12]. Scores more than 68% (> 27 marks) were considered severe stress, 35 - 67% (14 to 26 marks) as moderate stress, and less than 34% (<14 marks) were considered minimal stress.[11] The questionnaires were in both English and Malay languages. Prior to data collection, a pilot study was conducted using Cronbach's alpha test on 30 university students from different universities all over Malaysia, chosen at random (Cronbach alpha value is 0.806). Descriptive statistics were performed for the collected data and presented as frequency and percentages. The chi-square test was used to identify the association between sociodemographic profiles with the level of perceived stress during ODL among university students in Malaysia. A P-value of <0.05 was considered statistically significant.

Results

Sociodemographic Profiles

The recommended sample size by Raosoft® for the validity of this study was 383 students. However, the data was collected from a total of 405 university students in Malaysia. Because there was no missing data, no students were excluded from the study. Referring to Table 1, the sociodemographic characteristics of the respondents were categorised based on their gender, university, year of study, and course programme. The majority of the respondents were IPTA students (n=311, 76.8%), followed by IPTS students (n=94, 23.2%).

In addition, the majority of the respondents were from Science, Technology, Engineering, and Mathematics (STEM) (n=247, 61.0%), followed by Accountancy, Business & Management (ABM) (n=74, 18.3%), Humanities and Social Sciences (HumSS) (n=42, 10.4%), Arts & Design (n=25, 6.2%), General Academic Strand (GAS) (n=9, 2.2%), and Technical-Vocational-Livelihood (TVL) (n=8, 2.0%).

Perceived Stress Scale (PSS)

Based on the data collected, the majority of the respondents constantly answered "Sometimes" for all PSS-10 questions, followed by "Fairly Often" and "Often". 51 (12.6%) respondents often have been upset because of something that happened unexpectedly, 61 (15.1%) respondents often felt that they were unable to control the important things in life, 91 (22.5%) respondents often felt nervous and stressed, 56 (13.8%) respondents fairly often have felt confident about their ability to handle their personal problems, and 60 (14.8%) respondents fairly often felt that things were going their way.

Apart from that, 104 (25.7%) respondents often found that they could not cope with all the things that they had to do, 54 (13.3%) respondents fairly often have been able to control irritations in their life, 82 (20.2%) respondents often felt that they were on top of things, 108 (26.7%) respondents fairly often have been angered because of things that happened that were outside of their control, and lastly 71 (17.5%) respondents often felt difficulties were piling up so high that they could not overcome them (Table 2).

Association Between Sociodemographic Profiles and Perceived Stress Level

Based on the results from sociodemographic profiles, the majority of the students have a moderate level of stress. There was also a significant association between three sociodemographic profiles (university, gender, and year of study) with perceived stress levels among undergraduate university students (Table 3).

This study found majority of the IPTA students reported a moderate level of stress (n=273, 67.41%), followed by 37 (9.14%) with severe levels of stress and 1 (0.25%) with a minimal level of stress. This result is found to be similar among IPS students with the majority of them reported to have a moderate level of stress (n=70, 17.8%), followed by a severe level of stress (n=23, 5.68%) and 1 (0.25%) with a minimal level of stress. The p-value of university sociodemographics was found to be significant ($p = 0.007$). When comparing gender, both males and females reported the majority of the groups had moderate levels of stress (46.67% for males; 38.02% for females), followed by severe levels of stress (4.20% for males; 10.62% for females) and the least with minimal level of stress (0.25% for both males and females). The p-value for gender sociodemographics was also found to be statistically significant ($p = 0.001$). Meanwhile, for the difference in the year of study, year 3 students (n=42, 10.37%) were shown to have the highest number of students with a severe level of stress and the p-value was also found to be statistically significant ($p = 0.002$). Based on course sociodemographics, the result showed that students in STEM courses have the highest level of severe stress (n=39, 9.63%) compared to students from other courses. However, the p-value of this course sociodemographic is not statistically significant ($p = 0.927$) since $p > 0.005$ (Table 3).

Thus, three sociodemographic factors which are university, gender, and year of study are shown to have an association with the perceived level of stress in students. Results from this study have also found that there is no association between the sociodemographic factors of courses studied in university with the perceived stress level among undergraduate students.

