

# Psychometric properties of the Malay version of motivation scales in drug treatment

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## ABSTRACT

**Introduction:** In recognition of the role of motivation in drug use treatment, patient motivational screening instruments are needed for strategic planning and treatment. The aims of this study were to evaluate the reliability and validity of the Malay version of the Treatment Motivation Scale, and to compare the motivational levels of patients receiving substance abuse treatment with different modalities (inpatient vs. outpatient). The motivational scale consists of three scales: problem recognition, desire for help and treatment readiness.

**Method:** A convenience sample of 102 patients was recruited from four Cure and Care Service Centres in Malaysia.

**Results:** Principal component analysis with varimax rotation supported two-factor solutions for each subscale: problem recognition, desire for help and treatment readiness, which accounted for 63.5%, 62.7% and 49.1% of the variances, respectively. The Cronbach's alpha coefficients were acceptable for the overall measures (24 items;  $\alpha = 0.89$ ), the problem recognition scale (10 items;  $\alpha = 0.89$ ), desire for help (6 items;  $\alpha = 0.64$ ) and treatment readiness scale (8 items;  $\alpha = 0.60$ ). The results also indicated significant motivational differences for different modalities, with inpatients having significantly higher motivational scores in each scale compared to outpatients.

**Conclusion:** The present study pointed towards the favourable psychometric properties of a motivation for treatment scale, which can be a useful instrument for clinical applications of drug use changes and treatment.

## KEY WORDS:

*Drug; psychometric; Malaysia*

## INTRODUCTION

Drug abuse is and remains one of the leading health and social challenges in Malaysia,<sup>1-4</sup> and is regarded as a threat to national security.<sup>5</sup> Despite the implementation of various aggressive programmes and policies by the Malaysian government to tackle the drug issue,<sup>6</sup> there has been much concern about the lack of efficacy and the failure of drug-treatment programmes.<sup>2,4</sup> Given that drug related treatments are often intertwined with medical and psychosocial factors, psychological theories have focused on the role of motivation during the recovery from substance abuse.<sup>7,8</sup> This is

particularly important due to the fact that motivation for drug use treatment is viewed by clinicians as a crucial determining factor in drug treatment and success in quitting the use of drugs.<sup>9</sup> According to Pelissier and Jones (2006, p. 113),<sup>8</sup> motivation related to drug treatment refers to 'a process involving multiple dimensions in which one goes through several stages of preparation to change behaviours associated with substance abuse'.

Accordingly, studies have empirically documented the importance of motivation as the active element underlying the recovery process for drug use treatment. Evidence in support of such findings has been provided by several studies showing that motivation for treatment is closely related to the commitment of the patients during treatment, evidenced by the therapeutic relationship between patients and counsellors,<sup>10,11</sup> after-treatment results<sup>12</sup> and long term changes.<sup>13</sup> Inversely, there is a growing stream of publications indicating the absence or lack of motivation is a key factor in drug addicts not seeking treatment, having low commitment during treatment and poor treatment results.<sup>14</sup> Low motivation is also associated with failure to cope with treatment.<sup>15,16</sup> Past studies drew conclusions highlighting the critical role of motivation-readiness factors in understanding drug treatment processes including treatment entry, retention and interpretation of treatment effectiveness.

Measuring the motivational levels for drug rehab treatment is a potentially important line of inquiry for several reasons. First, the motivational component may occur in the form of cognitive commitments or phases that help to start and maintain the dynamic process of every behavioural change<sup>16</sup> and is considered indispensable in the treatment of drug addiction.<sup>17</sup> Secondly, motivation is a complex construct with intrinsic and extrinsic aspects.<sup>18</sup> The intrinsic dimension comprises the inner desire of addicts to change while the extrinsic dimension involving external factors such as legal action and family pressure.<sup>19</sup> Analysis of these two dimensions of motivation can answer the question of why a person is undergoing treatment and also determine the potential success or failure of the treatment.<sup>20</sup> While intrinsic motivation is usually a fundamental motivation in the recovery process,<sup>18</sup> a recent meta-analysis review<sup>19</sup> supports the use of both intrinsic and extrinsic motivations for the treatment of substance use disorders. Thus, motivation must be continually assessed throughout the patient's treatment tenure.<sup>21</sup>

