Original Paper

Cross-cultural Adaptation of the Reliable and Valid Malay Version of Alcohol Use Disorder Identification Test

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Abstract

Background: Early detection of alcohol abuse and associated risk(s) is necessary. It requires easy and reliable screening tools that are culturally adapted to the local context. Objectives: The aims of this study were to cross-culturally adapt, test for its reliability and validity of the Malay version of Alcohol Use Disorder Identification Testing (AUDIT-M). Methods: The cross-cultural adaptation process involved four stages: translation, synthesis, back translation and field pre-testing. The final version of AUDIT-M was pre-tested and post-tested within a 10-day interval among 37 respondents at the Tampin Health Clinic. Analysis of reliability and validity testing were done using SPSS version 21. Results: There were 37 participants in this study. The Intra-Class Correlation (ICC) with single measures of the test-retest scores was 0.93 (Cronbach alpha = 0.97), while the internal consistency reliability yielded (Cronbach alpha=0.92). Validity testing for the Pre-test and Post-test analysis with the Pearson correlation analysis was r=0.938. Conclusion: The translated Malay version of the AUDIT-M was found to be easy to understand and adaptable in the Malaysian context.

Keywords: AUDIT Translation, Malay language, Reliability and Validity

Introduction

Alcohol consumption is related to increased morbidity and mortality rates in the world. The World Health Organization (WHO) estimates that there are about 2 billion people worldwide consuming alcoholic beverages and 76.3 million diagnosed with alcohol use disorders. The harmful use of alcohol causes considerable public-health problems and it is ranked as the fifth leading risk factor for premature death and disability in the world [1].

The National and Health Morbidity Survey (NHMS) II first reported the burden of alcohol consumption in 1996, which revealed 29.2% of the non-Muslim
Malaysian population ever consumed alcohol, while 23.0% reported as current drinkers. However NHMS II only captured the non-Muslim adults aged 18 years and above [2]. The subsequent NHMS III, conducted in 2006 reported the prevalence of ever consumed alcohol as 16.2% while 7.4% of current drinkers with apparent improvement, [3]. In contrast with other surveys, the Malaysian Non-communicable Diseases Survey-1 (MyNCDs-1) reported a prevalence of 12.2% of current drinkers in 2007 among respondents aged 24 to 65 years old [4]. Despite having these data, the trends of consumption and abuse of alcohol in the country remains obscure due to three factors: firstly, these studies did not include alcohol drinkers among the Muslim population, [5, 6]. Secondly, it captured different non-comparable age groups and thirdly, there are no regular and dedicated surveys that use a standard instrument aimed in capturing the trends of alcohol consumption and abuse in the country.

The lack of data leads to consequential low levels of awareness and priority in prevention programmes dealing with alcohol drinking. There are currently no systematic programmes dealing with or treating alcohol abuse in the country, [5]. This contradicts with the way substance abuse problems are being handled including extensive epidemiological, prevention and treatment programmes to help drug users, especially in the case of opiate addiction. Data on alcohol use and its related problems are needed, not only to monitor the magnitude and trends of alcohol–related harms, but also to strengthen advocacy and design effective interventions.

The WHO has developed a tool that can screen for risky alcohol use and assist in devising an appropriate intervention strategy to minimise the risk related to alcohol consumption, [7]. The WHO uses a set of questionnaires called the Alcohol Use Disorder Identification Test (AUDIT), a self-administered questionnaire comprising of 10 questions, used to assess the risks related to alcohol intake, dependence and adverse consequences. The AUDIT has been validated in several countries for its sensitivity and specificity in identifying risky drinkers and related problems, [8-11]. AUDIT is sensitive in assessing severe alcohol problems, but also is able to detect low risk and hazardous drinking. Therefore, it is particularly suitable for a population-based study, where the prevalence of alcohol related problems is lower than in clinical settings. Information on the types of drinkers and related problems provides the basis in planning evidenced based strategies and activities for preventing and reducing alcohol related harm. Furthermore, AUDIT helps to generate data for epidemiological monitoring and surveillance that can assist in informing and facilitating effective policy formation.

