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Validation of the Malay Version of the Life Orientation Test-Revised (LOT-R) among Malaysian Cancer Patients

Abstract — It is important to study optimism as it is negatively correlated with anxiety and depressive and positively correlated with quality of life in cancer patients. This study translated and investigated the psychometric properties of the Malay version of the Life Orientation Test-Revised (LOT-R) among Malaysian cancer patients. The validated Malay version of the LOT-R will be used for assessing level of optimism among Malaysian cancer patients in future studies and determine factors associated with it in order to design effective psychosocial intervention which will enhance level of optimism in cancer patients. Concurrent translation and back translation of original English version of the LOT-R to Malay was performed and the Malay version was administered to 195 cancer patients of different cancer diagnoses at baseline assessment and repeated 2 months later at follow up. Reliability was assessed with internal consistency (Cronbach's α) and test-retest reliability (intraclass correlation coefficient), validity was assessed with face, content, convergent, and discriminant validities. Construct validity was examined with exploratory factor analysis. Two third of the participants (n = 129/195; 66%) were of middle age, three forth were females (n = 142/195; 72.8%) and eight tenth were Malays (n = 160/195; 82.1%). The LOT-R (Malay) total score (Cronbach's α = 0.58; ICC = 0.62) and its domains (Cronbach's α $_{[Optimism]}$ = 0.60; Cronbach's α$_{[Pessimism]}$ = 0.42; ICC$_{[Optimism]}$ = 0.61; ICC$_{[Pessimism]}$ = 0.59) demonstrated questionable internal consistencies but acceptable test-retest reliability. Convergent and discriminant validities were achieved by the LOT-R (Malay). Construct validity was also demonstrated by the LOT-R (Malay) as exploratory factor analysis showed that all the items had factor loadings > 0.4. The LOT-R (Malay) has acceptable psychometric properties and suitable to assess optimism in Malaysian cancer patients. It should be validated for use in other Malaysian populations.

Keywords — Life Orientation Test-Revised (Malay), Malaysian cancer patients, reliability, validity

1 INTRODUCTION

One of the commonest psychiatric sequelae associated with cancer is depression and anxiety. In a multicentre study in Canada which involved 10,153 cancer patients, across all cancer types, 19% of patients presented with clinical level of anxiety and 12.9% presented with clinical level of depression [1]. In the Asian context, a study in Iranian cancer patients reported 16.7% of patients exhibited symptomatic anxiety while 21.3% of patients presented with symptomatic depression [2]. A Malaysian study of breast cancer patients reported even higher prevalence of anxiety which affects 31.7% of patients while depression is reported in 22% of patients [3]. The focus on positive psychology in cancer patients has been of particular importance recently as positive psychology may reduce the occurrence of psychological distresses such as depression and anxiety in cancer patients and may also improve the quality of life of cancer patients.

Optimism is the stable tendency to believe good things rather bad things will happen in life [4]. There are two components in the assessment of optimism i.e. the optimism component evaluates the degree of positive expectancy of a person for their future while pessimism component assesses the degree of negative expectancy of a person for their future [4].

It is important to study optimism as evidence has shown optimism influence physical and mental well-being by promoting healthier lifestyle with better adaptive coping and cognitive responses, and greater problem solving capability. Optimism has also been shown to enhance quality of life [5]. With regard to cancer patients, optimism has been shown to be

negatively correlated with depression and anxiety in oral cancer patients [6]. In addition, optimism is also associated with and predicts better quality of life in cancer patients [7]. Finally, cancer patients with greater degree of optimism also reported less severe cancer pain [8]. Hence, it is important to study optimism and how it interacts with other possible predictors of quality of life and well-being of cancer patients.

There are several rating scales which measure the degree of optimism such as Attributional Style Questionnaire [9], Life Orientation Test-Revised (LOT-R) [4], Life Orientation Test (LOT) [10], and the Extended Life Orientation Test (ELOT) which was derived from the original Life Orientation Test [11]. But the gold standard for measuring the degree of optimism is the Life Orientation Test-Revised (LOT-R) which is the revised rating scale derived from Life Orientation Test (LOT). The original Life Orientation Test (LOT) consist of 8 items plus fillers. Half of these items were framed in optimistic manner and the other half in pessimistic manner, and the responders extend their agreement or disagreement in a multipoint scale for each item. It has good psychometric properties but was criticized because the optimistic and pessimistic item sets form two (2) factors that are not always interrelated.

