The Validity and Reliability of the Outcome Expectations of Exercise Instrument in the Indonesian Older Adult Population

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Abstract: This study aimed to assess the validity and reliability of an instrument measuring outcome expectations of exercise in Indonesian older adults. The content validity assessment was carried out by a panel expert (n=5). The internal consistency reliability was assessed in 126 older adults from an elderly community in Yogyakarta. Finally, the test and re-test analysis was carried out in 70 older adults who completed the same instrument a week later. The Indonesian version of the questionnaire exhibits excellent content validity index. The Cronbach's alpha value of the questionnaire was 0.95, which means that the questionnaire has excellent internal consistency. The test and retest analysis resulted in intraclass correlations that ranged from 0.53 to 0.86, which means that the reliability of the questionnaire was in the acceptable to good range. In conclusion, the findings provide preliminary evidence of the content validity and reliability of the Indonesian version of the instrument, thus, support the use of the instrument in the Indonesian older adult population.

1 INTRODUCTION

Older adults tend to experience a physiological decline that potentially leads to a decrease in their exercise participation (Bauman et al., 2016, Hale et al., 2017). They also often experience a decline in social cognitive functions, thus prevent them from being physically active (de Labra et al., 2015). Therefore, adequate supports are required for them to increase their physical activity levels.

The development of physical activity intervention needs to consider health behaviour change theories (Avery et al., 2012). One of the theories that is widely used for explaining and promoting physical activity behaviour is Social Cognitive Theory (Peyman et al., 2013). The constructs of the social cognitive theory include outcome expectations.

Outcome expectations, in this context, refer to individuals' perception of the benefit of exercise (Nabavi, 2012). This construct is considered as an important correlate of physical activity behaviour. Therefore, this construct can be used as a part of a framework in developing physical activity intervention strategies in the older adults population (Sallis et al., 2008).

Several instruments have been developed to measure the outcome expectations of exercise behaviour (Haas et al., 2010, Kroll et al., 2007).

However, the instrument was developed in English and validated in Western populations, and currently, none is available for use in the Indonesian older adult population.

The development of new instruments in Indonesian would require a lot of time and resources; thus, this study adapted an existing instrument measuring the outcome expectations of exercise behaviour (Resnick, 2005). However, looking at the differences in language and culture in Indonesia, it is necessary to measure the validity and reliability of the instruments. This process is essential to confirm the instruments' validity, since the psychometric properties of the original instrument are not necessarily retained after the translation process.

This study, therefore, aimed to assess the validity and reliability of the outcome expectations of exercise instrument in the Indonesian older adult population. It is expected that the study would result in the validated Indonesian version of the instruments to facilitate studies of the physical activity correlates in this population.

2 METHOD

2.1 Studies Population

The participants of psychometric studies were older adults in an elderly community in Yogyakarta. Most of the participants were female, high school graduates, married people, unemployed or retired people, and non-smokers.

2.2 Research Instrument

The instrument of outcome expectation was developed by (Resnick, 2005). The instrument measures a person's belief in obtaining benefits from participating in exercise activity. The instrument consisted of 13 items, with respond range from 1 'strongly disagree' to 5 'strongly agree'. For assessment, the responses of each question were scored by summing the numerical rank for each response and then divided by the number of responses. This instrument has been validated in the elderly American population and resulted in Cronbach's alpha of 0.89 (Resnick, 2005). The Indonesian translation of the instrument is provided in Table 1.

Table 1: The English and Indonesian Versions of the Instrument.

