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Construct Validity and Internal Consistency Reliability of Mental Health Monitoring Instrument for Technical University Students

Poh Keong Pua[1*], Ming Foong Lee[2], Chee Sern Lai[3]

[1,2&3]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Malaysia

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Abstract: This study was conducted to generate empirical evidence on the construct validity and internal consistency reliability of the item of a mental health instrument. Construct validity through the face validity and content validity by expert looking at the items in the questionnaire and agreeing that the item is valid measure of the concept. However these studies more focus on the validation stage (quantitative data) of the research instrument. The reliability was examined by analysis SPSS to determine the internal consistency reliability using Cronbach's Alpha. A validation study with a random sample of 50 respondents undergraduate students from Universiti Tun Hussein Onn Malaysia (UTHM). The internal consistency reliability of the construct depression, anxiety, stress and fear was very impressive with Cronbach's alpha value in the range 0.847 to 0.865. Each item from each constructs, only seven items from overall 40 items with the weak coefficient correlation but each item still in the good internal consistency reliability with the range 0.8 to 0.9. In conclusion, this study has established valid construct for development of instrument for assessing the mental health level to improved mental health well-being and academic performance.

Keywords: Construct validity; internal consistency; mental health instrument; depression; anxiety; stress; fear

1. Introduction

Mental health is a relationship between psychological well-being individual with abilities to adapt various situations. According World Health Organisation (2014), mental health defined as a state of well-being individual to realise his or her ability, can cope with the normal stresses of life, can work productively and able to make contribution to the community. Mental health is an important part every state of human life as well as physical health, but most is overlooked on their internal well-being (Lee & Syaid, 2017). Therefore, emotional, psychological and social individual will directly impact how a person thinks, feels, acts which also related to daily life activity performance. To ensure individual have a well-being mental health, each individual needs to be aware of their capability to ensure that he/she can overcome pressure well, good productivity and efforts to contribute to the community. Meanwhile, Canadian Association of Social Workers (2018) also mention about mental health are relationship between the individual, the group and the environment which strengths and abilities of the individual interacting effectively with those of the group and with opportunities and influences in the environment. If an individual is not able to control his/her mental health in an appropriate manner, then a variety of symptoms and effects will appear, and thereby disturbing not only his/her mode of living, but also affecting other people around him/her. According to the National Health and Morbidity Survey 2015, the prevalence of mental health problems among young adults (aged between 16 and 35) in Malaysia in 2015 was 29.2 per cent, which was a three-fold increase from 10.7 per cent in 1996. It worsening state of mental health problems among Malaysian students, from

*Corresponding author: puapohkeong@yahoo.com
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one in 10 individuals in 2011 to one in five in 2016 and the most common mental problems are depression, anxiety and stress (Bernama, 2016; Awaluddin, Abdul Ghani & Salleh, 2017).

Based on the finding research mental health from Lee and Syaid (2017), there are three technical university students randomly selected, which indicated that about 11.3% of them tended to have a specific intervention in depression, about 22.9% tended to have a specific intervention in anxiety and 4.8% tended to have a specific intervention in stress. This finding is in the line with research findings on a technical university students which resulted 9.6% of them tended to depression, 19.8% tended to anxiety and 4.5% tended to have a specific intervention in stress (Lee & Lai, 2017). This outcome seems have a clear signal that mental health problem will increase if preventive precautions are neglected. Beside of depression, anxiety and stress that associated and emphasised as mental health or common psychological problem among the student (Ratanasiripong, Kaewboonchoo, Hanklang & Chumchai, 2015; Dyrbye, Thomas, & Shanafelt, 2006), fear also can be categorised as part of mental health. According research finding from Pua, Lai and Lee (2017) identifying mental health elements among technical university student using Fuzzy Delphi method, resulted that have four elements such as depression, anxiety, stress and fear that fulfill requirement consensus of expert group with percentage more than 75%.

Additionally, there are several factor such as social and environment (Cheng & Cheng, 2017; Shamsuddin, Fadzil, Wan Ismail, Azhar Shah, Omar, Muhammad, Jaffar, Ismail, Mahadevan, 2013), parent expectation (Cheng & Cheng, 2017), future career (Kumar & Bhukar, 2013, Ali, Rao, Ali, Ahmed, Safi, Malik & Husan, 2014), physical and biological (Mind Wise, 2016; MedicineNet, 2016), interpersonal (Ali, et al, 2014; Qiu & Yan, 2009) and academic (Shamsuddin, et al, 2013; Qiu & Yan, 2009) will directly impacted on mental health students and due to the current education system in Malaysia, which requires students to work hard and put in more effort to achieve the high demands of the system. As a result, when students long term feel deeper in pressured, fear, anxiety, and depress, without any counseling and helping, mental health problem will address seriously become unwanted situations happening such as suicidal tendencies or suicide. A statement from Pillay (2017) suicide on the rise among Malaysia youth, the number 7,446 people had suicidal intentions compared with 5,739 people in 2015 at Kuala Lumpur. Unfortunately, the statistic data show that 21% of the age group suicide intention is between 21-30 years old, which the higher percent from aspect occupation breakdown is student. Therefore it is important and should be taken seriously and help given to those affected in order to enhance their mental health well-being and academic performance.