Thus, Life Orientation Test-Revised (LOT-R) was introduced which is more brief (6 coded items with 3 framed in each direction). The revision omitted or rewrote items that did not focus on explicit expectations. The positive and negative subsets are more strongly related to each other than those in LOT. The LOT-R is a self-administered scale consisting of 6 items with 2 domains (optimism and pessimism). It has acceptable internal consistency (Cronbach's α = 0.78). Its test-retest reliability ranged from 0.60 to 0.79 over an interval of 4 to 28 months [4]. It has been translated and validated in Greek, Italian, Portuguese, French and Spanish [12, 13, 14, 15, 16].

This study aimed to translate and investigate the psychometric properties of the Malay version the Life Orientation Test-Revised (LOT-R) among Malaysian cancer patients. The validated Malay version of the LOT-R will be used for assessing level of optimism among Malaysian cancer patients in future studies and determine factors associated with it in order to design effective psychosocial intervention which will enhance level of optimism in cancer patients.

2 METHODS

2.1 Participants

This study was approved by the Human Ethics Committee of Universiti Sains Malaysia and conducted for a duration of 2 years. We recruited cancer patients who visited Oncology out-patient clinic and in-patient ward of Advanced Medical and Dental Institute, Universiti Sains Malaysia from 2015-2016. Patients were approached and explained about the study, and those who fulfilled all inclusion criteria were invited to sign the informed consent form and then enrolled in the study. The inclusion criteria were patients of any cancer diagnoses confirmed by histopathological report except brain tumour, married, 18 years and above, able to read and write in the Malay language, and physically able to answer questionnaires. Participants will answer the Malay version of the Life Orientation Test-Revised (LOT-R) and the Malay version of the Snyder's Hope Scale (as comparison to assess discriminant validity of LOT-R) during baseline assessment and then the LOT-R (Malay) was re-administered 2 months after baseline assessment during follow up assessment.

2.2 Measures

Life Orientation Test-Revised (LOT-R) is a self-rated 6-item scale which was adapted from the original 8-item Life Orientation Test (LOT) in which it measures the responder's level of optimism (defined as stable tendency to have faith that more good than bad will happen). It consists of 2 domains which are optimism with 3 items (Items 1, 3 and 6) and pessimism which also consists of 3 items (Items 2, 4 and 5). Each item is scored in a 5-point Likert scale ranged from 0 (Strongly disagree) to 4 (Strongly agree). The total score ranged from 0 to 24 [4].

Snyder's Hope Scale is a self-rated 12-item scale which assesses the responder's level of hope. It comprised of 2 domains such as agency and pathway. 4 items assessed agency, another 4 items assessed pathway while the remaining 4 items act as fillers. A 4-point Likert scale is used to score each item ranged from 1 (Strongly disagree) to 4 (Strongly agree). Total Hope Scale score ranged from 12 to 48 [17]. The Malay version of Snyder's Hope Scale was validated in Malaysian cancer patients with acceptable internal consistency (Cronbach's α) of 0.72 and test-retest reliability (intraclass correlation coefficient) of 0.67. Confirmatory factor analysis

shown that it best fit into a 2-factor model similar to the original English version [18].

2.3 Translation and back translation

The original English version of the LOT-R was translated by a bilingual language expert from Language and Literacy Center of Universiti Sains Malaysia into Malay language and then back translated by another bilingual language expert who has never seen the original version. Then, the translated and back translated versions were reviewed by a group of content experts which involved two psychiatrists and a clinical psychologist before the drafted Malay version of the LOT-R [LOT-R (Malay)] was constructed. Then, the LOT-R (Malay) draft was pre-tested in 20 Malaysian cancer patients who were native speakers of Malay to evaluate the wordings and sentence structure, semantic quality, comprehension and suitability of administration time in order to ensure face validity. If there was any unacceptable wordings and sentences, the drafts were re-examined by the team of experts before the final draft was constructed.