The AUDIT is useful in Malaysia to facilitate the screening, early identification and intervention of alcohol related problems. However, the drawback is that the AUDIT is only available in English and in several other languages but not in the national language. As screening for alcohol use is widely available at the government-based primary health care clinics in Malaysia, therefore, there is a need to have a standardized and validated Malay language version before it can be used widely in Malaysia. The objective of this study is to translate the AUDIT into the Malay language while keeping in view Malaysia's cultural context. Stated differently, it is sought to cross-culturally adapt, test for its reliability and validity of the Malay language version of AUDIT.

**Methods**
Subjects

The study was conducted in Tampin Health Clinic, a rural clinic located in the district of Tampin, Negeri Sembilan, Malaysia. There were 37 eligible respondents which included patients and medical staff, literate in the Malay language (national language), who consume alcohol and without health problems. Approval for the study was obtained from the Medical Research Ethics Committee (MREC), Ministry of Health Malaysia. Eligible respondents were briefed about this study, which was to assess their understanding about the set of AUDIT-M questionnaires.

Pretesting Instruments

Two study instruments were used; WHO Alcohol Use Disorders Identification Test (AUDIT) and the Malay language translation of the 10-item AUDIT (AUDIT-M).

The WHO-AUDIT uses a 10-item scale with possible scores ranging from 0 to 40, detecting current hazardous drinking, based on three aspects: alcohol intake, dependence and adverse consequences [12]. In assessing the severity of alcohol consumption, the score of the AUDIT questionnaires were divided into 4 categories: zone 1 (score 0-7); social drinker, zone 2 (score 8-15); hazardous drinking, zone 3 (score 16-20); harmful drinking, and zone 4 (score ≥ 20); probable dependence.

The Expert Committee

The Expert Committee (EC) was made up of one (1) Family Medicine Specialist, four (4) Public Health Physicians, two (2) Psychiatrists and one (1) Language professional. This EC consolidated all the versions of AUDIT to develop the final version of AUDIT-M. The equivalence between the Malay version and the English version was discussed thoroughly with written documentation of the issues and the rationale for deciding on the final form. Each decision about the final form of AUDIT-M was made after considering the semantic, idiomatic, experiential and conceptual equivalence between AUDIT-M and AUDIT.

Questionnaire Translation

The English version of the AUDIT (E1) was translated into the Malay language through the cross cultural adaptation process, following the guidelines suggested by Beaton et al., [13]. It involved four stages, namely, translation, synthesis, back translation, and pretesting of the instrument.

Stage 1: Initial translation

Two groups of translators (T1 and T2) were tasked to do the forward translation. T1 was a group of physicians that comprised of 2 psychiatrists, 1 family medicine specialist and 4 public health physicians who were aware of the concepts being examined in the questionnaire. This was to ensure that the Malay language version would be equally reliable from a measurement perspective. T1’s forward translation was named M1 while, the second group (T2) consisted of just one Malay-speaking linguistic and her forward translation was named M2.

Stage 2: Synthesis of the translation

An EC meeting comprised of 1 psychiatrist, 1 family medicine specialist, 2 public health physicians were called to synchronise M1 and M2. The outcome of the harmonization was a synthesised document called M3. A written report carefully documented the process of synthesis, the issues that arose,
and how they were addressed and resolved. All decisions were based on common consensus.

**Stage 3: Test of the Pre-final Version (Test Retest)**

As for the first step, M3 was distributed to 10 staff attached to the Ministry of Health who were fluent in both English and Malay. This test was intended to look for face validity and similarities between E1 and M3. All respondents agreed on the forward translation and the recorded AUDIT’s score on E1 and M3 were similar.

The pre-final version of the Malay version of the AUDIT (M3) was then pre-tested in the Tampin Health Clinic among 37 respondents from various alcohol drinking profiles. All respondents were gathered at one place and were asked to answer the questionnaire (pre-test). AUDIT-M was administered as a self-reported questionnaire. They were called back after ten days to re-answer the same questionnaire (post-test).