There are several of self-reporting tool designed to measure the psychological distress using various age groups either in Malaysia or oversea. Depression Anxiety Stress Scale (DASS) is a one common and widely used scale that clearly distinguishes depression, anxiety, and stress in each demographic group (Henry & Crawford, 2005), while, there are no specific and appropriate psychological measurement tool that can be applied on university students especially technical university students. Therefore, effective screening is extremely vital to detect and solve such issues associated with mental health problem symptoms, there's a need to establish a instrument/tool by adaptation from DASS and new terminology element of fear from consensus of expert group (Pua, Lai & Lee, 2017) where fulfill and consort with technical university students to improve the well-being lifestyle and indirectly increase academic achievement. In this study, we aim to establish such an instrument, empirical evidence on the validity and reliability of drafted items are necessary.

2. Methodology

This study utilised both qualitative and the quantitative research methods. The qualitative method involved in-depth interviews and document reviews while the quantitative method involved data collection through the newly developed instrument which adaptation a part of DASS inventory. Extract item from DASS-42 inventory which ten items for each construct depression, anxiety, and stress, while construct item fear develop from interview and document reviews based on students condition. Each construct with ten items are fulfils on Behavioural & Social Sciences Research (2018), with mention that indirect construct often consist of 10 to 20 items or more from each construct. Face validity and content validity through the expert looking at the items in the questionnaire and agreeing that the item is valid measure of the concept. However, this paper will only focus on the validation stage (quantitative data) of the research instrument development process involves a survey are randomly distribute to 50 respondents undergraduate students from University Tun Hussein Onn Malaysia (UTHM) as suggested by Cooper and Schindler (2011) the sample size in between 25 to 100 respondents. The data in Likert scales were collected and analysed using the Statistic Packages for the Social Sciences Version 23 (SPSS) to identify internal consistency reliability using Cronbach's alpha and inter-correlation among four contracts and each item.

3. Findings and Discussion

To determine the validation of mental health instrument, the data collected were analyzed based on four construct, there is depression, anxiety, stress and fear. Table 2 illustrates the internal consistency reliability using Cronbach's Alpha as follows: depression (0.847), anxiety (0.860), stress (0.865), fear (0.858) and overall (0.946). The cut-off criterion was based on at least 0.7 for it to be reliable. Table 1 shows the rating scale of instrument quality criteria (De Vellis, 2012). As such, all construct were found to be reliable based on the Cronbach's alpha value with achieved good internal

consistency and among all 4 construct was to acquire excellent internal consistency. Internal consistency found in this study for depression, anxiety and stress (0.847, 0.860, 0.865) were higher than those reported with internal consistency of 0.84, 0.74 and 0.79 by Ramli, Ariff, and Zaini (2007), 0.75, 0.74 and 0.79 by Ramli, Salmiah and Nurul Ain (2009) and 0.68, 0.67 and 0.70 by Hashim, Golok and Ali (2011) respectively.

Table 1- Rating scale instrument quality criteria (De Vellis, 2012)

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 2- Reliability Analysis (Internal Consistency) of the Mental Health Instrument Using Cronbach's Alpha

Construct	Items	Cronbach's Alpha
Depression	B1, B2, B3, B4, B5, B6, B7, B8, B9, B10	0.847
Anxiety	B11, B12,B13,B14,B15,B16,B17,B18,B19,B20	0.860
Stress	B21, B22, B23, B24, B25, B26, B27, B28, B29, B30	0.865
Fear	B31, B32, B33, B34, B35, B36, B37, B38, B39, B40	0.858
Overall	B1-B40	0.946

Table 4 shows the summary of the 10 item of each construct for mental health (depression, anxiety, stress and fear) with the reliability and correlation value. The result of the analysis show that items for the construct depression, anxiety, stress and fear have a range of reliability between $0.9 > \alpha \geq 0.8$ with the internal consistency in good level, while only four item from construct depression (B2, B5, B8 and B10), one item from construct anxiety (B15), two item from construct stress (B21 and B28) and two item form construct fear (B32 and B34) with the correlation in weak performance (refer Table 3). From the overall, all item from each construct are maintained with all item fulfill with the requirement reliability value (more than 0.7).

