Enhanced Knowledge in Sciences and Technology Vol. 3 No. 1 (2023) 177-184

EKST

Homepage: http://publisher.uthm.edu.my/periodicals/index.php/ekst
e-ISSN : 2773-6385

Psychological Impact from Covid-19 Among UTHM Students

Andi Nurizzah Mohamad[1], Norziha Che Him[2*]

[1] Port of Tanjung Pelepas, Blok A, Wisma PTP, Jalan Pelabuhan Tanjung Pelepas, TST 507, 81560 Gelang Patah, Johor, MALAYSIA

[2] Department of Mathematics and Statistics,
Faculty of Applied Sciences and Technology,
Universiti Tun Hussein Onn Malaysia (Pagoh Campus),
84600 Pagoh, Muar, Johor, MALAYSIA.

*Corresponding Author Designation

DOI: https://doi.org/10.30880/ekst.2023.03.01.021
Received 15 January 2023; Accepted 11 April 2023; Available online 3 August 2023

Abstract: Covid-19 cases keep increase with people across the world are at risk of dying from that infectious disease. The virus shows rapid spread, strict isolation requirements, and delay in starting schools and universities throughout the country will have an effect on the psychology of students in the university. The objective of this study are; 1) to determine the variety of psychological effects of Covid-19 among UTHM students; 2) to analyse expected feelings that can impact psychology students during Covid-19; and 3) to identify the most preferences activities during the Covid-19 pandemic among university students by using Logistic Regression method. A Cross-tabulation technique has been used to determine psychological effects and the category that psychological effects during Covid-19. In addition, Chi-square adopted to analyse an expected feeling that can impact psychology students during the pandemic, and a Logistic regression applied to predict which is the most preferred activities students had during Covid-19. A total of the respondents is 121 were selected via convenience sampling with a Cronbach alpha value of pilot test is 0.7. This study admit that Covid-19 has a variety of psychological effects on university students. The study analysed expected feelings that may not impact the psychological well-being of students during the Covid-19 pandemic using the chi-square method. This leads to the conclusion that feelings do not impact the psychological well-being of students during the Covid-19 pandemic. Most preferences activities during the Covid-19 pandemic among university students successful identified and prediction variables in these objectives are dependent on the Age, Gender, Year of Study, and Health condition but significant variables are Gender and Health condition, significant variable when the value is less than 0.1. Overall, future research on the psychological impact of university life on students will aim to better understand the challenges and opportunities faced by students and develop effective strategies to support their well-being and academic success.

Corresponding author: norziha@uthm.edu.my

Keywords: Psychological Effect, Covid-19, Confusion Matrix, Logistic Regression, Chi-Square

1 Introduction

SARS-CoV-2, originally known as 2019-nCoV, is a novel coronavirus that is responsible for the illness known as Coronavirus Disease 2019 (Covid-19). It was first identified in Wuhan City, Hubei Province, China, during an outbreak of respiratory illness patients. A group of closely related viruses known as coronaviruses infects both mammals and birds. Human respiratory tract infections brought on by coronaviruses can range from mild to deadly [1]. Due of the Covid-19, all the students need to do classes online for two years. Universities were forced to close due to Covid-19. University student needs to stay at home and took lectures and examination online. Assignments and submissions are online on the university's website. College students are subject to mental health difficulties that give them great anguish even before the Covid-19, and early adulthood is one of the most vulnerable times for many mental diseases [2]. During the Covid-19, young adults and college students confronted more mental challenges, such as academic strain, employment pressure, and family pressure. Numerous studies have linked Covid-19 to major mental and behavioural changes in college students [3].

The current study focused on exploring the psychological impact of the Covid-19 outbreak on university students and participants' expectations of mental health professionals. Semi-structured interviews were conducted with 80 university students aged 18 to 33 years from 19 cities in Turkey. Participants also indicated that they perceived positive situations, such as the value of nature and humanity, and the importance of family, as well as various negative situations, such as mental exhaustion. Finally, participants emphasized that they had different expectations for psychosocial support from mental health professionals and individual activity plans [10].

