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Comprehensive Psychiatry 55 (2014) S107–S113

COMPREHENSIVE PSYCHIATRY

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Psychometric properties and validation of the Reasons for Living Inventory in an outpatient clinical population in Malaysia

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Abstract

The Reasons For Living Inventory has been shown to have good psychometric properties in Western populations for the past three decades. The present study examined the psychometric properties and factor structure of English and Malay version of the Reasons For Living (RFL) Inventory in a sample of clinical outpatients in Malaysia. The RFL is designed to assess an individual's various reasons for not committing suicide. A total of 483 participants (283 with psychiatric illnesses and 200 with non-psychiatric medical illnesses) completed the RFL and other self-report instruments. Results of the EFA (exploratory factor analysis) and CFA (confirmatory factor analysis) supported the fit for the six-factor oblique model as the best-fitting model. The internal consistency of the RFL was $\alpha = .94$ and it was found to be high with good concurrent, criterion and discriminative validities. Thus, the RFL is a reliable and valid instrument to measure the various reasons for not committing suicide among psychiatry and medical outpatients in Malaysia.

1. Introduction

Suicide is a major public health problem worldwide and is recognized as one of the three leading causes of death among those aged 15–44 years in some countries [1]. In Malaysia, suicidal behavior is a growing cause for concern since suicide rates have increased up to 60% in the past 45 years [2]. It was reported by the Malaysian Psychiatric Association [2] that approximately seven people commit suicide daily in this country. Meanwhile, admissions and death in government hospitals in Malaysia due to suicide attempts were reported to be at constant rise from the year 1999 to 2007. The report by the National Suicide Registry [3], showed that the cases of completed suicide from July to December, 2007 were 113, with 73 men and 31 women. The majority were the Chinese (43%) followed by Indians (29%) and Malays (11%).

Much research effort has focused on identifying suicide risk factors, which increase the chances of an individual engaging in self-destructive behavior. Consistent with this growing interest, several self-report measures have been developed and validated for identifying these factors such as the Suicide Probability Scale [4]. However, less attention has been given by researchers to the role of buffering or protective factors against suicidal behavior. In view of this concern, Linehan and colleagues [5] developed the Reasons for Living Inventory (RFL), which has 48 items with specific reasons for an individual for not committing suicide. The RFL was developed based on a cognitive–behavioral model to examine the cognitive factors, which act as a buffer against suicidal behavior. A total of six subscales were selected based on four separate factor analyses which were carried out on two samples of normal adult subjects: suicidal and coping belief (SCB), responsibility to family (RF), child-related concerns (CC), fear of suicide (FS), fear of social disapproval (FSD) and moral objections (MO). Each item of this inventory is rated at six levels of importance ranging from 1 (not at all important) to 6 (extremely important).

Studies investigating the psychometric properties of the RFL inventory have been conducted in different populations. Cole [6] reported initial normative data using a modified version of the RFL on 285 high school and 79 delinquent adolescents. Osman et al. [7] reported the internal consistency for the RFL, which was satisfactory based on a sample of 110 undergraduates. Factor analytic studies [8,9] among

Publication of this supplement was supported by Universiti Kebangsaan Malaysian Medical Centre, Kuala Lumpur, Malaysia.
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http://dx.doi.org/10.1016/j.comppsych.2013.06.010

college students and adult psychiatric inpatients identified five and six factors respectively. However, only exploratory factor analysis was performed in both these studies. In a sample of 205 long-term care psychiatric inpatients using confirmatory factor analysis, six original factors with high coefficient alphas (.93) were identified by Linehan et al. [5].

According to Malaysian Psychiatric Association (2004), approximately 7% to 10% of depressed patients are expected to be at risk of suicide in the next 10 to 15 years. So it is important to validate RFL in Malaysia especially among this population in order to conduct reliable studies on suicide behavior in Malaysia. Questionnaires originally developed in one cultural setting cannot automatically be applied in another culture. They have to be tested and validated for their psychometric properties. To date, there is only a single study on suicide risk in this population in Malaysia [10]. However RFL was not used and the scales to measure suicidal ideation and depression were not validated in this study. A validated scale in a specific population and diversified culture like Malaysia will be very useful as a reliable measure to be used in this specific population in future. Thus, the main aims of the present study were to (a) examine the factor structure and psychometric properties of RFL in a sample of clinical patients in Malaysia, (b) examine the relation between the RFL with other measures of suicide behavior and general psychopathology, and (c) provide evidence of the psychometric properties of this scale so that it may be used with confidence in a Malaysian clinical population.

