

Gauging Students' Emotional State amidst Open and Distance Learning (ODL) Mode

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Abstract: The outbreak of the COVID-19 pandemic worldwide has led Universiti Teknologi MARA (UiTM) management to move all classes for its campuses nationwide to an Open and Distance Learning (ODL) mode starting April 2020. Since then, the shift has brought mixed feelings of distress and uneasiness, and symptoms of mental distress can be seen among students through comments and status updates shared on various social networking sites. The researchers found it significant to investigate students' emotional states during ODL mode by measuring their scores on depression, anxiety and stress levels using the DASS-21 questionnaire, as well as to identify the effects of anxiety and stress levels towards depression among the respondents. Primary data was employed involving 848 UiTM Cawangan Pahang students whereby descriptive statistics and structural equation modelling were used to analyze the data. The findings indicated that there existed positive significant effects of stress and anxiety towards depression ($\beta_1 = .704$, p -value < 0.001 ; $\beta_2 = .113$, p -value < 0.01) with 62% total variation explained. The stress factor contributed more effects towards depression compared to the anxiety factor. The findings are aimed at providing new knowledge and discoveries on the issues related to student's mental health, as well as to offer some insights on how the university's relevant authorities could assist the students in dealing with the problems.

Keywords: DASS-21, Open and Distance Learning, Structural Equation Modelling

Introduction

Mental health is a state of being in good health, where individuals manage to acknowledge their capacity to adapt with the usual demands of career and life efficiently (World Health Organization, 2017). Farhan (2020) stated that 8–11% of students will experience depression, 23% will experience extreme anxiety and 5–6% of students will experience extreme stress. Then, when the top management

of Universiti Teknologi MARA (UiTM) decided to move all classes for its campuses nationwide to an Open and Distance Learning (ODL) mode starting April 2020 due to the outbreak of the COVID-19 pandemic which affected Malaysia (Abu Karim, 2020), the changes in the teaching and learning mode had led students feeling stressful and anxious. Their feelings were shared on various social networking sites and that included a few viral tweets about students' mental states due to the stress of dealing with the challenges of ODL (Haziq, 2020).

Previous research has shown that students at higher education institutions faced significant educational and psychosocial pressure during their studies, which made the educational process difficult for them (Manpreet & Maheshwari, 2015). Furthermore, students faced higher levels of depression, anxiety and stress caused by the closing down of educational institutions (Vidyadhara et al., 2020). Thus, as suggested by Wang et al. (2020), the cognitive effects caused by this pandemic should be examined in developing strategies to reduce symptoms during the crisis and truly comprehend the variables involved; stress, anxiety, and depression levels.

Hence, using the DASS-21 questionnaire to gauge the students' stress, anxiety, and depression scores, the research aims to explore the psychological symptoms and emotional states of UiTM Cawangan Pahang students during their ODL sessions. This study also aims to determine the significance of respondents' stress and anxiety levels in relation to depression. Even if the pandemic phase has now transitioned into an endemic stage, between December 10 and December 16, 2023, Malaysia had 20,696 cases of COVID-19, a 62.2% rise, though the Health Minister declared that there is no need for movement restrictions this time, notwithstanding the spike (Fakhri, 2023). The current news of reported health situations shows that there is still a need to be ready should a more widespread pandemic arise. Therefore, the findings of the study could alert the relevant authorities of UiTM Cawangan Pahang as well as other related higher learning institutions about the challenges of ODL that might lead to students' distress; thus, coming out with appropriate preventive measures to help curb the problem, should another pandemic occur.

Literature Review

Stress, Anxiety and Depression

Stress, which comes from the Latin word "estrica," is a warning indication about people's well-being and tranquillity, and can be seen as a reflection of mental and emotional responses that are frequently linked to events that are improperly managed (Basha & Kaya, 2016). The study also stated that stress applies to "keeping integrity" as well as "making an effort to become basic." Related to the result obtained, stress becomes an unpleasant mental experience with predictable changes in biochemistry, metabolism and behaviour that can affect both physical and mental health. Therefore, stress can be classified as something that exists in life and in people's structures as well.

Anxiety, which was coined from the Ancient Greek word "anxietas" brings the meaning of worry, fear and curiosity (Basha & Kaya, 2016). As cited by Aydemir and Bayraktar (1996) in Basha and Kaya (2016), anxiety refers to as the unconscious state of a person that occurs against internal threats. It is a mental state marked by feelings of stress, worrying thoughts and physical shifts, such as elevated blood pressure, with respect to anxiety.