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In recognition of the role of motivation for drug use treatment, patient motivational screening instruments with satisfactory psychometric properties are needed for the purpose of strategic planning and treatment. Among the available instruments, the Treatment Motivation Scale<sup>16</sup> (TMS) is perhaps the most widely used tool for measuring the patient's motivation in drug treatment. The set of motivational scales consists of three scales, problem recognition, desire for help and treatment readiness. These scales represent three phases: the stage of identifying problems related to drug addiction, the stage of desire to be helped in making changes and the stage of readiness to follow the formal process of recovery treatment, respectively. According to Simpson and Joe,<sup>16</sup> the subscale of problem recognition is the earliest motivational stage during which ex-drug addicts develop awareness of the problems arising from taking drugs, which in turn leads them to seek treatment. The next stage is the desire to seek help, focusing on the intrinsic need for internal change to represent the need for help through a recovery programme. The final stage involves treatment readiness, which emphasises the commitment to engage in recovery programmes. Specifically, these scales are designed to reflect sequential phases in the recovery process<sup>22</sup> based on the four stages of the *Transtheoretical Model*<sup>17</sup>: pre-contemplation, contemplation, preparation and action.

The psychometric properties of the TMS are elaborated in various publications, but most of the validation studies have been conducted in Western samples.<sup>11,22,23</sup> Overall, this theory-based motivational scale<sup>17</sup> was found to have good psychometric properties and its predictive validity was well established. The structure of each scale was supported by confirmatory factor analysis on data from multiple samples consisting of long-term inpatients, outpatients participating in drug free programmes,<sup>11,24</sup> and prisoners undergoing drug treatment.<sup>23</sup> In addition, studies suggest a consistent pattern of significant relationships between the three scales and the background of the patients as well as other related measures, indicating concurrent validity.<sup>16</sup>

The psychometric properties of this measure have yet to be investigated in a non-Western sample of subjects such as in Malaysia. The aim of this study is to evaluate the reliability and validity of the Malay version of the TMS, and to compare the motivational levels among substance abuse treatment patients treated with different modalities (inpatient vs. outpatient).

## MATERIALS AND METHODS

### *Study Setting and Participants*

Data was collected from patients participating in the drug-free treatment programme in Cure and Care Service centres. These voluntary drug treatment centres offer inpatient and outpatient drug treatment with the intention of providing a holistic treatment strategy including voluntary psychosocial interventions, recreational programming, vocational training and religious instructions.<sup>25</sup> Upon admission to the treatment programme, each patient completed a set of questionnaires that included the TMS. Data was collected by trained interviewers and programme staff which followed

standard research protocols that included informed consent, voluntary participation and confidentiality of the responses provided by patients. Inclusion criteria were voluntary participation, and those having non severe general medical condition so that they could sit and complete the interviews. Exclusion criteria were illiteracy, cognitive impairment and patients with a history of schizophrenia or related psychotic disorders.

### *Treatment motivation scale*

The permission to use the questionnaire from the original authors was granted to the primary investigator. In order to establish the content validity of the Malay version, back to back translation was used to translate the scale. The translated version was reviewed by an expert panel, which suggested minor changes related to sentence structure to suit the Malay language. As shown in Appendix I, the minor changes involved rewording the original version (e.g., You have too many outside responsibilities now to be in this treatment programme) to (e.g. I have too many outside responsibilities now to be in this treatment programme). As stated above, the motivational scale<sup>16</sup> was divided into three subscales representing motivational stages. The original version contains 24 items related to problem recognition (9 items), desire for help (7 items) and treatment readiness (8 items).

Prior to the current study, a preliminary test was administered to 30 patients undergoing drug treatment in a different centre to check for the comprehensibility of the motivation scale. Interviews were conducted to obtain feedback from these patients about the items. From the feedback obtained we discovered that an item in the original problem recognition scale, 'drug use is causing problems in thinking or doing my work', required modifications as it was considered a double-barrelled statement for the participants. Hence, we decided to separate the statement into two items: item (M4) 'drug use is causing problems in my thinking' and item (M8) 'drug use is causing problems in doing my work'. Accordingly, in the current study, the problem recognition scale consisted of 10 items instead of 9, with 25 items for the total scale instead of 24. Each item was rated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree), with the score for each scale calculated as the sum of the appropriate items. High scores in each subscale represented a higher level in each scale.