Discussion

This study has found that the majority of Malaysian undergraduate university students had moderate levels of stress while undergoing ODL

during the pandemic (Table 4). Results from this study are consistent with a prior study conducted by AlAteeq et al,[12,13] in which it was found that the majority of their students experienced moderate level of stress (55%), followed by a high level of stress (30.2%) in virtual classrooms during the outbreak of COVID-19. Another study done by Mustafa et al. [1] among students in Jordan also concluded that the majority of the participants expressed moderate and justifiable levels of stress during the COVID-19 pandemic. Results from the study were expected given that the students' stress level was rather higher at the start of the pandemic. This can be due to the lack of practical classes and hands-on activities for the students and having to constantly rely on virtual aids for understanding. It is also known that online learning environments are challenging for some students and could contribute to loss of social support, enhance social isolation, and stress perception in this population which eventually leads to higher levels of stress. Jordan then implemented significant precautionary steps against the pandemic over time. As a result, the stress level among Jordanian students was reduced.

Gender was also reported to be one of the main determinants of perceived stress in our study. This study showed a higher number of female students were reported to have severe stress levels compared to male students. This is aligned with a study done by Cheema et al. in 2021, [14] in which female students had a significantly higher stress level than male students. From the study, female students made up 62% of the total respondents and had twice the risk of stress than male students. Moreover, Cohen's original study in 1983,[11] as well as subsequent studies from the non-Eastern Mediterranean Region (EMR) states have found that females had greater levels of stress than males [14]. Two studies conducted among dentistry students in EMR states also found that females had higher levels of stress than males [14]. According to previous studies, women tend to show more pathologies related to mood disorders such as anxiety disorders and depression. However, in men, they tend to opt for interaction with the environment such as the use of substance use [15].

Moreover, there was a significant association between the year of study and the level of stress related to ODL among undergraduate students (p-value 0.002). It was seen that overall, most students (Year 1 until Year 5) experienced moderate levels of stress. However, quite a number of students (n=42, 10.37%) from Year 3 was reported to experience severe stress level during ODL, followed by 12 (2.96%) Year 2 students and 5 (1.23%) Year 1 students. Meanwhile, there was 0 (0%) students from Year 4 reported experiencing severe stress and only 1 (0.25%) student in Year 5 reported having severe stress during ODL. Year 3 of study is usually accompanied by final year projects or practical exams in which students are expected to produce reports and have to be physically present at the university. However, due to the pandemic, some of these may need to be exchanged to an online mode which may be a nuisance in the case of students who are not equipped with a stable internet connection at home.

However, the findings obtained from this study were not in line with the results from a study conducted by Abdulghani et al. in 2020 [16]. Findings from that study showed that the level of stress among university students during the pandemic was mostly only at a minimal level. The majority of their students experienced minimal stress and only 5 (9.6%), 3 (4.7%), 19 (46.3%), 4 (7.7%) and 0 (0%) students from Years 1, 2, 3, 4, and 5 respectively experienced severe levels of stress while undergoing ODL during the pandemic. The findings in this study were also not aligned with a previous study, which posited that students in their early year of study encounter greater levels of stress when compared to their peers in subsequent years of their academic program. It was reported that the first year students were 2.383 times more likely to be stressed than the fourth year students [17].

Conflict of Interest

The authors declare no conflict of interest.

Table 1. Sociodemographic profiles of the respondents (n=405)

Characteristics	Demographic characteristics	Frequency (N)	Percentage (%)
University	IPTA[1]	311	76.8
	IPTS[2]	94	23.2
Gender	Male	207	51.1
	Female	198	48.9
Course/Programme	STEM[3]	247	60.9
	ABM[4]	74	18.3
	HumSS[5]	42	10.4
	GAS[6]	9	2.2
	TVL[7]	8	2.0
	Arts & Design	25	6.2
Year of Study	1	100	24.7
	2	69	17.0
	3	196	48.4
	4	29	7.2
	5	11	2.7