2. Method

2.1. Participants

The data for this study are part of a research program looking at risk and protective factors among anxiety and mood disorder patients in Malaysia. Participants were recruited from Universiti Kebangsaan Malaysia Medical Centre (UKMMC) and a total of 483 psychiatric and medical outpatients participated in this study. UKMMC is a semi-government hospital, which is located in Cheras, Kuala Lumpur and it is also the teaching hospital for the Universiti Kebangsaan Malaysia and a national tertiary hospital. UKMMC receives referral cases from district hospital, government primary health clinic and private clinic from all over Malaysia. Participants included in this study aged between 18 and 76 years with the diagnosis of depressive disorders, anxiety disorders or co-morbid anxiety and mood disorders as defined by the DSM-IV and who gave written consent. Patients, who were too psychotic or ill to be interviewed, did not give written consent or could not comprehend in Bahasa Malaysia or English were excluded from the study.

The 283 psychiatric patients consisted of 203 (42.0%) patients diagnosed with some form of mood disorders, 65 (13.4%) with anxiety disorders, 15 (3.1%) co-morbid anxiety and mood disorders. The remaining 200 medical patients were outpatients coming to hospital for medical illnesses.

2.2. Measures

Participants were asked to complete a brief demographic questionnaire, the Reasons For Living Inventory and seven other self-report instruments; The Depression Anxiety Stress Scale-21, Satisfaction With Life Scale, Beck Hopelessness Scale, Rosenberg Self-Esteem Scale, Positive and Negative Suicide Ideation Inventory, Provision of Social Relations and The Adult Trait Hope Scale.

2.3. Procedure

2.3.1. Psychiatry and medical patient samples

For the psychiatry sample, all outpatients with any diagnosis of mood disorders and/or anxiety disorders whom were either follow-up, new or emergency cases within the study period were invited to take part in this study. Meanwhile medical patients were recruited from those attending any of the following clinics: medical, ear, nose and throat (ENT), ophthalmology and orthopedic outpatients. The patients were explained about the study and informed consent was obtained from those who agreed to participate. Then, they would proceed to answering the questionnaires described above which took approximately 45 minutes to complete.

For both psychiatry and medical samples, the first author administered The Mini International Neuropsychiatric interview (MINI) [11] for every 10 patients recruited which aimed to ascertain the diagnosis given by their psychiatrist for the former and exclude the psychiatric diagnosis in the latter. The percentage of agreement was 81.9% for patients with mood disorders and 100% for both patients with anxiety disorders and patients with the diagnosis of co-morbid mood and anxiety disorders groups with a kappa value of 0.784.

2.3.2. Translating and back-translating procedure

Two bilingual psychiatry registrars and two clinical psychologists with a master's degree translated the English version of all the instruments using the back-translating procedures. Subsequently, the questionnaires were proofread by a professional language interpreter to identify and reconcile any language discrepancy derived from the translation procedure.

2.4. Ethical approval

The study received ethical approval from the research ethic committees of Universiti Kebangsaan Malaysia Medical Centre (Project Code: FF-251-2010) and Behavioral & Social Sciences Ethical Review Committee of University of Queensland (Project No: 2010001093). Every patient gave his/her informed consent for this study.

