ORIGINAL ARTICLE

Malay Version of Acceptance and Action Questionnaire-II (AAQ-II): A Reliability and Validity Analysis in Non-Clinical Samples

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ABSTRACT

INTRODUCTION: Experiential avoidance is a key psychological process variable that measures the level of neglect or avoidance of unpleasant personal psychological experiences. It is highly correlated with the psychological flexibility construct, and both of these are important components in Acceptance and Commitment Therapy (ACT). Acceptance and Action Questionnaire-II (AAQ-II) has been used to measure both constructs and the Malay version of AAQ-II has been translated and validated in the clinical sample. Hence, this study aimed to assess the psychometric properties of the Malay version of AAQ-II in a non-clinical sample. **MATERIALS AND METHOD:** The participants were recruited from 3 campuses of Universiti Malaysia Sabah namely UMS-Labuan International Campus (UMSKAL), Sandakan campus, and the main campus in Kota Kinabalu. Convenience sampling was employed and the snowball method was used to recruit participants. All participants answered online questionnaires, which consist of sociodemographic information as well as the Malay version of AAQ-II, Mindfulness Awareness and Attention Scale (MAAS), General Health Questionnaire-12 (GHQ-12), and Balanced Index of Psychological Mindedness (BIPM). Both classical test theory and Rasch measurement theory were used to check the reliability and validity. **RESULTS**: There were 370 participants in this study. Malay version of AAQ-II demonstrated good psychometric properties with Cronbach's alpha of 0.932, parallel reliability of 0.844, and satisfactory Rasch analysis. Exploratory factor analysis supported a one-factor model with 7-items. AAQ-II scores were positively correlated with depressive and anxiety scores, and lower levels of mindfulness and psychological mindedness, supporting the concurrent and convergent validity. **CONCLUSION**: Malay version of the AAQ-II has adequate reliability and validity in assessing psychological inflexibility in the non-clinical sample and hence could be a useful psychological instrument in assessing COVID-19 mental health effect.

Keywords
acceptance; commitment; psychological inflexibility; experiential avoidance

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Received: 26th April 2021; Accepted: 21th February 2022

Doi: https://doi.org/10.31436/imjm.v21i3

INTRODUCTION

Experiential avoidance (EA) refers to avoidance or neglect of internalised experiences of a psychological nature, for instance, memories, feelings, urges thoughts, and physical sensations. Such wilful neglect causes individuals to act value-incongruously, resulting in untold psychological sequelae.[1] A correlated concept is psychological flexibility, which refers to the ability to be flexible with one's thoughts in order to deal with such personal psychological experiences. Acceptance and Commitment Therapy (ACT) explicitly focuses on heightening psychological flexibility and redressing experiential avoidance.[2] The Acceptance and Action Questionnaire (AAQ) is a related instrument quantifying the degree of efficacious action in view of such private experiences, and the degree of rejection of such internal psychological processes.[3] There were psychometric issues, mainly revolving around reliability, precluding widespread adaptation of the original AAQ.[4] As a direct response to its statistical drawbacks, the revised Acceptance and Action Questionnaire-II (AAQ-II) was designed.[4] Just like the AAQ, it remains a self-rated scale, reduced to seven items only, on a Likert scale with 7 gradations (ranging

from 1= "never true" to 7= "always true"). Lower totals imply higher psychological flexibility and more severe experiential avoidance, with the converse being true for higher scores. Both psychological constructs appear to transcend cultural boundaries, as the AAQ-II retains its superior psychometric properties in five European validations.[5]

Malaysia underwent a nationwide Movement Control Order for two months, whereby university students were not allowed to go outside the campus and not allowed to return to their hometowns.[6,7] Research has focused on measuring levels of depression and anxiety among these students;[8] however, it is even more crucial to measure the underlying psychological processes that could potentially mediate the relationship between psychopathology and other variables, e.g. coping styles. If there exist validated instruments to measure psychological flexibility, then it would be easier to design targeted interventions revolving around it if it is measured. Given the high level of psychopathology that can ensue in quarantined populations,[9–12] it is crucial that we have a Malay validation expedited.

A Malaysian AAQ-II has recently been validated in a clinical sample of oncology patients.[13] However, there has not yet been a similar validation for non-clinical populations which hampers the generalizability of the validated AAQ-II. This is especially prescient in the current COVID-19 pandemic, where high levels of fear and anxiety are projected to sweep across the world, and hence it is even more essential that we understand the underlying psychological processes better.[14,15] Hence, this paper aims to assess psychometric properties in a non-clinical sample of the Malay version of the Acceptance and Action Questionnaire-II (Malay AAQ-II). This will allow us to assess better levels of psychological flexibility in a more generalisable population that does not have psychopathology or physical pathology.