The necessity for an evaluation of Covid-19's psychological effects is another problem with impact profiles, which may have diminished their utility. neglected to address substance misuse, which is thought to be a viral side effect and is known to be underreported in anxious people [4]. College students may employ these negative coping mechanisms more frequently. Alternative, unmeasured (or better measured), qualities could be utilised to predict students' psychological risk because our predictors only fully explained the variance in the profiles. This study may be able to improve our single-item evaluations of leisure time activities, for instance, by conducting a more thorough analysis of time budgets, like those used in episodic time use surveys [5].

The research objective of this study is to the determined variety of psychological effects during Covid-19 among student universities and analyse expected feelings that can impact psychological students during Covid-19. In addition, this study also identified the most preferred activities during Covid-19 pandemic among university students.

2 Materials and Methods

2.1 Data Collection

This study is in the Universiti Tun Hussein Onn Malaysia which involves all students from all faculties. All the questionnaires' part uses close-ended questions except for Part E. This research considered two methods in data analysis which are chi-square analysis and logistic regression. This research is expected to bring benefits to the students who were struggling with their feelings about the pandemic. The result of this study may spread awareness to other people about the psychological impact on students at university. Hence, the university can increase its action to help the student in need.

This study was collected using the survey form using a convenience sampling method with a total of 121 respondents distributed through social media which is WhatsApp. This study chooses convenience sampling, a nonprobability sampling strategy. Non-probability sampling approaches are

less objective than probability methods because they cannot ensure that every member of a target population will take part in a study [13]. In the questionnaire, there are both closed-ended and open-ended questions. For the closed-ended questions, the responders must select from a predetermined list of options. The survey is divided into five parts, namely Parts A, B, C, D, and E. There are a total of 12 questions in Part A, all of which are about the data's demographics. Part B covers the psychological impacts of Covid-19 among university students, and there are a total of 8 items. Next, Part C discusses the expected psychological effects of the pandemic on pupils, and Part D discusses the most preferred Covid-19 exercises, with a total of 9 and 8 questions respectively. The pilot study had been done with 30 respondents and the value for Cronbach alpha is 0.7.

2.2 Chi-Square Analysis

In this study, Chi-square Analysis were used to analyse the expected feeling that can impact psychology student during Covid-19. The advantage of employing Pearson's Chi-square distribution is that statisticians can analyse data without regard to the normal distribution and still interpret the results. The importance of the Chi-square value is determined using a Chi-square table and the appropriate level of freedom and significance [6]. The Chi-square test is used to assess how closely the observed data distribution resembles the anticipated distribution and to establish whether there is a link between two or more groups, populations, or criteria. The chi-square test is used to check for correlations between commonly used non-numerical variables in statistical research [7]. The chi-square statistic compares the observed values to the expected values Karl Pearson created the chi-square statistical test in 1904 to address substantial discrepancies in contingency tables. A contingency table is a means to arrange count data so that one qualitative variable's frequency distribution is tabulated alongside another qualitative variable's frequency distribution. Cells hold the integer counts of occurrences of that particular state (row, column) of the two variables [11]. The Chi-square has several benefits, such as being robust to data distribution, being simple to compute, providing thorough information, being used in research when parametric assumptions cannot be met, and being flexible enough to handle data from both two-group and multiple-group investigations [14]. The test statistic is used to determine whether the difference between the observed and expected values is statistically significant as shown in Eq. 1;

$$\sum x_{i-j}^2 = \frac{(0-E)^2}{E} \qquad \textit{Eq. 1}$$

where:

O = Observed (the actual count of cases in each cell of the table).
E = Expected value.
χ^2 = The cell Chi-square value.
$\sum \chi^2$ = Formula instruction to sum all the cell Chi-square values.