2.5. Data analysis

The data were analyzed using the Statistical Program Social Sciences version 15.0 and AMOS version 20.0 software. Data were first screened using the descriptive statistics, followed by the analyses as below:

i. Cronbach's alpha coefficients were obtained to measure the reliability of RFL.
ii. Correlations with logistic regression analysis were determined to obtain the concurrent validity of RFL.
iii. The Kaiser–Meyer Oklin (KMO) value and correlation matrix were obtained to determine the suitability of data for factor analysis with a KMO value of 0.7–0.8 and above is taken as suitable.
iv. Exploratory Factor Analysis (EFA) was used to examine the factor structures of RFL.
v. Confirmatory Factor Analysis (CFA) was used to determine the model fit. An acceptable model is indicated by a value of SB-χ^2/df (chi-square divided by its degrees of freedom) of <3. Alternatively, indices such as Adjusted-Goodness-of-Fit Index (AGFI) with a value of >0.90 and the Root Mean Square Error Approximation Index (RMSEA) with a value of <0.08 are also indicative of acceptable fit [12].

3. Results

Table 1 shows the descriptive analyses of diagnosis, gender, race, age and marital status of the sample. In addition, 65 (27.7%) patients with psychiatry illnesses and 3 (1.5%) patients without psychiatry illnesses were identified to have history of suicide attempts in this study.

3.1. Exploratory factor analysis

For the EFA, it was decided to use the sample size of 168 for the 48-itemed RFL. In order to conduct factor analysis, a total number of 150 cases should be sufficient if solutions have high loading marker variables, which are above .80 [13].

Table 1
Descriptive analyses of the sample.

Demographic characteristics	*N* (%)
Diagnosis	Mood disorders: 203 (42%)
	Anxiety disorders: 65 (13.4%)
	Co-morbid anxiety and mood disorders: 15 (3.1%)
	Medical patients: 200 (41.4%)
Gender	Male: 188 (38.9%)
	Female: 295 (61.1%)
Race	Malays: 258 (53.4%)
	Chinese: 157 (32.5%),
	Indians: 53 (11%)
	Other races: 15 (3.1%).
Age	16 to 75 years, with a mean of 42 years
Marital status	Singles: 127 (26.2%)
	Married: 300 (62.1%)
	Divorced: 27 (5.6%)
	Widowed: 8 (1.6%)
	Separated: 7 (1.5%)
	Without the marital status: 14 (3%)

Correlation matrix showed the presence of many coefficients of .4 and above. The Keiser–Meyer–Olkin value was .889 exceeding the recommended value of .6 [14] indicating sampling adequacy. The significant value (1 < .001) of Barlett's Test of Sphericity also supported the factorability of the correlation matrix and the data were decided to be suitable for factor analysis. The most appropriate number of factors to retain was based on several criteria:

(a) minimum of 1 as the value of eigenvalue
(b) minimum of 0.40 as the factor loadings
(c) minimal multiple loading, and
(d) meaningful interpretation of factors

The EFA results are summarized in Table 2, where the six component solution was explained by a total of 55.9% of the

Table 2
Pattern matrix of exploratory factor analysis for Reasons for Living Inventory.

Item no.	SCB	RF	MO	FS	CC	FSD	Communalities
24	.80						.72
32	.76						.74
35	.76						.76
36	.75						.62
22	.74						.66
44	.72						.60
12	.70						.58
13	.70						.67
19	.69						.58
4	.68						.69
20	.68						.57
42	.68						.69
40	.63						.53
2	.61						.76
37	.61						.55
14	.59						.56
3	.56						.60
17	.54						.49
9		.58					.40
16		.53					.69
27			.82				.67
5			.70				.61
23			.67				.59
34			.67				.61
33				.71			.60
46				.67			.63
18				.43			.27
26				.57			.55
38				.56			.76
21					.76		.56
28					.72		.72
11					.62		.61
31						.74	.63
41						.71	.65
43						.61	.56
Eigenvalues	16.27	3.21	2.24	1.94	1.68	1.52	
Percent of variance	33.9	6.7	4.7	4.0	3.5	3.2	
			35 items (55.96)				

Suicidal and coping beliefs (SCB), Responsibility to family (RF), Child-related concerns (CC), Fear of suicide (FS), Fear of social disapproval (FSD), Moral objections (MO).

variance with factor 1 (SCB) contributing 33.9%, factor 2 (RF) contributing 6.7%, factor 3 (MO) contributing 4.7%, factor 4 (FS) contributing 4.1%, factor 5 (CC) contributing 3.5% and factor 6 (FSD) contributing 3.2%. When rotation was performed, 35 items instead of 48 items loaded into the six respective factors (suicidal and coping belief, responsibility to family, child-related concerns, fear of suicide, fear of social disapproval and moral objections) as found by Linehan and colleagues [5].