METHODS

Prior to project commencement, the Medical Research Ethics Committee of Universiti Malaysia Sabah provided regulatory consent and vetting. Informed consent was obtained from all participants.

The original AAQ-II researchers granted permission for questionnaire validation. A three-stage translation was performed with extant WHO instrument validation and translation guidelines (WHO,2018)

Stage 1: Two bilingual psychiatrists translated the AAQ-II. Both of them assessed the semantic equivalence of all 7 items of the scale between Malay and English. We then got two fluent speakers of Malay and English, both of whom were specialists and university lecturers, to back translate it into both Malay and English. Inconsistencies between the forward and back translations were subsequently ironed out with the assistance of all 4 translators through a committee. This process yielded the harmonised translation.

Stage 2: Pilot testing was performed with 20 Malay speakers, who confirmed the lexicon employed by the Malay AAQ-II translation was mutually intelligible with what they understood. Lexicon with semantic or phonological inconsistencies was redressed accordingly. This process yielded a final translated version of Malay AAQ-II.

Stage 3. The final translated version of Malay AAQ-II was administered in a validation study design. 370 Malay and English-speaking non-clinical samples from University Malaysia Sabah, were recruited. The study participants completed five separate questionnaires: a simple demographic questionnaire, the Acceptance and Action Questionnaire-II (AAQ-II) both in Malay and English version, the validated Malay version of Mindfulness Attention and Awareness Scale (MAAS), the validated Malay version of the General Health Questionnaire (GHQ-12) and the Malay version of the Balanced Index of Psychological Mindedness (BIPM) which was translated and preliminary-validated (Pang et al., 2020)

Convenience sampling was employed, and snowball methods were used to recruit samples in 3 campuses of Universiti Malaysia Sabah namely UMS-Labuan International Campus (UMSKAL), Sandakan campus, and

the main campus in Kota Kinabalu. Students from this institution are from all over Malaysia and not only from Borneo island that able to understand Bahasa Melayu as one of the requirements to enter any public university in Malaysia is to pass Bahasa Melayu with distinction.

Google Forms were utilised with incorporated consent forms, and questionnaires consist of sociodemographic information and research instruments, in order to minimise the risk of COVID-19 transmission as well as to adhere to the strict social restriction. Research instruments include the Malay version of Acceptance and Action Questionnaire-II (AAQ-II), the Malay version of Mindfulness Attention and Awareness Scale (MAAS), the Malay version of General Health Questionnaire-12 (GHQ -12), and the Malay version of Balanced Index of Psychological Mindedness (BIPM). A sample size of 350 was planned to be recruited as a good sample size, with an estimated correspondent-to-item ratio of 50:1.[16] The study instruments contained the following documents:

Questionnaire concerning Sociodemographic Details: This tabulated gender, age, and years of schooling which correlated with education level.

Acceptance and Action Questionnaire-II (AAQ-II)

AAQ-II consists of seven questions assessing experiential avoidance or psychological inflexibility. A Likert scale containing seven items with seven discrete gradations (ranging from 1= never true (*tidak benar*) to 7= always true (*benar sepenuh masanya*)) was employed. Lower totals imply higher psychological flexibility and more severe experiential avoidance, with the converse being true for higher scores. The English version AAQ II had a Cronbach's alpha = 0.84 solidifying its internal consistency.[4] The Malay version of AAQ-II had Cronbach's alpha of 0.91 (in cancer patients), corroborating the internal consistency of the English version, as well as excellent parallel reliability with ICC = 0.94.[13]

Mindfulness Attention and Awareness Scale (MAAS)

MAAS measures mindfulness as one construct and is commonly used as a mindfulness questionnaire among general populations. Mindfulness refers to the act of focusing attention mindfully, purposefully, without judgement, and in the present.[17] MAAS operates as a six-point Likert scale, with fifteen items measuring aspects of state mindfulness. With a Cronbach's alpha of 0.81, internal consistency and convergent reliability were statistically sufficient.[18] The corresponding Malay translation (Malay-MAAS) replicated that of the English version, as shown by Spearman's correlation of 0.82 ($p<.01$).[19]

General Health Questionnaire (GHQ-12)

GHQ-12 was introduced by Goldberg in 1979 and it is a widely accepted measure of psychological distress.[20] It is a twelve-item Likert scale with 4 separate responses: not at all (*tiada lansung*), no more than usual (*tidak lebih dari biasa*), rather more than usual (*lebih dari biasa*) and much more than usual (*sangat lebih dari biasa*). The former two answers score '0' whereas the latter two code as '1' (i.e 0-0-1-1). The GHQ-12 Malay version had a Cronbach's alpha value of 0.85 suggesting reasonable internal consistency.[21]