2.3 Logistic Regression Analysis and Confusion Matrix

Logistic regressions were used in this study to identify the most preferred activities during Covid-19 pandemic among UTHM students. One of the most widely used estimating prediction methods is logistic regression, which provides an estimation range of 0 to 1. It is a statistical analysis technique used to explain the link between two or more independent variables and dependent variables (pass = 1 and fail = 0). The binary logistic regression approach served as both a quantitative analytical tool and a strategy for problem-solving. As a simple statistical model for complex and messy data, binary logistic regression is used to model the binary variable (0, 1) based on one or more predictor factors [8]. Scikit-learn supports multiclass classification tasks with a highly optimised version of logistic regression implementation [15]. The multiple binary logistic regression is shown in Eq. 2;

$$\pi = \frac{\exp(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i)}{1 + \exp(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_i X_i)} \quad \textit{Eq. 2}$$

where:

$\pi(x) =$ logistic regression.
$\beta_0 =$ intercept.
$\beta_i =$ coefficient regression.
$X_i =$ independent variable.

In this study, a confusion matrix has been used to calculate the accuracy of prediction by using a confusion table. A confusion matrix is a tool that clearly and concisely demonstrates how well the classifier performs. It also has the advantage of making the conclusions easy to understand. A confusion matrix can be used to evaluate the performance of any models or algorithms too. The confusion matrix's rows represent the values of the predictive class, and its columns represent the values of the actual class. In addition, every cell shows a possible match between a prediction and reality [9]. Table 1 shows the confusion table.

Table 1: Confusion table

		Prediction	
		0	1
Actual	0	True positive	False negative
	1	False positive	True negative

3 Results and Discussion

3.1 Demography analysis

Table 2 shows the demographic analysis for this study, female shows the highest percentage compared to the male which is 63.6% and 36.3% respectively. Malay respondents contribute the highest with 75.2% compared to other races while the lowest in Bidayuh is 0.8%. The highest age of respondents is 21-23 years old with 72.7% while the lowest age is > 27 years which is only 4%. In this study,89.2% are based on education level Bachelor of Degree and faculty FAST is the highest with 63.6%. Most of the respondents are in the fourth year which is 61.9% and only 3.3% are in the first year.

Table 2: Frequency of Demography

Demography	Category	Frequency
Gender	Female	77
	Male	44
Race	Bidayuh	1
	Chinese	23
	Indian	6
	Malay	91
Age	> 27 years	5
	18 - 20 years	7
	21 -23 years	88
	24 - 26 years	21

Education level	Bachelor of Degree	108
	Diploma	6
	Doctor of Philosophy	1
	Master of Degree	6
Faculty	FAST	77
	FKAAB	5
	FKMP	1
	FPTP	2
	FPTV	7

	FSKTM	4
	FTK	20
	PPD	5
Year of Study	1	4
	2	17
	3	25
	4	75

3.2 Objective 1: Result of determining the variety of psychological effects

According to Table 3, the respondent who answered yes can conclude that their psychology is affected by Covid-19. Female respondents are more likely to have psychological effects during Covid-19 compared to males and the highest psychological effect is less motivation also fatigue which 79.2% and 67.5% based on gender. Malay students are more had psychology affected during Covid-19 compared to other races and feel less motivation and negative emotions more contributed in the race with a percentage of 76.9% and 74.7% respectively. Most of the respondents on age 21-23 years old are psychologically affected. Experienced close contact with relatives or friends, less motivation, and negative are the most contribute to the age with percentages 77%, 74.1%, and 69%. In this study, faculty FAST is more psychologically affected than others faculty.