The most prominent cause of health problems and injury worldwide has been confirmed to be depression, and reports have found that more than 300 million individuals are now dealing with depression, a rise of more than 18% between 2005 and 2015 (World Health Organization, 2017). Depression is a common psychiatric illness that is characterized by among others, intense depression, and lack of interest in things you usually love, loss of motivation, followed by an inability to perform everyday activities for a period of two weeks; sleeping disorder; lethargy; self-hatred, remorse, or misery; and suicidal thoughts (World Health Organization, 2017).

Stress, Anxiety and Depression among Students during ODL

COVID-19 pandemics, which hit the world starting December 2019 has increased the anxiety rate of people around the globe and caused an increase in mental health issues including stress, anxiety, depression, and others. The spread of this pandemic has had a huge impact on human beings, especially

health, economic, educational, and social activities. Not only the physical, but also the psychological health of society at large and students who live off campuses are directly affected by the risk caused by this COVID-19 strain. The new shift from conventional classroom to online distance learning mode has not only brought mixed reactions from the students all over the world but studies have shown that students' performances were also affected due to the stress and anxiety brought by the pandemics (Cao et al., 2020; Razali et al., 2023). The educational scene has also changed drastically where students are left uncertain about their lives and their studies, with industrial schooling, clinical placements and rotations postponed for an undefined period (Lovibond & Lovibond, 1995). Ahmed et al. (2020) stated that fear and uncertainty that lead to stress and anxiety are common in crises such as COVID-19, thus it is essential to implement appropriate mental health interventions to those affected. These students must face a lot of obstacles and challenges in adapting to online learning including lack of infrastructure and facilities such as adequate gadgets and stable internet connection.

A study conducted among 1117 students from 23 universities all around Turkey to determine the students' stress and situational anxiety levels found that more than 50% of the students had struggled with early signs of stress and anxiety during the spread of the pandemic (Cao et al., 2020). Vidyadhara et al. (2020) also found that students were experiencing higher levels of stress, anxiety, and depression because of the closing down of educational institutions. The study involved 500 college students in India, who were advised to practise social distancing and self-isolation to reduce the risk of COVID-19 spreading. The findings showed that 26% of the students reported having serious to extremely serious depressive symptoms, 31.5% reported having serious to extremely serious anxiety symptoms, and 19% reported having serious to extremely serious stress, following the Indian government's lockdown announcement.

Another research involving 2530 selected Spanish university students also shared the same result on depression, anxiety, and stress (Odriozola-González et al., 2020). The Depression Anxiety Stress Scale (DASS-21) utilised in the study showed that 34.19% of participants reported having experienced symptoms of mild to excessively serious depression, 21.34% claimed to struggle with symptoms of mild to excessively serious anxiety, and 28.14% of the participants struggled with symptoms of mild to excessively serious stress after two weeks of lockdown. In addition, 50.43% of the respondents claimed to experience mild to serious psychological effects due to COVID-19. Furthermore, Wang et al. (2020) who conducted their study merely 14 days after China announced the COVID-19 outbreak found that 53.8% of participants experienced mild to extreme psychological effects of the COVID-19 pandemic spread; 16.5% suffered mild to extreme symptoms of depression; 28.8% of them experienced mild to extreme symptoms of anxiety, while 8.1% struggled with mild to extreme levels of stress.

In a study conducted on 157 undergraduate students of the Noakhali Science and Technology University (NSTU) Bangladesh found that there was a significant positive correlation between the students' lack of attention in study and their mental and emotional circumstances that included feelings of anxiousness, depressed, stress, lethargy, loneliness, and dread/worry amidst the COVID-19 spread (Muniruzzaman & Siddiky, 2021). Hence, the researchers concluded that the outbreak of COVID-19 virus has caused harmful consequences on the respondents' psychological conditions that lead them to feel inattentive in their study (Muniruzzaman & Siddiky, 2021). This finding is also supported by other studies which were conducted among selected college students in China; the results showed that the students had higher levels of anxiety, stress, and depression symptoms during the COVID-19 pandemic, and later affected their focus on the study (Hasan et al., 2020). A study done by Rahiem (2021) aligned with this perspective, as she found several fears and concerns experienced by the students at a public university in Jakarta, Indonesia. 80 respondents claimed that their well-being, both physically and psychologically, was affected by having to learn via online platforms at home due to the lockdown period during the spread of the COVID-19 pandemic. They stressed that online learning strained their eyes and body posture as they have to sit for long hours in front of a computer, and the act of being in a lockdown caused them to feel depressed, anxious, bored and lethargic (Rahiem, 2021).