3.2. Confirmatory factor analysis

Three hundred fifteen patients from the remaining total sample were used for confirmatory factor analysis for RFL. Using the 35 items representing six latent variables, the model did not fit well. However after allowing correlations between three sets of error terms (e6 and e10), (e36 and e40) and (e21 and e22) within the RFL factor, a good fit of the model to the data was obtained (χ^2 = 1196.74, df = 542, SB-χ^2/df = 2.208, p = .000, GFI = .923, CFI = .977, RMSEA = .062 (see Fig. 1). The correlation between (e6 and e10), (e36 and e40) and (e21 and e22) was significant ($p < .01$).

3.3. Reliability analysis of the RFL scales

The internal consistency of the RFL in the total sample (n = 483), the Cronbach's alpha coefficient for the RFL was .94. This indicated adequate internal consistency based on the suggested criterion level for a coefficient's alpha of .70 and above by Nunnally and Bernstein [15] in 1994. The inter-item correlations ranged from 0.32 to 0.73 and this indicated that there was a lack of multicollinearity since the value was below 0.80 [15].

3.4. Concurrent validity

Pearson correlation was used to evaluate the concurrent validity. The descriptions of the scales and their intercorrelations are shown in Table 3. When a high correlation is obtained between measures of similar constructs, it indicates good concurrent validity. Protective factors for suicidal behavior in this study were measured using PANSI-positive, RSE, ATH, PSR and SWL. Meanwhile scales measuring risk factor include PANSI-Negative, BHS and DASS. The results revealed a significant positive correlation between RFL total score with measure of protective factors, PANSI-Positive, RSE, ATH, PSR and SWL. Meanwhile a significant negative correlation was found between RFL total score with measure of risk factors, DASS, BHS and PANSI-Negative. This showed that the RFL has good concurrent validity.

3.5. Discriminative validity

Logistic regression analyses were used to evaluate the contribution of RFL in differentiating between patients who attempted suicide and patients who did not attempt suicide. In comparison between patients who attempted suicide and patients who did not attempt suicide, scores of RFL (estimate = −.024, $p < .05$, OR = 0.977, 95% CI = 0.97, 0.99) (see Table 4) were significantly different between the two groups. The RFL was able to differentiate those who attempted suicide from those who did not, with an overall classification accuracy estimate of 83.2%.