At the end of each session, the respondents were interviewed individually to evaluate their understanding of each question and their chosen response. Both the meaning of the question and the chosen responses were explored to ensure similarity in terms of understanding and content. Their feedback was taken into account by the research committee and was further discussed at the technical meeting.

**Stage 4: Back translation**

The technical meeting was called again to make modifications to M3 based on the feedback from the respondents during pre-test. This yielded a final Malay version (AUDIT-M). AUDIT-M was subsequently translated back to English by T1 and T2. The final version was pretested to ensure respondents understood the content of the instrument. The English translation and the research report were then submitted to the World Health Organization for approval.

**Statistical Analysis**

We tested the translated the AUDIT-M version for its reliability and validity to ensure the consistency of our instrument. Firstly, we performed the internal consistency reliability analysis for all the translated items that might influence the composite score of the AUDIT-M. We examined the Cronbach alpha for the internal correlation reliability analysis for all corrected item-total correlation with the acceptance correlation, r > 0.4.

Secondly, we performed an Intra-Class Correlation (ICC) analysis for the test-retest analysis between the pretest and post-test scores for AUDIT-M by checking the single measures ICC of the one-way random model. For validity testing, we performed concurrent validity by plotting a scatter plot to compare the pre-test score and post-test score of Audit-M. We used bivariate correlation analysis to examine the correlation between the two scores at r >0.70. The stability of the modified version was further examined by using paired samples t-test in order to analyse the changes in mean scores between the pre-test and post-test in a 10-day interval. Descriptive analysis was also performed to examine the characteristics of sample population and all data were analyzed using SPSS version 21.

**Results**
**Socio-demography Characteristics of Respondents**

There were 37 respondents with a mean age of 41.03 (SD 9.9). Majority of respondents were males (92%) and by ethnicity breakdown: 35.1% Malays (n=13), 5.4% Chinese (n=2) and 59.5% Indians (n=22). Most respondents were married (72.2%), single respondents formed a quarter of the sample while the rest were divorced (2.8%). By education background, 6.1% received primary education, 78.8% had secondary education while 15.2% had tertiary education. The mean duration of alcohol consumption was 19.8 (SD 10.3 years) while the age of initiation of alcohol consumption was 22.1 (SD 4.6 years old). The mean salary of participants was RM 1,486.62 (SD 1,164.90). Majority reported drinking beer (72.9%) followed by other liquor (24.3%) and wine (2.7%). The median score for pre-test was 9.00 (IQR 11.0) while post-test was 6.00 (IQR 11.0). By the types of drinkers, 35.1% (n=13) were low risk drinkers and 64.9% (n=24) were risky drinkers. Further stratified by risky drinker; 45.9% (n=17) hazardous drinkers, 8.1% (n=3) harmful drinker and 10.8% (n=4) probable dependence.

**Part 1: Synthesis of the Questionnaire Translation**

The AUDIT-M was piloted among 37 respondents. Their comments on the Malay language version questionnaire are shown in Table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Initial word</th>
<th>Suggested word</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Setahun yang lepas (Past one year)</td>
<td>12 bulan yang lepas (During the last 12 months)</td>
<td>“Month” is more appropriate to “Year” which specifically means 1 year from the date of the interview</td>
</tr>
<tr>
<td>Q3</td>
<td>3 responden (7%) keliru dengan perkataan “enam atau lebih minuman beralkohol pada satu masa” (3 respondents (7%) were confused regarding “six or more drinks on one occasion”)</td>
<td>Dikekalkan (Maintained)</td>
<td>The technical meeting decided to maintain the words as there were no better alternatives and respondents from other localities were able to understand and give appropriate responses.</td>
</tr>
<tr>
<td>Q5</td>
<td>3 responden keliru dengan ayat “gagal untuk melakukan...” (The words “gagal untuk” were replaced with “tidak boleh”</td>
<td>“gagal untuk” digantikan dengan “tidak boleh”</td>
<td>The alternative words were more often used and easily understood while the word “gagal” was related to ‘failure’ in academic achievement.</td>
</tr>
<tr>
<td>Q6</td>
<td>Seorang responden keliru dengan perkataan “Keesokan harinya”. One respondent could not understand the “Keesokan harinya”</td>
<td>“Keesokan harinya” ditukar kepada “esoknya”</td>
<td>The alternative word “esoknya” was more often used and easily understood rather than “Keesokan harinya”</td>
</tr>
</tbody>
</table>
Reliability and Validity Analysis