In relation to the pandemic, stress is also closely associated with anxiety that could lead to depression among the students during the online learning mode. With growing anxiety, uncertainty, increased stress, and fear of the future and sorrow, the psychological effect is markedly significant to students. Previous studies have strongly indicated that rates of anxiety and depression are significantly rising, compounded by uncertainties and the intense media attention on this pandemic over every other issue (Cao et al., 2020). The result also was highlighted by other researchers which stated that higher levels of stress and anxiety due to the switch of traditional learning into online learning contributed

significant effects among higher learning students, thus affecting their study performances (Elmer et al., 2020; Razali et al., 2023).

Methodology

The questionnaire used in the study was divided into four sections; Part A comprised questions on respondents' demographic background, Part B comprised questions on stress (seven items), Part C consisted of questions on anxiety (seven items) and Part D consisted of depression questions (seven items). The questions for Parts B, C and D were adopted from the DASS-21 scales questionnaire which is in a 4-point Likert-scale format that ranges from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). The sample consisted of 848 (19.85%) out of 4271 students from Universiti Teknologi MARA Cawangan Pahang, who enrolled in at least one semester of ODL sessions. Primary data was collected in this study using a questionnaire which was distributed online via a Google Form format. Data entry, internal consistency reliability analysis, confirmatory factor analysis (CFA) and structural equation modelling (SEM) were conducted using IBM-SPSS AMOS version 24 software. The hypotheses tested in this study were as follows:

- H₁: Stress has a significant effect towards students' depression during ODL sessions.
- H₂: Anxiety has a significant effect towards students' depression during ODL sessions.

Findings and Discussion

The Confirmatory Factor Analysis: Analysing the Measurement Model

The model was required to go through a test to ensure its accuracy and consistency, as well as its quality of measuring a single construct. All the 21 items were subjected to a confirmatory factor analysis where the factor loadings must exceed the minimum required value which is more than 0.6. Figure 1 shows that the factor loadings of two items (A1 and A2) were below the required level so that the unidimensionality of the measurement model was not confirmed. In addition, the proposed measurement model also had to fulfil minimum requirements of construct validity, convergent validity, and discriminant validity. The construct validity based on fitness indexes in Figure 1 also did not meet the required level (Table 1) as recommended by the literature (Zainudin, 2015).