Table 3: Psychological Effect Of Covid-19 Among UTHM Students (Responds YES)

	Gender	Race	Age	Faculty
Q1b. Did you experience any close contact with a relative or friend during the Covid-19 pandemic?	Female (58)	Malay (66)	21-23years old (67)	FAST (59)
Q2b. Did you feel less motivated during the Covid-19 pandemic?	Female (61)	Malay (70)	21-23years old (65)	FAST (55)
Q3b. Did you have negative emotions during the Covid-19 pandemic?	Female (55)	Malay (68)	21-23years old (60)	FAST (53)
Q4b. Do you feel hopeless during the pandemic?	Female (46)	Malay (58)	21-23years old (48)	FAST (42)
Q5b. Do you feel fatigued during the pandemic?	Female (52)	Malay (67)	21-23years old (59)	FAST (49)
Q6b. Did you feel alone during Covid-19?	Female (32)	Malay (44)	21-23years old (37)	FAST (32)
Q7b. Did you experience any depression during the Covid-19 pandemic?	Female (34)	Malay (43)	21-23years old (40)	FAST (33)
Q8b. How was your overall mental health during covid-19 pandemic?	Female (52)	Malay (59)	21-23years old (58)	FAST (48)

3.3 Objective 2: Expected Feelings That Can Impact Psychological Students During Covid-19

Based on Table 4, *p*-values for expected feelings are more than 0.05. it can be concluded that during the Covid-19 UTHM students were not affected by the psychological impact. During the Covid-19, UTHM students are not worried about the Covid-19 situation and not feeling sad when thinking about Covid-19. In addition, UTHM students did not feel a lack of motivation during Covid-19 and they do not feel paranoid when they have close contact with Covid-19 patients. Hence, respondents are hard to adapt to life changes and do not feel very inconvenienced during Covid-19. All respondents in this study do not feel stressed and irritable when thinking about Covid-19. Lastly, student in UTHM did not feel less productive due to the limited movement during Covid-19.

Table 4: Chi-Square Test For Expected Feelings That Can Impact Psychological Students During Covid-19

Expected feelings	Calculated Chi-Square	*p*-value
Worry	3.0453	0.3847
Sad	0.7371	0.8644
Lack of motivation	0.8991	0.8256
Paranoid	7.7351	0.0518
Adapting life to Covid-19	6.1516	0.1045
Inconvenience	4.9882	0.1727
Stressed	2.5160	0.4724
Irritable	0.8575	0.8357
Less productive	0.1096	0.9907

3.4 Objective 3: Most Preferred Activities Among Students During Covid-19

The early estimated logistic model equation as shown in Table 5 with five iterations produces Eq. 3 and Eq. 4.

$$\text{logit}[\pi(x)] = \log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \alpha + \beta X \qquad \textit{Eq. 3}$$

$$\text{logit}[\pi(x)] = 0.148 - 0.702\,\text{Age} - 1.207\,\text{Gender} - 0.645\,\text{Health Condition} + 0.037\,\text{Year of Study} \qquad \textit{Eq. 4}$$

Overall, this study concluded that the preferred main activities during the pandemic are Age, Gender, Health Condition and Year of Study.

Table 5: Coefficient Estimate, Standard Error and *p*-values

	Coefficient Estimate	S.E	df	*p*-value
Intercept	0.1482	1.50573	1	< 0.10
Age	-0.7024	0.55656	1	< 0.05
Gender	-1.2071	0.58655	1	< 0.05
Health condition	-0.6452	0.39129	1	< 0.05
Year of Study	0.0371	0.34911	1	< 0.10

Table 6: Accuracy Table

		Prediction	
		Indoor activities	Outdoor activities
Actual	Indoor activities	79	27
	Outdoor activities	11	4

Table 7: Confusion Table Compare To Table 6

		Prediction	
		0	1
Actual	0	True positive	False negative
	1	False positive	True negative

Table 6 shows the preferences for indoor and outdoor activities during the Covid-19 pandemic. 79 respondents preferred indoor activities while four respondents preferred outdoor activities. When predicted to prefer outdoor activities, 11 respondents preferred indoor instead. However, 27 respondents preferred indoor activities instead of outdoor activities, when predicted to prefer outdoor activities.