Balanced Index of Psychological Mindedness (BIPM)

BIPM is a self-reported instrument that measures psychological mindedness (PM).[22] It is a 14- item self-report scale with two subscales containing 7 items each. They map onto ability (Insight subscale) and interest (Interest subscale) in being psychologically minded. A five -point Likert scale ranging from 0 = not true (*tidak benar*) to 5 = very much true (*sangat benar*) is employed. BIPM showed good internal consistency with Cronbach's alpha of 0.85 and 0.76 for interest and insight respectively. A recently validated Malay version of the BIPM scale reported reasonable Cronbach's alpha of 0.82 and 0.87 for interest and insight respectively.[23]

Data analytic strategy

Due to social distancing requirements, the data collection was conducted online via Google Form questionnaires with electronic consent forms. Classical test theory (CTT) [24] and Rasch measurement theory (RMT) were employed to assess validity and reliability [25] at two levels, namely

scale, and item level. For the scale level, CTT tests included average variance extracted (AVE), composite reliability, standard error of measurement, concurrent validity, and Pearson's correlation testing to assess test-retest reliability between both Malay version versus English version and AAQ-II scale versus MAAS, BIMP, and GHQ-12, and a battery of interrelated methods assessing and corroborating internal consistency, namely Cronbach's alpha, McDonald's omega, greatest lower bound. For the RMT methods, item and person separation reliability, and item and person separation index were performed. On the other hand, for the item level, the CTT's methods employed were item-item correlation and item-total correlation. For the RMT, infit and outfit mean square (MnSq) and differential item functioning (DIF) were employed to assess measurement invariance. IBM SPSS 24.0 was used to run the CTT, while the RMT was run using jMetrik 4.1.1. JASP was employed to calculate the McDonald's omega and the greatest lower bound.

RESULTS

Descriptive statistics

Table I shows the respondents' background information. A total of 370 non-clinical participants were enrolled in this study. The mean age was 24 years old with a standard deviation of 5.4. 75.9% of them were female and 24.1% were male. All participants are university students, and all continuous variables in this study had skewness and kurtosis of <1.00 suggesting normal distribution.

Table I: The respondents' background information (n = 370)

Background	Category	N	%	Mean (SD)
Age				24 (5.4)
Age category	20 years old and below	52	14.1%	
	21-30 years old	265	71.6%	
	More than 30 years old	53	14.3%	
Gender	Male	89	24.1%	
	Female	281	75.9%	
Education	Diploma	56	15.1%	
	Bachelor's degree	267	72.2%	
	Master's degree	47	12.7%	

Reliability and validity

At the scale level

The validity and reliability of the new Malay version of AAQ-II are corroborated by the statistical criteria as demonstrated in Table II, with all the values exceeding the suggested cut-off points.

Table II: Psychometric properties for the Malay version of AAQ-II at the scale level (n = 370)

Psychometric method	Psychometric measure	Result	Suggested cut-off
CTT	Internal consistency measure using Cronbach's alpha	0.932	> 0.7
	Internal consistency measure using McDonald's omega	0.933	> 0.7
	Internal consistency measure using Greatest lower bound	0.959	> 0.7
	Parallel reliability (with English version)	0.844**	See Note
	Average variance extracted (AVE)	0.665	> 0.5
	Composite reliability	0.933	> 0.7
	Concurrent validity (with BIPM scale)	0.517**	See Note
	Concurrent validity (with GHQ scale)	0.619**	See Note
	Concurrent validity (with MAAS scale)	-0.436**	See Note
RMT	Item separation reliability	0.975	> 0.7
	Item separation index	6.210	> 2
	Person separation reliability	0.913	> 0.7
	Person separation index	3.239	> 2

*Correlation is significant at the 0.05 level (two-tailed test)

** Correlation is significant at the 0.01 level (two-tailed test)

Note: Correlation coefficients of < 0.25 were considered as small; 0.25–0.50 as moderate; 0.50–0.75 as good; and > 0.75 as excellent

At the item level

All inter-item correlation coefficients exceeded 0.3 on the Pearson correlations run (see Table III). Hence, the Malay AAQ-II is of acceptable statistical validity.[26] Furthermore, none of the corrected item-total correlation coefficients were below 0.5. This corroborates with both rule of thumb and empirical evidence suggesting that whereby item-to-total correlations are more than 0.50 and the inter -item correlations are more than 0.30, construct validity is satisfied.[27]

