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Development of Translated Questionnaire Malay Subjective Exercise Experience Scale (SEES-M) to Measure Mood Related-Exercise

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Abstract: Exercise has a positive impact on the physical and mental aspects. The impact should be measured to examine the effectiveness of intervention and rehabilitation. The available instrument in the Malay version is limited and not specific to exercise. Thus, the Malay language instrument is necessary. This study started with translating the Subjective Exercise Experience Scale into Malay (SEES-M) and was followed by a validation study. A cross-sectional study design and purposive sampling were used. The development of this tool involves three types of validity. Content validity involved six experts evaluating each translated item based on four concepts: comprehensiveness, relevance, representation and clarity, using four Likert Scales. Construct validity was determined using Principal Axis Factoring (PAF), an Exploratory Factor Analysis (EFA) oblique rotation method. Concurrent validity was assessed using the Profile of Mood States (POMS). Content validity showed an acceptable content validity index (CVI) (0.92), Item-CVI (0.90), CVI/Ave-Scale (0.90) and concurrent percentage-average excellent value (ACP) (0.87). Construct validity indicates a factor load of over 0.40. The number of items and factors are maintained as the original version. Concurrent validity indicates an excellent relationship between SEES-M and POMS. In conclusion, the SEES-M indicates acceptable validity for assessing mood towards exercise in the Malaysian population. Nonetheless, SEES-M can be retested on athlete populations for future study.

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Keywords: Malay language instrument, Mood, Content validity, Construct validity

1. Introduction

Exercise has also been shown to positively affect mood [1] and psychological well-being [2]. Various instruments have been developed to assess psychological responses to the exercise stimulus. These instruments include Profile Mood Scale (POMS) and the Positive and Negative Affect Schedule (PANAS). Even though both tools have generally measured mood, it was widely used to measure the psychological effects of exercise. Thus, these instruments have some limitations regarding the measurement of exercise stimulus. POMS was developed by McNair, Lorr and Droppleman (1971) [3] and is likely to measure negative mood in adolescents only. However, the relevance of the items used for an exercise setting is questionable [4]. Therefore, PANAS, developed by Watson, Clark, & Tellegen (1988) [5], adequately reflects the negative and positive effects. The PANAS was reported to have better psychometric properties in the relation between physical activity and the psychological aspects of a person. Nonetheless, certain PANAS items are still arguable concerning their association with exercise [4].

Later, an instrument called Subjective Exercise Experience Scale (SEES) was developed by McAuley & Courneya (1994), which relates to an assessment of exercise stimulus. The SEES questionnaire was widely used in exercise studies [6, 7]. It consists of 12 items with three domains which are positive well-being (PWB), psychological distress (PD), and fatigue (FAT). However, it is only available in the original language. Subsequently, the effort to translate and validate SEES in developing a valid Malay version of SEES has been made.

1.1 Validation process

Developing a new or translated questionnaire version must undergo a translation validation study. The validation process aims to determine the degree of measurement it purports to measure[8]. There are various types of validity with different processes and evidence. One of the validation processes is content validity.
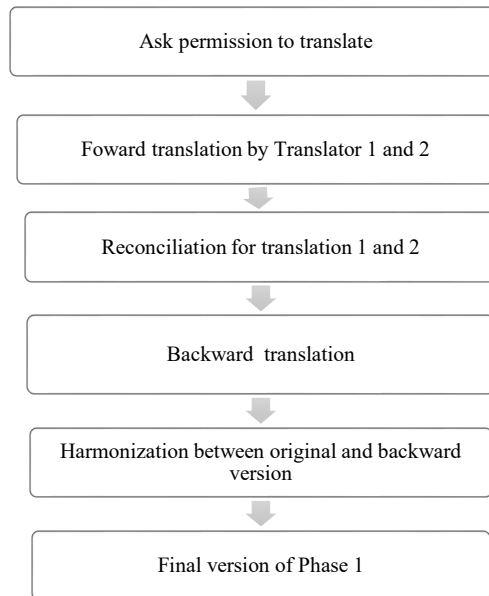
1.2 Types of validity

The content validity concerns the degree to which a scale has an appropriate sample of items representing the domains of interest [9]. Construct validity is a judgment based on collecting evidence from numerous studies using a specific measuring instrument [8]. Concurrent validity provides evidence about how well scores on the new measure correlate with other measures of the same construct or similar underlying domains that theoretically should be related [8]. Therefore, the primary purposes of validity are to determine the truthfulness and stability of the questionnaire. This study aimed to develop a new tool, a Malay version of the Subjective Exercise Experience Scale (SEES-M), to measure mood related-exercise.

2. Materials and Methods

This study consist of three phases started with Phase 1, Phase 2 and Phase 3.

2.1 Phase 1:Translation process

The procedures to develop this tool was started with translation process (**Figure 1**). The translation processes involve a forward translation and reconciliation process by two qualified translators who are familiar with both English and Malay from the original version (English) to the Malay SEES questionnaire. Then, the backward translation was performed by a certified translator who is also qualified as an English expert from Malay to English. Two panels performed the harmonization process to compare the backward translation to the original version. Finally, the preliminary version of the Malay version of SEES (M-SEES) was produced.