Table 8: Result Evaluation the Confusion Table

False Positive Rate (Fpr)	0.730
False Negative Rate (Fnr)	0.250
Sensitivity	0.745
Specify	0.048
Accuracy	0.690

Based on Table 8, shows the sensitivity is 0.73 which is the mean percentage of individual true positive predicted would default with 74% and the specificity value is 0.048 which is the percentage of individuals model true negative correctly predicted would not default with 4.8%. Around 73% are incorrectly predicted based on the outcome model in the false positive class while 25% are incorrectly predicted based on the outcome in the false negative class. Overall prediction accuracy in this model is 0.69 with 69%.

4 Conclusion

Overall, the first objective shows that UTHM students are affected by Covid-19 with various types of psychological effects towards them. Females are more likely to get a variety of psychological impacts because the frequency of females is more than males. In addition, Females, Malay, FAST with 21-23 years old are psychology affected. The second objective is the expected feeling that can impact psychological students during Covid-19, based on the result of objective 2 UTHM students are not affected by psychological impact during Covid-19. Lastly, the third objective is preferences activities during the Covid-19 pandemic among universities and most of them choose indoor activities during Covid-19. Conclude that, female is more have a variety of psychological effects than males and students are also got the impact of psychology during Covid-19. Significant variable for most preference activities is Gender and Health condition. Lastly, during the pandemic students are more likely to prefer indoor activities to outdoor activities.

Acknowledgment

The authors would like to acknowledge the reviewers for their beautiful remarks and comments on this paper. Also, thank you to the Faculty of Applied Sciences and Technology, Universiti Tun Hussein Onn Malaysia for its support.

References

[1] [Lin, S., Kantor, R. & Clark, E. (2021). Coronavirus Disease 2019. Clinics in Geriatric Medicine, 37, 509–522.

[2] da Silva, M. L., Rocha, R. S. B., Buheji, M., Jahrami, H. & Cunha, K. da C. (2021). A systematic review of the prevalence of anxiety symptoms during coronavirus epidemics. Journal of Health Psychology, 26(1), 115–125

[3] Zhang, Y., Zhang, H., Ma, X., & Di, Q. (2020). Mental health problems during the COVID-19 pandemic and the mitigation effects of exercise: A longitudinal study of college students in China

[4] Roopa, S. & Rani, M. (2012). Questionnaire Designing for a Survey. The Journal of Indian Orthodontic Society, 46, 273–277.

[5] Shedriko, S. (2021). Binary Logistic Regression in Determining Affecting Factors Student Graduation in a Subject. Jurnal Teknologi Dan Open Source, 4, 114–120.

[6] Stratton, S. J. (2021). Population Research: Convenience Sampling Strategies. Prehospital and Disaster Medicine, 36, 373–374.

[7] Turhan, N. S. (2020). Karl Pearson Chi-Square Tests. 15, 575–580.

[8] Shedriko, S. (2021). Binary Logistic Regression in Determining Affecting Factors Student Graduation in a Subject. Jurnal Teknologi Dan Open Source, 4, 114–120.

[9] Zeng, G. (2020). On the confusion matrix in credit scoring and its analytical properties. Communications in Statistics - Theory and Methods, 49(9), 2080–2093.

[10] KAYA, M. S., & KOŞAN, Y. (2021). The Psychological Impact of Covid-19 on University Students: Their Expectations of Mental Health Professionals.

[11] Turhan, N. S. (2020). Karl Pearson ' s chi -square tests. 15, 575–580.

[12] Stratton, S. J. (2021). Population Research: Convenience Sampling Strategies.Prehospital and Disaster Medicine

[13] Mchugh, M. L. (2013). The Chi-square test of independence Lessons in biostatistics.

[14] Stratton, S. J. (2021). Population Research: Convenience Sampling Strategies.

[15] Vogt, W. (2015). Logistic Regression Analysis. Dictionary of Statistics & Methodology.