Table 3- Rating scale coefficient of correlation index (Chua, 2011)

Correlation size (r)	Performance
0.91 until 1.00	Very Strong
0.71 until 0.90	Strong
0.51 until 0.70	Moderate
0.31 until 0.50	Weak
0.01 until 0.30	Very weak
0.00	No correlation

Table 4- Reliability Analysis (Internal Consistency) of the Each Construct Using Cronbach's Alpha

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Construct Depression				
B1	9.14	26.817	0.744	0.816
B2	8.82	27.865	0.476	0.841
B3	8.92	26.361	0.663	0.822
B4	8.66	27.045	0.604	0.828
B5	8.98	29.122	0.394	0.847
B6	8.86	27.633	0.538	0.834
B7	8.94	26.588	0.663	0.822
B8	9.44	29.353	0.446	0.842
B9	9.70	28.990	0.593	0.832
B10	9.08	29.422	0.394	0.846
Construct Anxiety				
B11	6.90	22.418	0.582	0.846
B12	6.76	22.839	0.555	0.848

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B13	7.24	24.513	0.514	0.852
B14	7.26	23.829	0.593	0.846
B15	6.70	23.520	0.480	0.855
B16	7.14	22.694	0.643	0.841
B17	7.30	24.010	0.594	0.846
B18	7.20	23.755	0.553	0.848
B19	6.96	21.672	0.657	0.839
B20	6.92	22.647	0.564	0.848
Construct Stress				
B21	9.94	34.139	0.401	0.865
B22	9.72	30.818	0.690	0.843
B23	9.68	32.263	0.576	0.853
B24	9.50	32.378	0.552	0.854
B25	9.52	32.214	0.615	0.850
B26	9.42	30.249	0.641	0.847
B27	9.72	30.083	0.710	0.841
B28	9.72	33.349	0.355	0.873
B29	10.02	31.081	0.694	0.843
B30	9.96	31.876	0.586	0.852
Construct Fear				
B31	8.64	31.968	0.553	0.846
B32	8.08	32.379	0.415	0.859
B33	8.54	31.274	0.610	0.841
B34	8.48	32.418	0.496	0.850
B35	8.60	30.694	0.669	0.836
B36	8.44	30.823	0.512	0.851
B37	8.82	31.130	0.642	0.838
B38	8.70	32.173	0.594	0.843
B39	8.48	31.561	0.627	0.840
B40	8.72	31/104	0.590	0.842

Table 5 show the highest inter-correlations between anxiety and depression with a value of 0.758 demonstrating significant overlap between the two domains.

Table 5- Construct Inter-Correlation and Correlation Matrix of the 40 item

Construct	Construct Inter-correlations			
	Depression	Anxiety	Stress	Fear
Depression	1.000			
Anxiety	0.758	1.000		
Stress	0.582	0.666	1.000	
Fear	0.612	0.710	0.571	1.000

4. Conclusion

The present study showed that the mental health is a highly valid and reliable instrument to measure self-perceived depression, anxiety, stress and fear among technical university student in Malaysia. Item analysis using SPSS to identify the reliability and correlation between each construct and measurement through the use of two indices, item reliability index and coefficient of correlation index. The reliability coefficient of scores obtained in the study indicates that the items used are stable. A review of the reliability and validity of the content of the instrument indicate that all item from each construct are acceptable for the mental health instrument. This mental health instrument can be used by technical university student, counsellors and lecturer to identify mental health (depression, anxiety, stress and fear) level to seriously prevent addressing mental health issues among technical university student.

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References

Ali, A., Rao., M.H., Ali, S., Ahmed, T., Safi, M., Malik, A., & Husan, B. (2014). Prevalence of Anxiety and Depression and their Associated Risk Factors among Engineering Student in Karachi, Pakistan. *International Journal of Emerging Technology and Advanced Engineering*. 4 (9): 52-55.

Awaluddin, S. M., Abdul Ghani, M. K. A., Salleh, R. (2017). *National Health & Morbidity Survey*. Public Health Institute. Retrieved from http://www.iku.gov.my/index.php/research-eng/list-of-research-eng/iku-eng/nhms-eng/nhms-2017.

Behavioral & Social Sciences Research (2018). *Objective Measurement of Subjective Phenomena*: *The Construct or Characteristic to be Measured*. Retrieved from http://www.esourceresearch.org/eSourceBook/ObjectiveMeasurementofSubjectivePhenomena/3TheConstructorCharacteristictoMeasure/tabid/696/Default.aspx

Bernama. (2016, September 12). Mental Health of Malaysian Students cause of worry: Health Ministry. *New Straits Times*. Retrieved from https://www.nst.com.my/news/2016/09/172683/mental-health-malaysian-students-cause-worry-health-ministry

Canadian Association of Social Workers. (2018). The Role of Social Work In Mental Health. Retrieved from https://www.casw-acts.ca/en/role-social-work-mental-health.