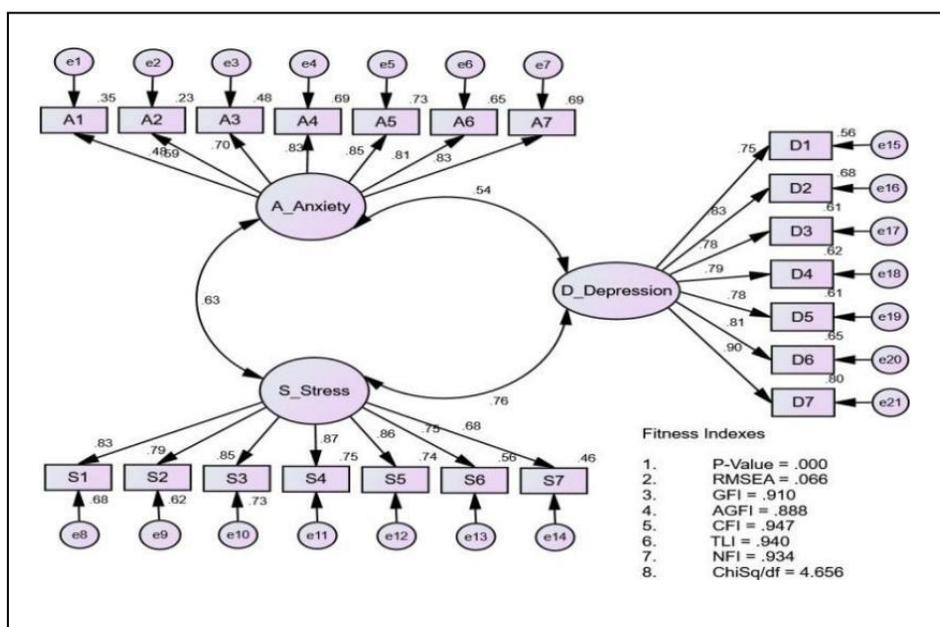


Fig. 1 Measurement model

Table 1. Three categories of model fit measures for construct validity

Name of category	Name of index	Index full name	Level of acceptance
Absolute Fit	Chi-Square	Discrepancy Chi-Square	P-value > 0.05
	RMSEA	Root Mean Square of Error Approximation	< 0.08
Incremental Fit	GFI	Goodness of Fit	> 0.90
	AGFI	Adjusted Goodness of Fit	> 0.90
	CFI	Comparative Fit Index	> 0.90
	TLI	Tucker-Lewis Index	> 0.90
Parsimonious Fit	NFI	Normal Fit Index	> 0.90
	Chisq/df	Chi-Square/ Degrees of Freedom	< 3.00

The fitness indexes achieved the required level after the modification to the measurement model (Figure 2) was made by identifying the correlated items via modification index values including the removal of five items (A1, A2, S4, D1 and D6). The convergent validity was assessed through average variance extracted (AVE) whereby the minimum threshold value for AVE is 0.5 (Hair et al., 2010). The calculated AVE values of each construct as shown in Table 3 were more than 0.50, thus confirming the convergent validity. The square root of the AVE of each construct was higher than its corresponding correlation coefficients, thus ratifying the discriminant validity as stated in Table 3. In terms of reliability of the measurement model, the computed composite reliability (CR) values and the AVE exceeded the required level of 0.6 and 0.5 respectively, which confirmed the reliability of the measurement model.

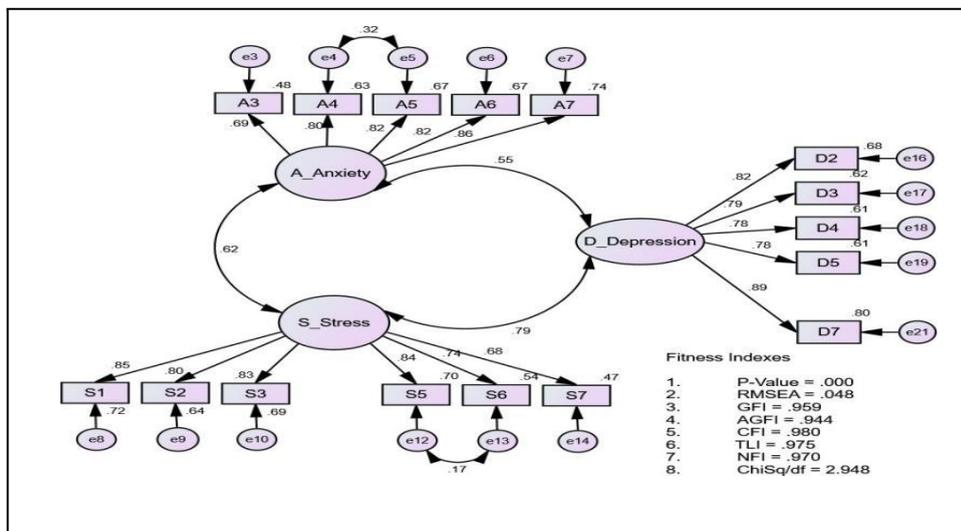


Fig. 2 Modification to the measurement model

Table 2. Goodness of fit for measurement model

Name of category	Name of index	Value index	Result
Absolute Fit	RMSEA	0.048	Minimum value achieved
	GFI	0.959	Minimum value achieved
Incremental Fit	AGFI	0.944	Minimum value achieved
	CFI	0.980	Minimum value achieved
	TLI	0.975	Minimum value achieved
	NFI	0.970	Minimum value achieved
Parsimonious Fit	Chisq/df	2.948	Minimum value achieved

Table 3. Validity and reliability of each construct

Item Number	Stress	Anxiety	Depression
1	0.85	0.69	0.82
2	0.80	0.80	0.79
3	0.83	0.82	0.78
4	0.84	0.82	0.78
5	0.74	0.86	0.89
6	0.68		
AVE	0.640	0.628	0.661
CR	0.898	0.910	0.907