Table III: The item-item correlation matrix (n = 370)

Item	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Item 2	.724**					
Item 3	.645**	.773**				
Item 4	.804**	.712**	.658**			
Item 5	.659**	.690**	.678**	.678**		
Item 6	.629**	.599**	.645**	.564**	.641**	
Item 7	.618**	.626**	.611**	.654**	.656**	.681**

Item level analysis demonstrates that all factor loadings are more than 0.3, suggesting each item's importance.[28] As every communality was close to 1, this was suggestive that extracted factor explains the majority of the variance of individual items. Rasch's analysis of the Malay version of AAQ-II's properties also proved to be reasonable. Infit MnSq values were between 0.85 and 1.26, whereas outfit MnSq values were between 0.79 and 1.28. Such item fit statistics indicate that each item complies with the unidimensional requirement of a Rasch model, owing to the fact that all values fell within the 0.5 – 1.5 range.[29] The most difficult item was Item 4 "*Ingatan pahit saya menghalang saya untuk menjalani kehidupan dengan sepenuhnya"* (i.e. the highest value) and the most easier item was Item 6 "*Orang lain kelihatan menguruskan kehidupan mereka lebih baik daripada saya"* (i.e. the lowest value). As all the DIF contrast values were less than 0.5, no substantial DIF was found across gender.[30]

Dimensionality of the AAQ II Malay version

The dimensionality of the AAQ II Malay version was also checked using exploratory factor analysis. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the factor analysis as the value is more than 0.5 (0.903). Bartlett's test of sphericity (X^2 (21) = 1970.98, $p < .001$) also confirmed that a relationship exists between at least some of the seven items which means that the correlation structure is adequate for factor analysis. The principal axis factoring has confirmed the unidimensionality of the AAQ II Malay version as there was only one single factor extracted which can explain 66.51% of the variation in the seven items. The factor loadings are shown in Table IV.

Table IV: Psychometric properties of the Malay version of AAQ-II at the item level (n = 370)

Item	Factor loading*	Communalities	Infit MnSq	Outfit MnSq	Difficulty	DIF contrast across gender[ab]
Item 1 *(Pengalaman dan ingatan pahit menyebabkan kesukaran untuk saya menjalani kehidupan yang saya hargai)*	0.839	0.704	0.92	0.94	0.06	-0.06
Item 2 *(Saya takut pada perasaan saya)*	0.851	0.724	0.86	0.86	0.11	0.14
Item 3 *(Saya risau saya tidak dapat mengawal kebimbangan dan perasaan saya)*	0.821	0.674	0.97	0.93	-0.24	0.08
Item 4 *(Ingatan pahit saya menghalang saya untuk menjalani kehidupan dengan sepenuhnya)*	0.838	0.702	0.85	0.79	0.54	0.05
Item 5 *(Emosi menyebabkan masalah dalam kehidupan saya)*	0.818	0.669	0.98	0.97	-0.06	0.18
Item 6 *(Orang lain kelihatan menguruskan kehidupan mereka lebih baik daripada saya)*	0.758	0.575	1.26	1.28	-0.67	-0.03
Item 7 *(Kebimbangan saya menghalang saya untuk berjaya)*	0.779	0.607	1.13	1.19	0.26	-0.35

MnSq is mean square error, DIF is differential item functioning

*Extraction method: Principal axis factoring.

[a]DIF contrast > 0.5 indicates substantial DIF

[b]DIF contrast across gender = difficulty for males (reference group) - difficulty for females (focal group). Positive values indicate items that are differentially easier for the focal group than the reference group. Negative values indicate items that are differentially harder for the focal group than the reference group.

DISCUSSION

Psychological inflexibility in a Malay language-speaking non-clinical population is a construct worth further research and attention, and this project conclusively provides evidence of superior reliability and validity for the Malay AAQ-II as an instrument to measure this particular construct. This is secondary to multiple peer-accepted steps in the validation process, beginning with language- and content-expert-driven translations and back translations in both directions, harmonisation followed by pilot testing, culminating in statistically significant sample size and unimpeachable statistical methods founded on RTT and CTT. Concurrent validity with scales measuring similar constructs, namely general psychological distress, mindfulness, and psychological mindedness demonstrate reasonable correlations, thus confirming that the AAQ-II measures similar constructs.

AAQ II Malay version in non-clinical samples demonstrates Cronbach's alpha value of 0.932, hence demonstrating comparable internal consistency with the original AAQ II with α=0.84, Greek version with α= 0.92, Chinese version with α=0.82, Turkish version with α= 0.84, Portuguese version with α=0.89, and Hungarian version with α=0.90.[2,4,31–34] The one-factor model is also in line with other language validations which also show unidimensional factor results.