Cheng, S.V., Cheng, F.F. (2017). What Causes Stress in Malaysian Students and it Effect on Academic Performance: A Case Revisited. *Advanced Journal of Technical and Vocational Education*. 1 (1): 155-160.

Chua, Y.P. (2011). *Kaedah dan Statistik Penyelidik*. Edisi Kedua. Kuala Lumpur. McGraw-Hill.

Cooper, D.R., dan Schindler, P.S. (2011). *Business Research Method*. Edisi Ke-11. Singapura: Irwin McGraw Hill.

De Vellis R.F. (2012). *Scale Development: Theory and Applications* (3rd Edition). Thousand Oaks, California:SAGE.

Dyrbye, L. N., Thomas, M. R., & Shanafelt, T. D. (2006). Systematic Review of Depression, Anxiety, and Other Indicator of Psychological Distress Among U.S. and Canadian Medical Students. *Academic Medicine*, 81, 354-373.

Hashim, H. A., Golok, F., & Ali, R. (2011). Factorial Validity and Internal Consistency of Malaysian Adapted Depression Anxiety Stress Scale -21 in an Adolescent Sample. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 3, 29-39.

Henry, J. D. & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large nonclinical sample. *British Journal of Clinical Psychology*, 44, 227-239.

Kumar, S., & Bhukar, J.P. (2013). Stress level and coping strategies of college students. *Journal of Physical Education and Sports Management*. 4 (1): 5-11.

Lee, M. F. & Syaid, S. (2017). Factors Contributing towards Malaysian Technical University (MTU) Students' Mental Health. Pertanika Journal Social Sciences & Humanities. 25:93-100.

Lee, M. F., & Lai, C. S. (2017). Exploring Learners' Mental Health Profile: A Study in UniversiI Tun Hussein Onn Malaysia. *International Research and Innovation Summit: Material Science and Engineering.* Article 012194, Doi:10.1088/1757-899X/226/1/012194.

MedicineNet (2016 September 12). *What causes mental illness?* Retrieved from http://www.medicinenet.com/mental_illness/page2.htm.

Mind Wise (2016 September 12). *What cause mental illness*. Retrieved from http://www.mindwisenv.org/index.php?option=com_content&view=article&id=63&Itemid=86

Pillay, S. (2017 May 28). *Suicide on The Rise Among Malaysia Youth*. Retrieved from https://www.nst.com.my/news/exclusive/2017/05/243354/suicide-rise-among-malaysian-youth.

Pua, P. K., Lai, C. S., Lee, M. F. (2017). Identifying Mental Health Elements Among Technical University Students Using Fuzzy Delphi Method. *International Research and Innovation Summit: Material Science and Engineering.* Article 012189, Doi:10.1088/1757-899X/226/1/012189.

Qiu, L. & Yan, B.B. (2009). *Stressful Life Events, Coping Strategies and Mental Health Problems Among Chinese Vocational College Students*. 3rd International Conference on Bioinformatics and Biomedical Engineering. (pp.1-4). Beijing: IEEE.

Ramli, M., Ariff, M. F., & Zaini, Z. (2007). Translation, Validation and Psychometric Properties of Bahasa Malaysia version of Depression, Anxiety, Stress Scale (DASS). ASEAN *Journal of Psychiatry*. 8(2): 82-9.

Ramli, M., Salmiah, M. A., Nurul Ain, M. (2009). Validation and Psychometric Properties of Bahasa Malaysia Version of the Depression Anxiety and Stress Scale (DASS) among diabetic patient. *Malaysian J. of Psychiatry*, 18(2): 40-5

Ratamasiripong, P., Kaewboonchoo, O., Ratanasiripong, N., Hangklang, S., & Chumchai, P. (2015). Biofeedback Intervention for Stress, Anxiety, and Depression Among Graduate Students in Public Health Nursing. *Nursing Research and Practice*, Article ID 160746, Doi:10.1155/2015/160746.

Shamsuddin, K., Fadzail, F., Wan Ismail, W.S., Shah, S.A., Omar K., Muhammad, N.A., Jaffar, A., Ismail, A., & Mahadevan, R., (2013). Correlates of depression, anxiety and stress among Malaysian university students. *Asian Journal of Psychiatry*. 6 (4): 318-323. Article Doi: doi.org/10.1016/j.ajp.2013.01.014.

World Health Organization (WHO) (2014). Mental Health: A State of Well-Being. Retrieved from http://www.who.int/features/factfiles/mental_health/en/.