Table 4. Discriminant validity index summary

Construct	Stress	Anxiety	Depression
Stress	0.792		
Anxiety	0.622	0.800	
Depression	0.785	0.550	0.813

Therefore, it could be concluded that the measurement model fits the data since all the requirements were successfully fulfilled. The completed questionnaire based on the measurement model after the modification process were tested with the reliability test using Cronbach's alpha to ensure the questionnaire was reliable to be used at the minimum value of 0.7 (Hair et al., 2010; Zainudin, 2015) whereby results revealed that all the constructs met a minimum requirement (Stress = 0.908, Anxiety = 0.901, Depression = 0.902). The normality assessment showed that the data was normally distributed due to the absolute values of skewness being 1.0 or lower (Hair et al., 2010) so that further analysis could be conducted to achieve the above research objectives.

Respondents' Background and Descriptive Analysis

A total of 183 (21.6%) male and 665 (78.4%) female students aged more than 18 years old from various faculties from two UiTM Cawangan Pahang campuses - Jengka and Raub, were involved in this study. 726 (85.6%) of them were in the diploma programs, while the rest (122, 14.4%) were in the degree programs. The result of descriptive analysis results in Table 5 revealed that depression ($M = 1.23$) affected students more compared to stress ($M = 1.17$) and anxiety ($M = 1.02$). This result was consistent with the study by Odriozola-Gonzalez et al. (2020) where they found that depression affected students more compared to anxiety and stress in the learning process during the lockdown period. This result showed that the students were depressed during the teaching and learning process via ODL mode due to the average depression level obtained. As stated earlier, the depressed feeling was much related to the lack of interest in doing routine activities and the participants may sometimes experience negative feelings such as hopelessness or uselessness (World Health Organization, 2017). Even though the depression level among students during ODL mode were the highest among the three negative emotional effects, the students were also struggling with stress and anxiety due to the pandemic and the result was in line with previous studies (Cao et al., 2020; Odriozola-González et al., 2020; Vidyadhara et al., 2020; Wang et al., 2020).

Table 5. Descriptive statistics.

	Mean	Standard Deviation
Stress	1.17	.778
I found it hard to wind down (S1)	1.17	.885
I tend to over-react to situations (S2)	1.11	.930
I felt that I was using a lot of nervous energy (S3)	1.09	.968
I found it difficult to relax (S5)	1.13	.944
I was intolerant of anything that kept me from getting on with what I was doing (S6)	.96	.903
I felt that I was rather touchy(S7)	1.58	1.006
Anxiety	1.02	.841
I experienced trembling (e.g., in the hands) (A3)	.88	.932
I was worried about situations in which I might panic and make a fool of myself (A4)	1.06	1.013
I felt I was close to panic (A5)	1.01	.938
I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat) (A6)	1.05	1.033
I felt scared without any good reason (A7)	1.11	1.045
Depression	1.23	.755
I felt that I had nothing to look forward to (D2)	.93	.887
I felt downhearted and blue (D3)	1.40	.924
I was unable to become enthusiastic about anything (D4)	1.26	.907
I felt I wasn't worth much as a person (D5)	1.01	.957
I could not seem to experience any positive at all (D7)	1.56	.768

Structural Equation Modelling (SEM) Analysis

The following Figure 3 shows the structural equation modelling between all the constructs and the results are summarized in Table 6. This study revealed that 62% of the total variation of students' depression was explained by their stress and anxiety feelings, and another 38% was influenced by other factors. The percentage value obtained indicated that students' depression level was much affected by stress and anxiety.