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┌─────────────────────────────────────────┐
│        Ask permission to translate        │
└─────────────────────────────────────────┘
                     ⬇
┌─────────────────────────────────────────┐
│   Foward translation by Translator 1 and 2 │
└─────────────────────────────────────────┘
                     ⬇
┌─────────────────────────────────────────┐
│    Reconciliation for translation 1 and 2  │
└─────────────────────────────────────────┘
                     ⬇
┌─────────────────────────────────────────┐
│            Backward  translation           │
└─────────────────────────────────────────┘
                     ⬇
┌─────────────────────────────────────────┐
│  Harmonization between original and backward │
│                  version                   │
└─────────────────────────────────────────┘
                     ⬇
┌─────────────────────────────────────────┐
│           Final version of Phase 1         │
└─────────────────────────────────────────┘
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Figure 1: Translation process

2.2 Phase 2: Content validity process

The preliminary translated version was tested for content, construct, and concurrent validities. All the procedures provided evidence for the development of this new tool. The content validity involved rating each item in M-SEES by six experts (n=6) based on four aspects: clarity, comprehensive, relevancy, and representative.

2.3 Phase 3: Field testing & psychometric

The field testing was conducted using a cross-sectional study by administering the questionnaire among 152 participants from 13 different institutions. The construct validity was determined using Principal Axis Factoring (PAF) of the oblique rotation method of Exploratory Factor Analysis (EFA). The PAF is the best method for non-distribution data [10, 11] and is unlikely to produce cross-loadings [10]. The suitability of the data for factor analysis was based on the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which must be greater than 0.50 and a significant of Bartlett's test sphericity. The concurrent validity was assessed by administering the M-SEES with POMS simultaneously. The measurement aims to know whether both questions measure the same construct. The Spearman Correlation Coefficient was used to determine the correlation between these two assessments. The data management and the statistical analysis were conducted using the Statistical Package of Social Science (IBM SPSS) version 23.0. The materials and methods section, known as methodology, describes all the necessary information to obtain the study results.

3. Results and Discussion

3.1 Results

Phase 1 (Translation) result: The forward and backwards translation was based on discussion and subjective judgement by the panels in the research team. The correct use of the words and language has been discussed. The translated version was approved with selected relevant terms and verification of backward translation.

Phase 2 (content validity) result: The content validity results revealed the acceptable content validity index (CVI) (0.92), mean Item-CVI (0.90), Scale-CVI/Ave (0.90), and the excellent value of average concurrency percentage (ACP) (0.87).

Phase 3 (field testing): The KMO measure of sampling adequacy was 0.79, and Bartlett's test of sphericity was significant (p<0.001). It was shown that the data was suitable for factor analysis. The factor loading showed an acceptable value (0.40), indicating a good correlation between items and their constructs. The communalities (extraction) of all items ranged from 0.30 - 0.69 and were practically acceptable. The Kaiser Criteria and scree plot were extracted through three domains for the data extraction factor. That three domains represented 61.78% of the cumulative percentage of the initial eigenvalue. The pattern matrix showed the factor loading of each item in its construct ranged between 0.46 and 0.90 with no cross-loading. Overall, the factor analysis showed a satisfying factor loading, indicating a good correlation between items and factors. The construct validity found that the SEES-M contains a similar number of items and construct. However, one of the items in SEES-M has been loaded to another construct, as shown in **Table 1**.The differrences between original and the Malay version shown in **Table 2**. The concurrent validity showed a significant correlation between SEES-M construct and POMS. The correlations ranged from weak to moderate (r = 0.30 - 0.40).

Table 1: The factor loading for each item

Item label	PWB	PD	FAT
PWB1	0.692		
PWB4	0.732		
PWB7	0.802		
PWB10	0.586		
PD2		0.450	
FAT3		0.552	
PD5		0.686	
PD8		0.577	
PD11		0.527	
FAT_6			0.712
FAT_9			0.526
FAT_12			0.815

*Notes: PWB = Positive well-being, PD = Physichological Distress, FAT = fatigue

Table 2: The differences between the original and Malay version

Item	Original	Malay
Number of items	12	12
Numbers of domains	3	3
Number of items based on the domains	PWB = 4 items PD = 4 item FA= 4 items	PWB = 4 items PD = 5 item FAT = 3 items

4. Discussion

To the best of our knowledge, this is the first study in developing the new tool of the Malay version of SEES. This questionnaire followed an extensive translation based on standard guidelines suggested by Wild et al. (2005) [12]. It was also undergone an extensive translation with three types of validation

processes. Based on this study, it was found that SEES-M shows an acceptable value for all types of validity studies. From the translation phase, the error in translating the term has resulted in items moving to another domain [10]. The final version of Phase 1 has been corrected before undergoing Phase 2. From the Phase 1 result, the word *Dashyat* in the item was changed to *Hebat* because *Dashyat* consists of multiple connotations in the Malay language. Thus, the word *Hebat* is the most suitable to represent positive connotation as in the original version. Phase 2 of this study showed that the developed instrument was acceptable in term of clarity, comprehensiveness, relevancy, and representative. This result was supported by an acceptable of content validity index.

For Phase 3, from construct validity, one item moved to another domain related to how this population perceived the meaning of *Lemah*. This study showed that using their own native language is much more valid. The *Lemah* has been translated from drained in the original version. In this study, Malaysian smokers perceived drained as psychological distress rather than fatigue (original version) [11]. The tested population has perceived the drained more severe and intensified. Therefore, after a series of validation processes, it was confirmed that this new instrument is valid for measuring mood in the Malay language. Indeed, the evidence of SEES-M validity from phases two and three of this study was acceptable and has been published at the national and international levels [11, 12]. However, this instrument has been tested among smokers thus, it was recommended to be tested among other populations such as athletes or physically active populations. Future validation is also recommended to be administered before the exercise activity.

5. Conclusion

The new development instrument consists of 12 items, the same as the original version. However, the number of items in the domain was slightly changed. The current study provided psychometric evidence for an appropriate, reliable, and valid new tool of the Malay version of SEES to measure mood-related exercise.

6. Acknowledgment

7. References

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