## RESULTS

### *Characteristics of participants*

Table I summarises the demographic characteristics of the participants. Respondents consisted of 103 patients from 4 Cure and Care Service centres in Malaysia. However, one respondent was dropped from the analysis due to more than 20% missing data. The respondents were mostly men (93.1%), Malays (85.3%) and single (58.8%). They were between the ages of 15 and 70 (min = 36.6). Additionally, 53.4% (n = 55) of the respondents were inpatients while the rest were outpatients, including those who received methadone maintenance treatment. Overall, the treatment duration ranged from 1 to 9 months. However, 28 (27.4%) of the respondents reported that they have been seeking

treatment from these centres for more than 9 months, depending upon the needs of patients' and history of abuse. The participants were drug free for 7 days to 3 weeks (n=9; 8.8%) and 1 month to 16 months (n = 83; 81.4%). Ten (9.8%) of them were abstinent drug users from more than 10 years as they were under the methadone maintenance treatment programme.

#### *Construct validity*

Initially, the factorability of the TMS 25 items was examined. Several criteria for the factorability of a correlation was used<sup>26,27</sup>. Firstly, inspection of the correlation matrix revealed the presence of many correlation coefficients of 0.3 and above. The Barlett's test of sphericity resulted in a value of 964.155 ( $p < 0.001$ ) and the Kaiser-Meyer-Olkin measure of the sampling adequacy returned a value of 0.74, which is above the recommended value of 0.6, indicating the factorability of the correlation matrix. The factor loading matrix and communality values of the items are presented in Table II.

#### *Problem recognition scale*

Principal components analysis was performed for analysis of the 10 items in the scale. Initial analysis showed 2 components with eigenvalues exceeding one. The first factor explained 50.1% of the variance while the second factor explained 13.35% of the variance. The two-component solution explained a total of 63.45% of the variance. The communality values of all items were above 0.3, suggesting that the items fit well. All items had primary loadings over 0.4. Firstly, all items were loaded under Factor 1, with the exception of 2 items (M1 & M2). The first factor conceptually reflected the assessment of more specific types of problem recognition, while the second factor reflected the assessment of general problems related to drug addiction. The factor loadings ranged from 0.48 to 0.87. However, these two factors could be conceptually regarded as measures of problem recognition because most items had sufficiently high loadings for the first factor.

#### *Desire for help scale*

Two factors with an eigenvalue over 1 emerged from a principal component analysis of the 7 desire for help items, accounting for 55.6% of the variance. However, the item (M14) 'I will give up my friends and hangouts to solve my drug problems' had a communalities value below 0.3 (i.e., 0.21) and failed to meet the minimum criteria of having a primary factor loading of 0.4 or above on any factor. Hence, we decided to omit the item from the scale. Subsequent principal component analysis revealed 6 items (omitting item M14) explaining 62.7% of the variance. Rotating the items to a varimax solution suggested the existence of two factors with an eigenvalue over 1.00 (first factor eigenvalue was 2.66 and the second factor eigenvalue was 1.10). Five items loaded on Factor 1 accounted for 44.5% of the variance, with loading factors ranging from 0.54 to 0.83. The exception was an item (M13) that had a loading of 0.54 for the first factor and 0.45 for the second factor. An item (M15) loaded on Factor 2 accounted for 18.2 % of the variance. Although 2 factors emerged, given that it was difficult to determine how these items differed conceptually, a decision was made to include all 6 items as one factor, comprising the overall desire for help scale.<sup>24</sup>

#### *Treatment Readiness Scale*

As with the treatment readiness scale, two factors with an eigenvalue over 1.00 emerged from principal component analysis of the 8-item scale. The factors accounted for 49.1% of the variance. The first factor accounted for 28.3% of the variance, while the second accounted for 21% of the variance. Varimax rotation suggested that the two factors were distinct; Factor 1 included three items (M21, M22, M23) and Factor 2 included two items (M18, M20). The first and second factor loadings ranged from 0.56 to 0.57 and from 0.53 to 0.55, respectively. Three items had cross loading (M19, M24, M25), all with higher loading on the first factor. Factor 1 consisted of all the items under internal motivation readiness except item (M23) while Factor 2 consisted of all items under external motivation for treatment.