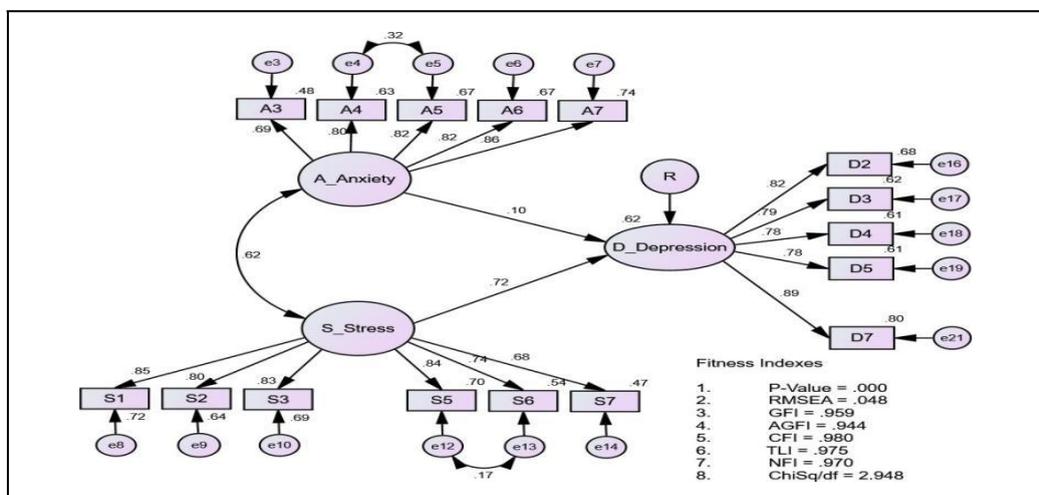


Fig. 3 Structural model

Furthermore, as presented in Table 6, there were significant positive effects of stress and anxiety towards students' depression ($\beta_1 = .704$, p -value $< .001$; $\beta_2 = .113$, p -value $< .01$) at 5% level of significance. These significant results were in line with Elmer et al. (2020) who found that stress and anxiety contributed significantly to depression. The positive estimation values for each variable indicated that as the stress and anxiety levels became higher, the depression level would also be higher simultaneously. In addition, the stress level contributed more effects towards students' depression compared to anxiety during ODL mode based on the higher estimated value.

Table 6. Standardized regression weights and its significance for each path

Hypothesis statement of Path Analysis	Estimate	p-value	Result
H ₁ : Stress has a significant effect towards students' depression.	.704	.000	Significant
H ₂ : Anxiety has a significant effect towards students' depression.	.113	.005	Significant

Conclusion

The shift from conventional classroom to ODL mode during the COVID-19 pandemic has received mixed reactions from students all over the world and studies have shown that students' performances were affected due to the emotional stress and anxiety brought by the drastic change. They were left uncertain about their lives and faced a lot of obstacles and challenges in adapting to online learning. Thus, the researchers found it imperative to explore the significant factors of stress and anxiety among the students during the ODL sessions and identify the effects of both variables towards depression among the respondents. Based on the findings, the study concluded that stress and anxiety factors contributed significantly towards feelings of depression faced by the students during the open distance learning process. Even though the pandemic COVID-19 has passed, and the life routine is now back to normal, it is hoped that the findings will enable the relevant authorities of the university to develop and implement strategies of several psychological interventions that may help minimize the stress factors of the students, thus reducing the depressed feelings they faced during such outbreak or any other similar situations in the future. It is intended that providing proper preliminary emotional support needed by those affected could help mitigate potential negative impacts on the students' mental health and assist the students to brace themselves for any other crises. This will help them complete their studies successfully, as well as preparing them for living their future lives emotionally stable.

Suggestions for Future Research

Given that all the data in this study were obtained using self-reported measures, the specific moment when respondents complete the survey could potentially introduce bias and impact their conclusions. This presents a potential issue when collecting data from participants simultaneously. A good or bad day could have a favourable or unfavourable effect on the respondents' opinions and responses. The participants were advised to relate to their ordinary, average feelings and attitudes to avoid such possible issues. According to Aminuddin (2023), even if the respondents tried to ignore the incidents, it is still likely to influence their responses. In addition, the respondents could fill out the survey without carefully considering the question, which puts the validity at risk of inadequate response collected from the respondents. Therefore, it is suggested that future research employs a longitudinal study to examine the students' emotions across time.

Future research also suggested employing another approach to investigate mental health among students, such as The Warwick-Edinburgh Mental Well-being Scale (WEMWBS). This scale consists of 14 items that aim to monitor the mental well-being of the general population and be able to detect meaningful changes in adults. The use of a short version of the questionnaire could avoid the respondent's weariness and false responses (Aminuddin, 2023). Participants' interest should be sustained in answering the questionnaire to prevent them from marking their responses without carefully considering the appropriate response.

Co-Author Contribution

The authors confirmed that there is no conflict of interest in this article. Author 1 carried out the fieldwork and was responsible for the overall concept of the article. Author 2 and Author 4 wrote the research methodology and did the statistical analysis and interpretation of the results. Authors 3 and 5 prepared the literature review and references.

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