2.4 Data analysis

Data analysis was performed with IBM SPSS version 22 in which reliability was assessed with internal consistency measured by Cronbach's α and test-retest reliability measured by intraclass correlation coefficient (ICC). Convergent validity was assessed by examining the Pearson's correlation coefficient of individual items with their designated and non-designated domains in the LOT-R (Malay). Discriminant validity was assessed by evaluating the Pearson's correlation coefficient of the domains of the LOT-R (Malay) with the domains of the Snyder's Hope Scale (Malay). Construct validity was evaluated by exploratory factor analysis with orthogonal Varimax rotation with Kaiser normalization for the Malay version of the LOT-R with acceptable factor loading set at > 0.4.

3 RESULTS

The final sample size of this study was 195 patients. Two third of participants were of middle age (66% of participants aged 46-59 years old), followed by younger age (27% of participants aged 25-45 years old) and only a small proportion of participants were above 65 years old (7%). In addition, three fourth were females (72.8%) and most were Malays (82.1%).

The pilot study which assessed face validity revealed that 76% of patients commented that the wordings, sentence structure and semantic quality of the LOT-R (Malay) was appropriate and 24% commented they were most appropriate. Regarding the comprehension and meaning of the items in the questionnaire, 70% of participants commented these were appropriate and 30% commented most appropriate. Finally, 70% of participants commented the time of administration of the questionnaire was appropriate and 30% commented most appropriate. They took 5 minutes to answer the LOT-R (Malay). Hence, there was no need to make amendments to the questionnaire after completion of the pilot study.

In the assessment of internal consistency, the Cronbach's α of the total LOT-R (Malay) score was 0.58. The Cronbach's α of the domains of the LOT-R (Malay) were 0.6 for optimism and 0.42 for pessimism. In the evaluation of test-retest reliability, the ICC of the total LOT-R (Malay) score was 0.62 (p < 0.05) and that of its domains were 0.61 (p < 0.05) for optimism and 0.59 (p < 0.05) for pessimism. The results were summarized in Table I.

Pearson's correlation coefficient demonstrated that all the items of LOT-R (Malay) were highly correlated with their designated domains (r_s ranged from 0.63 to 0.78) and their correlations with other domains were low (r_s ranged from -0.11 to 0.23). The findings were summarized in Table II.

Table I. Reliability of the LOT-R (Malay)

	Baseline Mean (SD)	Follow up Mean (SD)	Internal consistency (Cronbach`s α)	Test-retest reliability (ICC)
LOT-R (Malay):				
Optimism	10.41(±1.55)	10.42(±1.44)	0.60	0.61*
Pessimism	5.62(±1.7)	5.12(±1.6)	0.42	0.59*
Total	16.04(±2.7)	15.54(±2.6)	0.58	0.62*

* p < 0.05 as statistically significant

Table II. Pearson's correlation coefficient within the LOT-R (Malay) (item vs. domain)

LOT-R (Malay)	Optimism	Pessimism
Item 1 (In uncertain times, I always expect the best.) [Pada masa yang tidak menentu, saya sentiasa mengharapkan yang terbaik.]	**0.63***	0.07
Item 3 (I'm always optimistic about my future.) [Saya sentiasa berfikiran positif tentang masa depan saya.]	**0.66***	0.19
Item 6 (Overall, I expect more good things to happen to me than bad.) [Secara keseluruhan, saya menjangkakan lebih banyak perkara yang baik akan berlaku pada saya, daripada perkara buruk.]	**0.78***	0.08
Item 2 (If something can go wrong for me, it will.) [Jika sesuatu yang buruk boleh berlaku pada saya, ia akan berlaku.]	0.23	**0.70***
Item 4 (I hardly ever expect things to go my way) [Saya langsung tidak menjangkakan perkara yang baik akan berlaku kepada saya.]	0.22	**0.71***
Item 5 (I rarely count on good things happening to me.) [Saya jarang menjangkakan perkara yang baik akan berlaku kepada saya.]	-0.11	**0.63***

* $p < 0.05$ indicating statistical significance

When comparing the Pearson's correlation coefficient between the domains of the Snyder's Hope Scale (Malay) with domains of the LOT-R (Malay), the domains were not correlated except pathway and agency domains of the Snyder's Hope Scale (Malay) which was weakly correlated with optimism domain of the LOT-R (Malay) ($r_s = 0.28$, $p < 0.05$ and $r_s = 0.29$, $p < 0.05$ respectively). The results were summarized in Table III.