#### *Internal consistency*

Table III shows the descriptive statistics, item-to-total correlations and Cronbach's alpha coefficients for the scale. Internal consistency for each of the scales was examined using Cronbach's alpha. Overall, the Cronbach's alpha values were acceptable for all the scales. The Cronbach's alpha coefficients were acceptable for problem recognition (10 items;  $\alpha = 0.89$ ), as Nunnally<sup>28</sup> indicated 0.7 to be an acceptable reliability coefficient. Item correlations in the problem recognition scale suggest that each item had good correlation with other items, with the values ranging from 0.51 to 0.83.

Internal consistency for the desire for help scale was  $\alpha = 0.64$  (6 items). Most items related to the desire for help scale had good internal consistency (range 0.40 to 0.67) with the exception of item (M15), which had a low value (item-total correlation of 0.10). The treatment readiness scale (8 items) had an alpha value of 0.60. In relation to the internal consistency of the treatment readiness scale, the item-total correlations were moderate, ranging from 0.25 to 0.43. However, item (M19) in this scale had a poor internal consistency value, with an item-total correlation of 0.10. While such values may indicate the desire for help and treatment readiness scales are questionable<sup>29</sup>, previous research<sup>30</sup> has indicated that in a study with a small sample size, low Cronbach alpha scores such as 0.6 can be used as a measure of acceptability. The Cronbach's  $\alpha$  value of the overall TMS was good (24 items;  $\alpha = 0.84$ ).

#### *Descriptive statistics and t-test*

The mean and standard deviation of the Malay version of the TMS were computed for each scale and for the total score. The results are summarised by treatment modality in Table III. Independent sample t-test was used to examine whether there were significant differences between treatment modalities (inpatient vs. outpatient) in relation to each motivational scale. The results suggested there were significant motivational differences by modality types. Significant differences were observed for the problem recognition scale  $t(100) = 3.27$ ,  $p < 0.01$ ; desire for help scale  $t(100) = 2.60$ ,  $p < 0.05$  and treatment readiness scale  $t(100) = 2.60$ ,  $p < 0.05$ , with inpatients having significantly higher scores in each scale than outpatients.

Table I: Demographic background (N=102)

	Frequencies	%
<b>Treatment modalities</b>		
Inpatient	55	53.4%
Outpatient	47	47.6%
<b>Gender</b>		
Males	95	93.1%
Females	7	6.9%
<b>Race</b>		
Malay	87	85.3%
Chinese	8	7.8%
Indian	6	5.9%
Others	1	1%
<b>Marital status</b>		
Single	60	58.8%
Married	32	31.4%
Others	10	9.8%
<b>Education</b>		
Primary school	15	14.7%
PMR	25	24.5%
SPM	56	54.9%
STPM	1	1%
Diploma	3	2.9%
Degree	2	2.0%

Table II: Communalities (h<sup>2</sup>) and Factor Loadings by Varimax Rotation for Each Motivation Subscale

Scales/Item	Factor 1	Factor 2	h <sup>2</sup>
<i>Problem Recognition Scale</i>			
M1 Drug use is a problem for me.		0.84	0.72
M2 Drug use is more trouble than it's worth.		0.86	0.76
M3 Drug use is causing problem with the law.	0.48		0.63
M4 <sup>a</sup> Drug use is causing problems in my thinking.	0.66		0.57
M5 Drug use is causing problems with my family or friends.	0.72		0.65
M6 Drug use is causing problems in finding or keeping a job.	0.75		0.78
M7 Drug use is causing problems with my health.	0.65		0.44
M8 <sup>a</sup> Drug use is causing problems in doing my work.	0.87		0.77
M9 Drug use is making life become worse and worse.	0.75		0.59
M10 Drug use is going to cause death if I do not quit soon.	0.52		0.41
Eigenvalue	5.01	1.33	
% of total variance	50.1	13.36	
Total variance	50.1	63.45	
<i>Desire for help scale</i>			
M11 I need help in dealing with my drug use.	0.77		0.63
M12 It is urgent to find help immediately for my drug use.	0.83		0.74
M13 I am tired of the problems caused by drugs.	0.54	0.45	0.50
M14 <sup>b</sup> I will give up my friends and hangouts to solve my drug problems.			
M15 I can quit using drugs without any help.		0.94	0.88
M16 My life has gone out of control.	0.71		0.51
M17 I want to get my life straightened out.	0.70		0.48
Eigenvalue	2.67	1.09	
% of total variance	44.47	18.19	
Total variance	44.47	62.66	
<i>Treatment readiness scale</i>			
M18 I have too many outside responsibilities now to be in treatment programme.		0.53	0.42
M19 This treatment programme seems too demanding for me.	0.59	0.44	0.56
M20 This treatment programme may be my last chance to solve my drug problem.		0.55	0.33
M21 This kind of treatment programme will not be very helpful to me.	0.57		0.47
M22 I plan to stay in this treatment programme for a while.	0.56		0.37
M23 I am in this treatment programme because someone else made me come.	0.57		0.45
M24 This treatment programme can really help me.	0.62	0.52	0.65
M25 I want to be in a drug treatment programme.	0.63	0.53	0.68
Eigenvalue	2.26	1.66	
% of total variance	28.35	20.77	
Total variance	28.35	49.13	