Part 2: Reliability test

**Intra-Class Correlation (ICC) – For test and re-test score of AUDIT-M**

The test showed acceptable internal consistency for the pre-test score and post-test score with a Cronbach alpha value of 0.97. ICC with single measures was 0.93 with a variance of 283.4.

**Internal Consistency of the AUDIT-M questionnaire**

The Cronbach alpha for the AUDIT-M items was 0.92; alpha being more than 0.80. Of the 10 items in the AUDIT-M, 5 items maintained a high item-total correlation of 0.8 and above; item 3 and 4 were less than 0.8. While we observed negative correlations for item 1, 9 and 10. (Refer Table 2).

### Table 2. Corrected Item-Total Correlation and Cronbach Alpha for AUDIT-M, (n=37)

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
</table>
| Q1 | Dalam tempoh 12 bulan yang lepas berapakah anda minum minuman beralkohol?  
For the past 12 months how often have you had a drink containing alcohol? | -.581 | .930 |
| Q2 | Kebiasaannya pada hari yang anda minum, berapakah anda minuman beralkohol?  
Jumlah pengambilan minuman beralkohol mestilah mengikut minuman alkohol seperti yang ditunjukkan dalam Kad AA.  
How many alcoholic beverages do you have on a typical day when you are drinking? The total amount of alcohol consumed should be calculated in terms of standard drink consumed per day as shown in Card AA. | .628 | .914 |
| Q3 | Berapakah anda minum enam atau lebih minuman beralkohol pada satu masa?  
How often do you have six or more drinks on one occasion? | .628 | .914 |
| Q4 | Dalam tempoh 12 bulan yang lepas, berapakah anda tidak boleh berhenti minum apabila anda mula minum minuman beralkohol?  
How often during the last 12 months have you found that you were not able to stop drinking once you had started? | .969 | .891 |
| Q5 | Dalam tempoh 12 bulan yang lepas, akibat dari minum | .969 | .891 |
| Q6 | Dalam tempoh dua bulan yang lepas, selepas sesi meminum minuman beralkohol dalam jumlah melebihi dari biasa, berapa kerapkah pada pagi esoknya anda perlu meminum minuman beralkohol sebelum memulakan hari anda?  
*How often during the last 12 months you needed a first drink in the morning to get yourself going after a heavy drinking session?* | .969 | .891 |
| Q7 | Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda rasa bersalah atau menyesal selepas minum minuman beralkohol?  
*How often during the last 12 months have you had a feeling of guilt or remorse after drinking?* | .969 | .891 |
| Q8 | Dalam tempoh 12 bulan yang lepas, berapa kerapkah anda tidak dapat mengingat apakah yang telah berlaku malam sebelumnya disebabkan anda telah mengambil minuman beralkohol?  
*How often during the last 12 months have you been unable to remember what happened the night before because you had been drinking?* | .969 | .891 |
| Q9 | Pernahkah anda atau orang lain tercedera disebabkan anda meminum minuman beralkohol?  
*Have you or someone else been injured as a result of your drinking?* | -.005 | .930 |
| Q10 | Pernahkah saudara atau kawan atau doctor atau anggota kesihatan mengambil berat atau mencadangkan supaya anda mengurangkan pengambilan minuman beralkohol?  
*Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?* | -.500 | .930 |