3.6. Criterion validity

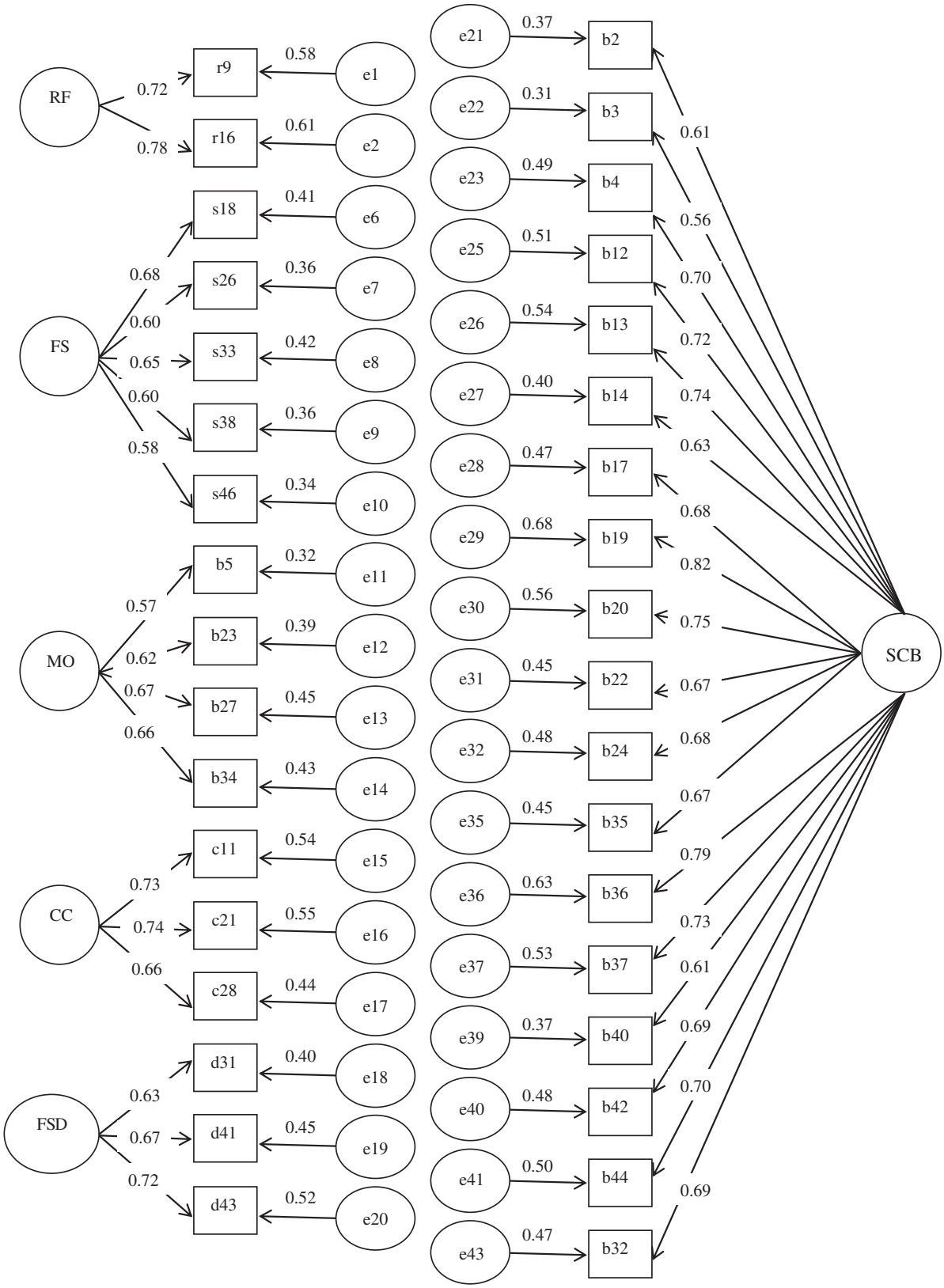
Table 5 shows that medical patients showed significantly higher mean scores on the RFL than psychiatric patients.

4. Discussion

From our findings the RFL Inventory appears to be a valid instrument for use in Malaysian clinical settings. The exploratory factor analysis (EFA) suggested six (suicidal and coping belief, responsibility to family, child-related concerns, fear of suicide, fear of social disapproval and moral objections) structures retaining 35 of 48 original items suggested by Linehan and colleagues [5]. The six factors collectively explain 55.96% of variance in reasons for living. The CFA further confirmed the six-factor model.

The total 35 items of the six factors above loaded on the original respective factors, however the total items in three factors ("Survival and coping beliefs," "Fear of suicide," "Responsibility to Family") were less than that suggested by Linehan et al. [5]. Eighteen items loaded on the "Survival and Coping Beliefs" factor leaving six items ("I do not believe that things get miserable or hopeless enough that I would rather be dead," I do not want to die," "I am too stable to kill myself," "I am curious about what will happen in the future," "I believe killing myself would not really accomplish or solve anything," "I see no reason to hurry death along") not loading into any of the original six factors. For the factor "Responsibility to family" only two items loaded with five items not loading into any factors ("I have a responsibility and commitment to my family," "My family might believe I did not love them," "It would hurt my family too much and I would not want them to suffer," "I would not want my family to feel guilty afterwards," "I would not want my family to think I was selfish or a coward"). Finally two items ("I am afraid of death," "I have great faith in the future") of "Fear of suicide" factor did not load into any factors.