Item	Exercise :	Olahraga :
1	Positive	*Positif*
2	It makes me feel better physically	*membuat keadaan fisik saya terasa lebih baik*
3	It makes my mood better in general	*membuat mood saya lebih baik*
4	It helps me feel less tired	*membantu saya merasa tidak terlalu lelah*
5	It makes my muscles stronger	*membuat otot saya lebih kuat*
6	It is an activity I enjoy doing	*adalah kegiatan yang yang saya nikmati*
7	It gives me a sense of personal accomplishment	*memberi saya perasaan puas karena saya mencapai target yang saya inginkan/rencanakan*
8	It makes me more alert mentally	*membuat saya lebih awas dan siaga*
	It improves my endurance in performing my daily activities	*Membantu ketahanan fisik saya dalam menjalankan aktivitas sehari hari.*
9	helps to strengthen my bones	*membantu memperkuat tulang saya*
	Negative	*Negatif*
10	It is something I avoid because it causes me to be short of breath.	*adalah sesuatu yang saya hindari karena membuat saya terengah engah (kehabisan napas)*
11	It is something I avoid because it may cause me to have pain.	*adalah sesuatu yang saya hindari karena membuat saya mengalami nyeri*
12	It makes me fearful that I will fall or get hurt	*membuat saya takut bila saya akan jatuh atau terluka*
13	It places too much stress on my heart so I avoid it	*mengakibatkan jantung saya sangat terbebani sehingga saya menghindari olahraga*

2.3 Study Stages

This study included two main processes which were content validation assessment and psychometric tests based on the recommended technique by (Sousa et al., 2011)

2.3.1 Content Validity Test

The content validity assessment was conducted by five experts. They were two physicians' specialist in exercise physiology, one health behaviour expert, one registered nurse and one health promotion specialist. Each panel member was asked to assess each item

based on the relevance of the instruments to the local context and the clarity and symmetry of the wording. The proportion of experts who give each item as almost and very relevant/symmetric content validity is calculated to determine the content equality. The proportion is expected to be higher than 0.8 to be acceptable. This process resulted in a pre-final version of the Indonesian questionnaire, which would then undergo psychometric testing.

2.3.2 Psychometric Analysis

The pre-final questioners were field-tested to assess the internal consistency validity and reproducibility of the instrument. Cronbach's alpha is used as a measure of internal consistency reliability of scale scores. Repetition or reproducibility was measured using tests, and re-analyses carried out in a subset of participants over a 1-week interval. For analysis, testing and retesting was used, the intraclass correlation coefficient (ICC).

The internal consistency reliability was measured to assess whether the items in each pre-final translation instrument correlated with each other; in other words. The internal consistency reliability was measured of all scale items, along with each item' total item-corrected correlation, and alpha if the item is deleted. The cut-off point for an acceptable Cronbach alpha is more than 0.7, while the total corrected items are expected to be above 0.4 for indicating good item discrimination (Darren et al., 2003).

The tests and retest analysis were carried out on 70 participants, who were sub-samples of the internal consistency reliability study. The interval between the first and second assessments is seven days. Intraclass correlation (ICC) is calculated for instruments with continuous responses. The ICC above 0.4 is considered fair, while the one above 0.6 is considered good (Darren et al., 2003).

3 RESULTS

3.1 Content Validity Assessment

The five experts gave a rating as "almost" and "very" relevant/symmetric so that the ICV for all items met the required values (> 0.8). Therefore, further translation modification was not made, and the questionnaire then underwent psychometric assessment.

3.2. Internal Consistency Reliability and Test-Retest Reliability

Table 2: The corrected item-total correlation, alpha if deleted, and the intraclass correlation.

Item	Corrected item-total correlation	α if deleted	Intraclass correlation
Positive			
1	0.79	0.94	0.78 (0.68-0.86)
2	0.86	0.94	0.79 (0.69-0.87)
3	0.75	0.94	0.83 (0.74-0.89)
4	0.83	0.94	0.85 (0.70-0.90)
5	0.79	0.94	0.86 (0.780-.90)
6	0.77	0.94	0.79 (0.69-0.87)
7	0.77	0.94	0.78 (0.67-0.86)
8	0.85	0.94	0.77 (0.65-0.84)
9	0.69	0.94	0.82 (0.73-0.89)
Negative			
10	0.83	0.90	0.66 (0.51-0.78)
11	0.84	0.90	0.53 (0.34-0.68)
12	0.87	0.89	0.65 (0.50-0.77)
13	0.77	0.92	0.66 (0.50-0.77)

The internal consistency reliability test for the outcome expectation of exercise questionnaire shows Cronbach α value of 0.95 for both positive and negative scales. Table 2 shows that the corrected item-total correlations range from 0.77 to 0.86 while the α if deleted range from 0.89 to 0.94. Meanwhile, the intraclass correlation coefficients range from 0.53 to 0.86. The intraclass correlation for the positive items was higher than those for negative items.