Note: <sup>a</sup>double-barrelled statement of the original measure was split into these 2 items, <sup>b</sup>Item 0.40 and lower were suppressed.

**Table III: Descriptive Statistics, Item- to-Total Correlations, and Cronbach's Alpha Coefficients for Each Subscale of Treatment Motivation by Treatment Modality**

Scales/Item	M(SD) In- patient	M(SD) Out- patient	M (SD) Total sample	Item-total correlation
<i>Problem Recognition Scale</i>				
M1 Drug use is a problem for me.	6.54 (1.25)	6.08 (1.59)	6.33 (1.43)	0.51
M2 Drug use is more trouble than it's worth.	6.56 (0.91)	6.15 (1.42)	6.37 (1.19)	0.53
M3 Drug use is causing problem with the law.	6.75 (0.61)	6.21 (1.28)	6.50 (1.01)	0.69
M4 Drug use is causing problems in my thinking.	6.27 (1.28)	5.61 (1.58)	5.97 (1.45)	0.69
M5 Drug use is causing problems with my family or friends.	6.55 (0.99)	5.96 (1.41)	6.27 (1.23)	0.71
M6 Drug use is causing problems in finding or keeping a job.	6.55 (0.78)	5.85 (1.38)	6.23 (1.15)	0.83
M7 Drug use is causing problems with my health.	6.38 (1.04)	5.79 (1.62)	6.11 (1.37)	0.52
M8 Drug use is causing problems in doing my work.	6.27 (1.20)	5.70 (1.84)	6.01 (1.55)	0.60
M9 Drug use is making life become worse and worse.	6.65 (0.90)	6.19 (1.26)	6.44 (1.10)	0.62
M10 Drug use is going to cause death if I do not quit soon.	6.56 (0.93)	6.02 (1.51)	6.32 (1.25)	0.53
*Total problem recognition (10 items; $\alpha = 0.89$ )	6.50 (0.59)	5.95 (1.07)	6.25 (0.89)	
<i>Desire for Help Scale</i>				
M11 I need help in dealing with my drug use.	6.76 (0.54)	6.28 (1.54)	6.54 (1.13)	0.56
M12 It is urgent to find help immediately for my drug use.	6.76 (0.54)	6.13 (1.56)	6.51 (1.09)	0.67
M13 I am tired of the problems caused by drugs.	6.35 (1.30)	6.19 (1.37)	6.27 (1.33)	0.47
M15 I can quit using drugs without any help.	5.50 (1.99)	4.59 (2.14)	5.11 (2.10)	0.10
M16 My life has gone out of control.	5.87 (1.70)	5.64 (1.71)	5.82 (1.70)	0.40
M17 I want to get my life straightened out.	6.64 (0.80)	6.37 (0.92)	6.53 (0.88)	0.41
*Total desire for help (6 items; $\alpha = 0.64$ )	6.31 (0.62)	5.90 (0.93)	6.12 (0.80)	
<i>Treatment Readiness Scale</i>				
M18 I have too many outside responsibilities now to be in treatment programme.	4.14 (2.28)	2.59 (1.83)	3.43 (2.21)	0.25
M19 This treatment programme seems too demanding for me.	5.55 (1.83)	4.90 (2.14)	5.26 (1.99)	0.10
M20 This treatment programme may be my last chance to solve my drug problem.	5.47 (1.99)	5.72 (1.55)	5.58 (1.80)	0.41
M21 This kind of treatment programme will not be very helpful to me.	5.33 (2.08)	2.34 (5.06)	5.06 (2.21)	0.38
M22 I plan to stay in this treatment programme for a while.	6.02 (1.68)	5.76 (1.72)	5.90 (1.69)	0.34
M23 I am in this treatment programme because someone else made me come.	5.42 (1.95)	4.42 (2.31)	4.96 (2.18)	0.43
M24 This treatment programme can really help me.	6.35 (1.19)	6.38 (.87)	6.36 (1.05)	0.33
M25 I want to be in a drug treatment programme.	6.45 (1.35)	6.43 (1.11)	6.44 (1.24)	0.36
*Total treatment readiness (8 items; $\alpha = 0.60$ )	5.59 (0.97)	5.12 (0.84)	5.37 (0.94)	
*Overall treatment motivation (24 items; $\alpha = 0.84$ )	6.16 (0.57)	5.67 (0.78)	5.93 (0.71)	