The cultural factors could be one of the reasons for some of the items in RFL not loading into any factors among this population. It is worth noting that being dead or dying was not part of the survival and coping beliefs among participants in this study. The Malays, Chinese and Indians in Malaysia differ widely in their religious affiliation and cultural background. The Malays who are Muslims consider committing suicide a serious sin. They believe that if they were to commit suicide, they will be placed in hell and talking about committing suicide is uncommon in this culture. The participants would have felt uncomfortable answering certain questions on suicidal behavior since it is



Notes :
Suicidal and coping beliefs (SCB), Responsibility to family (RF), Child-related concerns (CC), Fear of suicide (FS), Fear of social disapproval (FSD), Moral objections (MO)

Fig. 1. Standardized regression weight for items in RFL.

Table 3
Intercorrelations for RFL subscales with PANSI-Negative, PANSI-Positive, RSE, AHT, PSR, SWLS, BHS, DASS, SCB, RF, MO, FS, CC and FSD.

Variables	PANPO	PANNEG	RSE	AHT	PSR	SWLS	BHS	DASS	SCB	RF	MO	FS	CC	FSD
RFL	.42**	−.36**	.34**	.43**	.33**	.39**	−.41**	−.35**	.41**	.36**	.33**	.42 **	.34**	.51

Pearson correlation coefficient.
RFL, Reasons For Living Inventory; RSE, Rosenberg Self-Esteem Scale; AHT, The Adult Trait Hope Scale; PSR, Provision of Social Relations; SWL, Satisfaction With Life Scale; PANPO, Positive And Negative Suicide Ideation Inventory (PANSI-Positive); PANNEG, Positive And Negative Suicide Ideation Inventory (PANSI-Negative); BHS, Beck Hopelessness Scale; DASS, The Depression Anxiety Stress Scale; SCB, Suicidal and coping beliefs; RF, Responsibility to family; CC, Child-related concerns; FS, Fear of suicide; FSD, Fear of social disapproval; MO, Moral objections.
** $p < .001$.

against their religious belief. The Muslims also believe in "Qada" and 'Qadar" whereby whatever happens in ones' life is decided by the Almighty and an individual should surrender to "Allah." They are not supposed to question problems given to them in their lives and should leave everything to God. Even though currently suicide rates are highest among the Chinese in Malaysia but it appears that they still do not consider being dead as a method of survival and not part of their coping beliefs. The Chinese in Malaysia mainly originated from Mainland China and believe in working hard in solving problems and facing life. Meanwhile, suicidal behavior among the Indians used to be the highest compared to other races and ending ones life was the ultimate solution for problems. However, this is not the scenario in this study. Even though the population of this study consists of psychiatry patients yet interestingly suicidal behaviors were not part of their coping and surviving mechanism.

The RFL proved to have sufficient internal consistency ($\alpha = .94$). Logistic regression showed that RFL had good discriminative validity. RFL as the protective measures was able to differentiate patients with suicide attempts from those who did not make such attempts. In addition, RFL had good criterion validity whereby the mean score of RFL was found to be significantly higher among medical patients compared to psychiatric patients. This finding is consistent with findings from Osman et al. [16], which showed RFL as the useful instrument in differentiating between suicide attempters and psychiatric control groups. The results of the present study further verified the concurrent validity of RFL with significant positive correlation between RFL total score with measure of protective factors, PANSI-Positive, RSE, ATH, PSR, SWL and a significant negative correlation was found between RFL total score with measure of risk factors, DASS, BHS and PANSI-Negative.

This is one of the first studies to validate the RFL for use in a country with culturally different population. This study provides clear evidence that the RFL is reliable and a valid measure to assess an individual's various reasons for not committing suicide. The major strengths of the present study included the use of EFA and CFA methodology and the direct application of a theoretically derived measure to a clinical setting and a specific sample.

In conclusion, the 35-item RFL appears to be a sound measure of protective factors related to outpatient suicide-related behaviors and it is comparable to other self-report measures. The RFL may be used with confidence among medical and psychiatric outpatients. In addition, RFL can be used confidently in research on suicidal behavior and also by clinicians among patients in the treatment of suicidal behavior.