4 DISCUSSION

This study aimed to assess the validity and reliability of an instrument measuring outcome expectations of exercise in Indonesian older adults. The instrument was developed by (Resnick, 2005) and for this study it was translated to the Indonesian language. The content validation index of the Indonesian version of the instrument was excellent; thus, the questionnaires' items are considered theoretically relevant and can be applied to the adult to the elderly population in Indonesia.

The Cronbach's alpha of the instrument was high, indicating that items in the instrument well correlated with each other. The finding in this study is in agreement with the finding from a study by (Lee et al., 2011) in Chinese older adults which shows Cronbach alpha of 0.85, as well as in the Western population (Resnick, 2005). Overall, these findings

support the reliability of the instrument in older adults in Western and Asian populations.

The intraclass correlation ranged from 0.53 to 0.87, which means that the test and retest reliability were acceptable to good. The results of this reliability, besides reflecting the quality of the instrument, may also be influenced by participants' condition. Participants, as older adults may experience obstacles in their cognitive process. Also, the second assessment was conducted a day before the fasting month of Ramadhan. This may affect participants' social-cognitive processes in managing their physical activities. Therefore, further research is recommended to confirm the finding.

5 CONCLUSIONS

The Indonesian translation version of the outcome expectation of exercise exhibits good content validity, excellent internal consistency reliability and test and re-test reliability. The findings, therefore, provide preliminary evidence of the reliability and validity of the use of the instrument in the Indonesian older adult population

REFERENCES

Avery, L., Flynn, D., van Wersch, A., Sniehotta, F. F. & Trenell, M. I. 2012. Changing physical activity behavior in type 2 diabetes: A systematic review and meta-analysis of behavioral interventions. *Diabetes Care,* 35, 2681-2689.

Bauman, A., Merom, D., Bull, F. C., Buchner, D. M. & Fiatarone Singh, M. A. 2016. Updating the evidence for physical activity: summative reviews of the epidemiological evidence, prevalence, and interventions to promote "active aging". *The gerontologist,* 56, S268-S280.

Darren, G. & Paul, M. 2003. *SPSS for Windows Step by Step: A simple guide and reference,* Needham Heights, MA: Allyn & Bacon.

de Labra, C., Guimaraes-Pinheiro, C., Maseda, A., Lorenzo, T. & Millán-Calenti, J. C. 2015. Effects of physical exercise interventions in frail older adults: a systematic review of randomized controlled trials. *BMC geriatrics,* 15, 154.

Haas, B. K. & Northam, S. 2010. Measuring self-efficacy: development of the Physical Activity Assessment Inventory. *Southern Online Journal of Nursing Research,* 10, 35-51.

Hale, D. & Marshall, K. 2017. Physical activity for older adults. *Home healthcare now,* 35, 172-173.

Kroll, T., Kehn, M., Ho, P.-S. & Groah, S. 2007. The SCI exercise self-efficacy scale (ESES): development and psychometric properties. *International Journal of Behavioral Nutrition and Physical Activity,* 4, 1.

Lee, L.-L., Chiu, Y.-Y., Ho, C.-C., Wu, S.-C. & Watson, R. 2011. The Chinese version of the Outcome Expectations for Exercise scale: validation study. *International journal of nursing studies,* 48, 672-680.

Nabavi, R. T. 2012. Bandura's Social Learning Theory & Social Cognitive Learning Theory.

Peyman, N. & Esmaily, H. 2013. Using of social cognitive theory: predictors of physical activity among women with diabetes type 2. *Journal of Research and Health,* 3, 345-354.

Resnick, B. 2005. Reliability and validity of the Outcome Expectations for Exercise Scale-2. *Journal of Aging and Physical Activity,* 13, 382-394.

Sallis, J. F., Owen, N. & Fisher, E. B. 2008. *Ecological models of health behavior.*

Sousa, V. D. & Rojjanasrirat, W. 2011. Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice,* 17, 268-274.