Note: Significant difference between inpatient and outpatient scores,  $p < .05$



Table IV: Intercorrelations among subscales and total scales

Scales	1	2	3	4
1. Problem recognition	-			
2. Desire for help	.77**	-		
3. Treatment readiness	.28**	.41**	-	
4. Total motivation	.86**	.87**	.68**	-

Appendix I: Malay version of Treatment Motivation Scale

Scales/Items	
<i>Skala mengenal pasti masalah</i>	
M1	Ketagihan dadah memberi masalah kepada saya.
M2	Ketagihan dadah lebih memberikan masalah berbanding kebaikan.
M3	Ketagihan dadah menyebabkan saya menghadapi masalah undang-undang.
M4	Ketagihan dadah menyebabkan saya menghadapi kesukaran berfikir.
M5	Ketagihan dadah menyebabkan saya menghadapi masalah dengan keluarga atau rakan.
M6	Ketagihan dadah menyebabkan saya menghadapi kesulitan mencari atau mengekalkan pekerjaan.
M7	Ketagihan dadah menyebabkan saya menghadapi masalah kesihatan.
M8	Ketagihan dadah menyebabkan saya menghadapi masalah semasa bekerja.
M9	Ketagihan dadah menyebabkan hidup saya semakin teruk.
M10	Ketagihan dadah boleh menyebabkan kematian sekiranya saya tidak berhenti secepat mungkin.
<i>Skala keperluan mendapat pertolongan</i>	
M11	Saya perlukan pertolongan untuk berhenti menagih dadah.
M12	Saya perlu segera mencari pertolongan untuk berhenti menagih.
M13	Saya bosan dengan masalah-masalah yang berkaitan dengan ketagihan.
M14#	Saya sanggup tinggalkan rakan-rakan penagih untuk mengelakkan diri dari dadah.
M15*	Saya boleh berhenti menagih tanpa pertolongan sesiapa.
M16	Hidup saya berada di luar kawalan akibat dadah.
M17	Saya mahu membetulkan kesilapan saya dengan berhenti menagih.
<i>Skala Kesediaan Rawatan</i>	
M18*	Saya ada lebih tanggungjawab luar (kerja/ keluarga) berbanding dengan menjalani rawatan sekarang.
M19*	Rawatan di sini dirasakan terlalu membebankan.
M20	Rawatan di sini adalah jalan terakhir untuk saya keluar dari penagihan.
M21*	Rawatan seumpama ini tidak akan membantu saya untuk berhenti menagih.
M22	Saya bercadang untuk meneruskan rawatan di sini untuk beberapa ketika.
M23*	Saya berada di pusat rawatan ini kerana dipaksa/ dirujuk oleh keluarga/ rakan.
M24	Rawatan ini pasti dapat membantu saya berhenti menagih.
M25	Saya memang mahu menjalani rawatan untuk berhenti menagih.

Note: \*item reverse coded; #item deleted due to low (<.40) item total correlation

### Correlations among motivation scales

Pearson product-moment correlation was used to examine the inter-relation between the three motivation components (Table IV). The results showed significant relationships between each scale. There was a strong relationship between problem recognition and desire for help,  $r = 0.77$  ( $p < 0.001$ ). A moderate relationship was found between desire for help and treatment readiness,  $r = 0.41$  ( $p < 0.001$ ), while a weaker relationship was evident between problem recognition and treatment readiness,  $r = 0.28$  ( $p < 0.01$ ).