It is essential that we have suitable instruments to measure psychological processes in individuals. Despite commendable efforts to measure the levels of depression and anxiety during this pandemic time, it is unfortunately not sufficient; it is important that researchers focus on the underlying psychological processes that mediate the relationship between factors like coping styles and psychopathology. This will both clarify theoretical mechanisms, and also allow us to have targeted interventions toward psychological processes that appear to be deficient.

A validated Bahasa Malaysia scale is hence important to research these underlying psychological processes. There is a dearth of Bahasa Malaysia scales available currently – only scales for psychological mindedness and mindfulness are currently available, and this study will hopefully allow more high-impact research to be performed in mediational settings to explore the theoretical processes underpinning psychopathology.

This study demonstrates particular limitations which need to be highlighted. Firstly, we conducted this study during Movement Control Order (MCO) due to the outbreak of the COVID-19 coronavirus in the world which also affected Malaysia. All Higher Education Institutions (HEIs) including Universiti Malaysia Sabah (UMS) students were quarantined in their hostel at the university. They were not allowed to go outside of the campus during the MCO and were separated from their families. Hence, all data was collected via Google Form questionnaires, potentially contributing to response bias. However, there is evidence suggesting equivocal results whether or not traditional or Internet sampling methods are employed.[35] The sampling method in university students also meant that restrictions on age range existed. The consequent focus on young adults with a mean age of 24 years old and the over-representation of females (75.9%) might be factors that reduce the generalisability of the results to the general population. However, the methodology of this paper is also similar to other validation studies, which have used undergraduate populations of homogenous backgrounds.

As students were quarantined and separated from their families during the outbreak, we anticipated that there would be artificially high anxiety or even depression among the quarantined students.[14]

We did not include depression anxiety stress scales (DASS) for the concurrent validity as this instrument mainly measures psychological symptoms instead of psychological mindedness.

In addition, we expected that there would be a high proportion of false-positive results, which would reflect normal psychological distress in such trying times.

However, it is also valuable that we measure psychological flexibility in students during quarantine. Various interventions, including a specific COVID-19 intervention targeting psychological distress and psychological flexibility, have been designed during the pandemic and have seen encouraging results in Hospital UMS frontline workers qualitatively.[36] This COVID-19 intervention draws from multiple micro-skills derived from ACT, and hence, it is theorized to be able to improve psychological flexibility. However, to truly measure the efficacy of an available intervention, it is also best that we measure levels of psychological flexibility before and after the intervention, and this validated scale will allow it to be done effectively. The other limitation of this study was that not many scales have been validated in the Malay language so far, and cultural sensitivity is a key issue to address in collecting accurate data.[37] So, it was difficult to do other scales for concurrent validity for this current study utilizing same-language instruments, as most instruments available measure depression or anxiety levels instead. However, a Malay-language fear of Covid-19 scale validation was published retrospectively by the same authors; unfortunately, as this data was collected well prior to that, we were unable to incorporate it into this study.[15] At the same time, another limitation is whether this scale can be used as a recognised scale in practice; hence it is crucial that this scale was validated in a non-clinical population, as the previous scale was validated in a clinical population. There will be more applications of this scale in non-clinical populations and it will be crucial for the psychometric properties to be reassessed then.

CONCLUSION

The study findings confirm that the AAQ-II Malay version is a psychometrically sound instrument in both clinical and non-clinical samples, with good internal consistency and concurrent validity. Hence, this is a vital addition to a set of instruments that can measure psychological process variables in Malay. Having relevant validated instruments will allow us to perform large-scale research projects on the Malay-speaking population that needs it so that efficacious and culturally sensitive interventions can be designed and performed with immediate urgency on a population that is likely to experience a second "mental health pandemic" after the physical health pandemic of COVID-19 dies down.

CONFLICT OF INTEREST & FUNDING

All authors wish to declare that they have no conflict of interest with respect to their involvement in the publication. This study received research grant funding under Special Fund Scheme Universiti Malaysia Sabah (SDK0195-2020).

ACKNOWLEDGEMENT

The authors would like to express our sincere appreciation to Associate Prof Dr. Suzaily Wahab (Universiti Kebangsaan Malaysia) for her valuable guidance and input in producing the manuscript.

ETHICAL APPROVAL

Ethical approval was obtained from the Universiti Malaysia Sabah Medical Research Ethics Committee Medical Ethics Committee prior to the commencement of this project. All procedures performed in this study involving human participants were in accordance with the ethical standards of the University's Research Ethics Board and with the 1975 Helsinki Declaration, as revised in 2000.

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