**Part 3: Validity Testing**

**Pearson Correlation score between Pre-Test (T1) and Post-test (T2)**

The scatter plot was plotted between the pre-test scores (T1) and post-test scores (T2) at a 10-day interval. There was a good correlation between both scores as shown in Figure 1, with Pearson correlation, $r = 0.938$ indicated the two comparable data scores agreed with each other. The stability of the modified version assessed using the paired samples t-test showed that there was a significant difference in the scores for pre-test (mean = 9.70, SD = 8.192) and post-test (mean = 8.62, SD = 8.908) in a 10-day interval; $t(36)=2.131$, $p=0.040$. 
Figure 1. The scatter plot of scores from the pre-test (T1) and post-test (T2)

Discussion

Screening of alcohol use with the AUDIT has been extensively used worldwide especially in primary health care settings and it has been translated with an acceptable reliability in various non-English speaking countries, [12, 14-16]. This study managed to derive a cross-cultural adaptation of reliability and validity of AUDIT into the Malay language version (AUDIT-M) with a Cronbach alpha of more than 0.9 that indicates an acceptable reliability as compared with the other non-English AUDIT [12].

Several countries have tested AUDIT and they found moderate alpha of 0.75 when used in the general population [17]. A modified AUDIT in Hong Kong reported high reliability coefficients ranging from 0.96 to 0.97 depending on how the AUDIT was administered, [18] and the AUDIT-K from Korea has a Cronbach alpha ranging from 0.80 to 0.82 [8]. European countries like Sweden and Greece also reported a satisfactory internal and test-retest reliability of the translated AUDIT [11, 19].

Aforementioned, the Hong Kong AUDIT is more stable with a high reliability as a result of modifications to improve the cultural sensitivity and its relevance to the local context [18]. The Hong Kong AUDIT has 13 questions with 20 items and the modifications were made based on local
drinking practices using additional information on commonly available alcoholic beverages and the percentage of alcohol content [18]. Similarly with the AUDIT-M, we customized information on traditional alcoholic beverages for item 2 to ensure that the instrument conforms to local culture. Another study of the Greek population reported their modified AUDIT questionnaire has improved their Cronbach alpha but no changes were made as the increment was minor [11].

Previously, a published study by Yee et. al had validated the Malay version of AUDIT where respondents were recruited among outpatients who attended psychiatric clinic and patients admitted to the psychiatric ward [20]. The use of screening questionnaire such as AUDIT in clinical settings could yield different outcomes because the severity of alcohol dependence might differs among patients with confirmed psychiatric morbidity [17]. In contrast, our study recruited healthy individuals without psychiatric morbidity in order to represent alcohol use in the general population. In contrast with previous study, we also recruited more Malay drinkers than other ethnicities where we could have more variability in terms of drinking pattern as the Malay drinkers exhibit hazardous drinkers than the Chinese who drink socially [21]. This explains the differences in the internal consistencies between their study and our study. Despite both studies yielded acceptable high internal consistency, our study yielded higher than that of previous studies. A high reliability and validity of this instrument indicate this instrument can be used as a tool for case finding, and it could provide data to estimate prevalence of alcohol use in general population [17].

Previous study by Yee et. al also focused on detecting alcohol abuse of which our study further expanded on assessing a wide spectrum of alcohol use from low risk, risky and probable dependence based on the WHO guideline [22]. The study had confirmed the use of AUDIT to detect alcohol abuse by constructed concurrent validation with several instruments such as Mini International Neuropsychiatric Interview, CAGE Assessment for Alcohol Abuse, and the Bahasa Malaysia version of the WHO Quality of Life-Brief scale (WHOQoL-Brief-M). However, we did not perform this step, as those instruments are more sensitive or suitable to be used among patients in primary care or emergency settings than to be used in the general population [17].

In this study, no modification or additional changes were made for the AUDIT-M. It was noted that the Cronbach alpha for the intra-class correlation and the internal consistency was high (0.80). Rephrasing some of the wordings and sentences that confused respondents resulted in an improved understanding and reliability of the AUDIT-M. Other studies reported a self-administered or anonymous questionnaire method which raised the Cronbach alpha index during data collection [9, 18]. Cronbach alpha of the AUDIT could also be improved by taking into account the study settings and socio-demographic characteristics [15, 18, 23]. The performance of internal consistency of AUDIT also depends on subject selection as one study found using AUDIT to screen alcohol use disorders was more reliable in clinical settings rather than non-clinical settings [17].