We would like (1) to thank the Government of Malaysia and the Universiti of Kebangsaan Malaysia for providing a scholarship to Aishvarya Sinniah to complete her PhD degree at the University of Queensland, Australia; (2) to express extreme gratitude to the patients who volunteered to participate in this study; (3) to note that Dr. Oei is an Emeritus Professor at the University Of Queensland, Australia (he was also a visiting professor at Beijing Normal University in China and at James Cook University in Singapore); and (4) to thank the staffs of the Department of Psychiatry, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Malaysia and School of Psychology at University of Queensland, Australia for the help and support.

Acknowledgment

Dr Oei is now an Emeritus Professor of UQ and a visiting professor (part time) at James Cook University, Singapore and at Beijing Normal University, PR China.

Table 4
Discriminant analyses of RFL.

	B	S.E.	Wald	*df*	Sig.	Exp(*B*)	95.0% CI for Exp(*B*)	
							Lower	Upper
TRFL	−.024	.004	31.252	1	.001	.977	.969	.985

RFL, Reasons for Living Inventory; TRFL, Total Reasons for Living Inventory; *df*, degree of freedom; Sig., significance probability; S.E., standard error; 95% CI, 95% confidence interval.

Table 5
Mean and standard deviation of RFL for psychiatric and medical patients.

	Psychiatric patients, mean ± SD	Medical patients, mean ± SD
Reasons For Living Inventory	161.18 ± 31.4	174.51 ± 26.2**

RFL, Reasons For Living Inventory; SD, standard deviation.
** $p < .001$.

References

[1] World Health Organization. Suicide prevention (SUPRE). Geneva: World Health Organization; 2012 http://www.who.int/mental_health/prevention/suicide,suicideprevent/en/.

[2] Malaysian Psychiatric Association. Suicide—it's SOS. Retrieved on 29 October 2009 and from http://www.psychiatry-malaysia.org/article.php?aid=5042007.

[3] National Suicide Registry Malaysia, NRSM. Kuala Lumpur, Malaysia. 2008.

[4] Cull JG, Gill WS. Suicide Probability Scale. Western Psychological Services: Los Angeles, CA; 1982.

[5] Linehan MM, Goodstein JL, Nielsen SL, Chiles JA. Reasons for staying alive when you are thinking of killing yourself: the Reasons for Living Inventory. J Consult Clin Psychol 1983;51(2):276-86.

[6] Cole DA. Validation of the Reasons for Living Inventory in general and delinquent adolescents samples. J Abnorm Child Psychol 1989;17(1):13-27.

[7] Osman A, Jones K, Osman JR. The Reasons for Living Inventory: psychometric properties. Psychol Rep 1991;69(1):271-8.

[8] Osman A, Gregg CL, Osman JR, Jones K. Factor structure and reliability of the Reasons for Living Inventory. Psychol Rep 1992;70(1):107-12.

[9] Osman A, Gifford J, Jones T, Lick L, Osman J, Wnnzel R. Psychometric evaluation of the Reasons for Living Inventory. Psychol Assess 1993;5:154-8.

[10] Chan LF, Maniam T, Shamsul AZ. Suicide attempts among depressed inpatient with depressive disorder in Malaysian sample. Crisis 2011;32(5):283-7.

[11] Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The M.I.N.I. (Mini International Neuropsychiatric Interview). Clinical Psychiatry 1998;59(20):22-33.

[12] Browne MW, Cudeck R. Alternative ways of assessing model fit. Sociological Methods and Research 1993;21:230-58.

[13] Tabachnick BG, Fidell LS. Using multivariate statistics, 5th ed. Boston, MA: Ally & Bacon; 2007.

[14] Kaiser H. A second generation Little Jiffy. Psychometrika 1970;39:31-6.

[15] Nunnally JC, Bernstein IH. Psychometric theory. New York: McGraw-Hill; 1994.

[16] Osman A, Linehan M, Barrios FX, Gutierrez P, Bagge CL. Validation of the Adult Suicidal Ideation Questionnaire and the Reasons for Living Inventory in an adult psychiatric inpatient sample. Psychol Assess 1999;2:115-23.