Table III. Pearson's correlation coefficient between domains of the Snyder's Hope Scale (Malay) with domains of the LOT-R (Malay)

	Pathway [Hope Scale (Malay)]	Agency [Hope Scale (Malay)]
Optimism [LOT-R (Malay)]	0.28*	0.29*
Pessimism [LOT-R (Malay)]	-0.03	-0.13

* $p < 0.05$ indicating statistical significance

Exploratory factor analysis with orthogonal Varimax rotation with Kaiser normalization of the LOT-R (Malay) demonstrated that all items in optimism domain had loading factors ranged from 0.65 to 0.74 and the loading factors of all items in pessimism domain ranged from 0.52 to 0.82. Kaiser-Meyer-Olkin measure of sample adequacy was 0.64 and Bartlett's test of sphericity was significant ($p < 0.001$) and hence the scale was valid. Findings summarized in Table IV.

Table IV. Exploratory factor analysis with orthogonal Varimax rotation with Kaiser normalization of the LOT-R (Malay)

LOT-R (Malay):	Optimism	Pessimism
Item 1	0.74	
Item 3	0.65	
Item6	0.71	
Item 2		0.60
Item 4		0.82
Item 5		0.52

4 DISCUSSION

This study successfully translated the original English version of the Life Orientation Test-Revised (LOT-R) into the Malay language and investigated the reliability and validity of the Malay version of the LOT-R [LOT-R (Malay)].

Assessment of internal consistency and test-retest reliability of the LOT-R (Malay) indicated that this scale had acceptable reliability. The internal consistencies of the LOT-R (Malay) total score (Cronbach's $\alpha = 0.58$) and its domains (Cronbach's $\alpha_{[Optimism]} = 0.60$; Cronbach's $\alpha_{[Pessimism]} = 0.42$) were questionable [19]. But its test-retest reliability were between fair to good ($ICC_{[Total]} = 0.62$; $ICC_{[Optimism]} = 0.61$; $ICC_{[Pessimism]} = 0.59$) [20].

Face and content validities were achieved as the LOT-R (Malay) was constructed with translation and back translation by language experts and then reviewed by a team of experts (two psychiatrists and a clinical psychologist) for its contents and then followed by the pilot study with 20 Malaysian cancer patients. In the pilot study, all the patients commented that the comprehension, semantic quality, wording and sentence structures, and time of administration were appropriate and most appropriate.

Convergent validity of the LOT-R (Malay) was also demonstrated by higher correlations between all the items with their designated domains (items 1, 3 and 6 highly correlated to optimism, and items 2, 4 and 5 highly correlated

to pessimism) compared to their correlations with non-designated domains (Table II).

Optimism domain of the LOT-R (Malay) only showed weak positive correlations with both domains of the Hope Scale (Malay) but there were no significant correlations between pessimism domain of the LOT-R (Malay) with both domains of the Hope Scale (Malay). This indicate discriminant validity of the Hope Scale (Malay) and the LOT-R (Malay) (Table III).

Finally, with respect to construct validity, exploratory factor analysis with orthogonal Varimax rotation demonstrated all the items of the LOT-R (Malay) had factor loading of > 0.4 with their designated domains (items 1, 3 and 6 to optimism domain, and items 2, 4 and 5 to pessimism domain) and two factors were extracted in the LOT-R (Malay) which were similar to the original English version [4]. Hence, we conclude that construct validity was well demonstrated by the LOT-R (Malay).

The findings of this study should be critically interpreted taking into account two limitations. First, the sample size of this study was relatively small as compared to the sample size of the original English version and a translated version of the LOT-R [4, 12]. In addition, the internal consistencies of the LOT-R (Malay) and its domains were questionable but test-retest reliability were fair to good. One possible explanation for the questionable internal consistency of the LOT-R (Malay) could be due to direct translation of the items in the original LOT-R into the Malay language word by word in which this may deviate from the meaning of the items in the original English version. This limitation is particularly more obvious in the items of the pessimism component of the LOT-R (Malay) which exhibited the lowest internal consistency. Hence, we recommend future studies to use wordings which more precisely describe the meaning of the items in the questionnaire when translating the original English version into Malay language rather than word by word translation. Despite these limitations, the LOT-R (Malay) demonstrated acceptable psychometric properties and can be used to assess degree of optimism in Malaysian cancer patients.

CONFLICTS OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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