A study in Norway had investigated the failure to achieve the aims of cross-cultural adaptation instruments due to changes in society over time that might be no longer relevant to the current study sphere [24].
However, in this study we found that the translation and cross-cultural adaptation from the original AUDIT was still relevant and reliable to the Malaysian cultural and religious context. Therefore, the AUDIT was not merely translated linguistically, but it was adapted culturally to maintain its content validity at a conceptual level across different cultures.

Evidently asking respondents to highlight problematic words had contributed to the failure of cross-cultural adaptation process [24]. Nevertheless, during the field-testing of the questionnaire, some unclear questions were explained to respondents verbally. In addition, they were probed for the meaning of the questions and answers. Issues related to the instrument were discussed in the expert committee and were resolved through consensus. During back translation, the exact word in the original AUDIT was not always preserved; rather, the essence of the question was sought and retained. During the field-testing, it was noted that most respondents could understand the questions and answer options given to them. From our study, the median of total AUDIT-M score was significantly different between the pre-test and post-test; and this could be attributed to the brief intervention given to respondents in the primary care setting in order to reduce the harmful use of alcohol after the pre-test.

We have also discovered that several items have negative correlations for item 1, 9 and 10. Despite these three items having negative correlation, the overall internal consistency reliability analysis with a Cronbach alpha of 0.93. However, the authors decided not to omit, as those three items are very important items to detect current alcohol consumption for item 1, while item 9 and item 10 to assess alcohol-related problems [7]. Negative correlation might also be associated with any item detecting negative outcomes or symptoms, [25]. We postulate the three items intended to detect all the negative outcomes as a result of alcohol use.

**Limitations**

Prevalence of alcohol use in Malaysia is considered low because of its social stigma [26]. Consequently, we experienced difficulties in recruiting respondents who drink alcohol to participate in this pilot study resulting in sample size constraints. Adequate sample size for a pilot study is necessary to identify problems related to questionnaire items and subsequently to test for its reliability and validity in contrast with inferential statistics [27]. However, we managed to recruit 37 respondents who attended a single center in a rural area who were current alcohol drinkers and were willing to participate in the pre-test and post-test of this study. Nevertheless, we ensured that the variability of consumption patterns among our respondents ranging from alcohol use to alcohol abuse were determined. We couldn’t recruit more Chinese respondents in this study despite low risk alcohol drinking is more prevalent among the Chinese population [3]. This was further supported by the interpretation of the total AUDIT’s score that reflected various levels of risk to alcohol-related harm comprises of low-risk, hazardous and harmful alcohol use and probable-dependent.
This was a preliminary study looking at the cross-culturally adaptation, reliability and consistencies of the AUDIT-M. Further psychometric evaluation is needed to correctly classify alcohol drinkers based on their risk [16, 28]. We anticipate further research to identify the psychometric properties of AUDIT-M to ensure specific intervention based on alcohol risk problems among the Malaysian population.

Conclusion And Recommendations

AUDIT-M has been successfully cross-culturally adapted for the Malaysians. In addition, this study has also demonstrated a high reliability of the AUDIT-M. Therefore, we would like to recommend AUDIT-M to be used in Malaysia and other Malay speaking countries. We would also suggest the usage of AUDIT-M in any community or population-based survey to identify alcohol-drinking patterns, total consumption and other alcohol related problems among Malaysians. The AUDIT-M will be a good instrument for screening, early identification and intervention in the case of alcohol use and abuse. Screening with the AUDIT-M enables to identification of users who could benefit from early referrals, especially in primary health care settings in Malaysia.

Declaration Of Interest

None declared

Acknowledgements

We would like to thank the WHO for allowing us to use the AUDIT questionnaire. The authors are grateful to the Director General of Health Malaysia for allowing us to publish the findings of this study.

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