[1]IPTA Public Higher Education
[2]IPTS Private Higher Educational Institutions
[3]STEM Science, Technology, Engineering, and Mathematics
[4]ABM Accountancy, Business & Management
[5]HumSS Humanities and Social Sciences
[6]GAS General Academic Strand
[7]TVL Technical-Vocational-Livelihood

Table 2. Responses to PSS-10 Questions (N = 405)

No.	Perceived Stress Scale	Never, N (%)	Almost Never, N (%)	Sometimes, N (%)	Fairly Often, N (%)	Often, N (%)
1.	During ODL, how often have you been upset because of something that happened unexpectedly?	5 (1.2)	20 (4.9)	228 (56.3)	101 (24.9)	51 (12.6)
2.	During ODL, how often have you felt that you were unable to control the important things in your life?	7 (1.7)	40 (9.9)	192 (47.4)	105 (25.9)	61 (15.1)
3.	During ODL, how often have you felt nervous and stressed?	4 (1.0)	37 (9.1)	162 (40.0)	111 (27.4)	91 (22.5)
4.	During ODL, how often have you felt confident about your ability to handle your personal problems?	33 (8.1)	94 (23.2)	208 (51.4)	56 (13.8)	14 (3.5)
5.	During ODL, how often have you felt that things were going your way?	26 (6.4)	95 (23.2)	213 (52.6)	60 (14.8)	11 (2.7)
6.	During ODL, how often have you found that you could not cope with all the things that you had to do?	4 (1.0)	58 (14.3)	183 (45.2)	56 (13.8)	104 (25.7)
7.	During ODL, how often have you been able to control irritations in your life?	28 (6.9)	85 (21.0)	226 (55.8)	54 (13.3)	12 (3.0)
8.	During ODL, how often have you felt that you were on top of things?	26 (6.4)	66 (16.3%)	208 (51.4)	82 (20.2)	23 (5.7)
9.	During ODL, how often have you been angered because of things that happened that were outside of your control?	9 (2.2)	61 (15.1)	160 (39.5)	108 (26.7)	67 (16.5)
10.	During ODL, how often have you felt difficulties were piling up so high that you could not overcome them?	8 (2.0)	54 (13.3)	178 (44.0)	94 (23.2)	71 (17.5)

Table 3. Association between Sociodemographic Profiles and Level of Stress

Sociodemographic	Minimal Stress, N (%)	Moderate Stress, N (%)	Severe Stress, N (%)	Chi-Square
University				
IPTA[1]	1 (0.25)	273 (67.41)	37 (9.14)	0.007
IPTS[2]	1 (0.25)	70 (17.28)	23 (5.68)	
Gender				
Male	1 (0.25)	189 (46.67)	17 (4.20)	0.001
Female	1 (0.25)	154 (38.02)	43 (10.62)	
Year of Study				
Year 1	0 (0.00)	95 (23.46)	5 (1.23)	0.002
Year 2	0 (0.00)	57 (14.07)	12 (2.96)	
Year 3	1 (0.25)	153 (37.78)	42 (10.37)	
Year 4	1 (0.25)	28 (6.91)	0 (0.00)	
Year 5	0 (0.00)	10 (2.47)	1 (0.25)	
Course/Program				
STEM[3]	1 (0.25)	207 (51.11)	39 (9.63)	0.927
ABM[4]	1 (0.25)	62 (15.31)	11 (2.72)	
HumSS[5]	0 (0.00)	39 (9.63)	3 (0.74)	
GAS[6]	0 (0.00)	8 (1.98)	1 (0.25)	
TVL[7]	0 (0.00)	7 (1.73)	1 (0.25)	
Arts & Design	0 (0.00)	20 (4.94)	5 (1.23)	

[1]IPTA Public Higher Education
[2]IPTS Private Higher Educational Institutions
[3]STEM Science, Technology, Engineering, and Mathematics
[4]ABM Accountancy, Business & Management
[5]HumSS Humanities and Social Sciences
[6]GAS General Academic Strand
[7]TVL Technical-Vocational-Livelihood

Table 4. Perceived Stress Scale of Respondents (N=405)

No.	**Level**	**N (%)**	**Total Score Mean (SD)**
1.	High	111 (27.4)	6.99 (2.071)
2.	Moderate	213 (52.6)	
3.	Low	81 (20.0)	

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