### DISCUSSION

The main aim of this paper was to address the psychometric properties of the Malay version of the TMS<sup>16</sup>. Principal components analysis with varimax rotation supported a two-factor solution for each subscale, with problem recognition, desire for help and treatment accounting for 63.5%, 62.7% and 49.1% of the variances, respectively. The results suggested that the structure of most emerging factors largely replicated those of the original scales.<sup>24</sup> The results also suggested that the split items (M4 'Drug use is causing problems in my thinking' and M8 'Drug use is causing

problems in doing my work') in the problem recognition scale had good reliability values and identified well with the appropriate factors. An item (M14, 'I will give up my friends and hangouts to solve my drug problems') in the desire for help scale in the original measure was omitted owing to a poor loading value. Hence, the adapted Malay version of the motivation treatment scale consisted of 24 items.

Furthermore, the three subscales were theoretically conceptualised to measure different stages yet were assumed to be interrelated. For instance, based on an earlier study,<sup>16</sup> the results of factor analyses supported single-factor solutions for all three scales. In addition, similar to the original version of the motivational scale, we found stronger significant relationships between adjoining stages (i.e., problem recognition and desire for help, and desire for help and treatment readiness) than non-contiguous stages (problem recognition and treatment readiness), which further support the probability of linear progression between motivational stages.<sup>10,16</sup>

For this study, the Cronbach's  $\alpha$  for the total TMS score was 0.84, indicating good internal consistency. A study<sup>21</sup> in South

Africa suggested that the internal consistency of the three scales was sufficiently high, ranging from 0.68 to 0.97. Our results suggest that all coefficient alpha reliability values for the three scales were within the acceptable range. The total coefficient reliability value demonstrated high internal consistency for the problem recognition scale ( $\alpha = 0.89$ ). The results are comparable with the values in previous studies,<sup>10,16,23</sup> which ranged from 0.82 to 0.90. Likewise, the value of the Cronbach alpha (0.64) for the desire for help scale in our study was comparable to those obtained in a previous study<sup>10</sup> ( $\alpha = 0.67$ ). The internal consistency for the treatment readiness scale was the lowest of the three ( $\alpha = 0.60$ ). The value was lower than those obtained from previous research,<sup>10,16</sup> which ranged from 0.72 to 0.74. Overall, these alpha values may have been influenced by the smaller sample used in the present study, compared to the samples in Western studies.

Our results revealed differences according to the treatment modalities. Specifically, the overall motivational level and individual subscales (problem recognition, desire for help and treatment readiness) were significantly lower among outpatients compared to inpatients. Our findings point in the same direction as past studies,<sup>21,32</sup> demonstrating that among various treatment modalities, outpatient settings result in lower motivation than inpatient treatment. The findings also corroborate prior work<sup>21</sup> reporting differences in motivation across different modalities. Although the reasons behind these findings remain to be explored in a future study, a number of factors are likely to contribute. For example, an important factor examined in past research<sup>21</sup> has been the fact that patient self-selection was based upon the intensity and demand of the treatment modality. Inpatient treatment represents high demand in the amount of contact compared to outpatient settings, which may involve contact only one or two days a week. Additionally, peer support may play important roles in this regard. In contrast to inpatient settings, outpatients likely receive less peer support as they do not stay together in an extensive therapeutic environment.<sup>20</sup>

The present study provides preliminary results concerning the reliability and validity of the adapted Malay version of the motivation for treatment scale. However, there are a few issues. Specifically, test-retest reliability, convergent validity and confirmatory factor analysis were not evaluated, which may limit the interpretation of the findings. Another limitation is that the sample size was rather small. Hence, future studies need to test the fit of the model using other large-scale treatment programmes within other populations including younger samples, prison inmates and those with severe psychopathology and medical illness related to substance use including HIV/AIDS problems.

## CONCLUSION

The present study pointed towards the favourable psychometric properties of the Malay version of TMS, suggesting that this screening instrument can be potentially used to evaluate patient motivation, readiness and perception of drug treatment which is independently associated with many clinical settings including hospitals, methadone clinics, private practices, mental health centres

and drug rehabilitation centres. Given that our findings also suggest significant differences according to treatment modalities, such knowledge could be used to plan motivational intervention methods to identify the patients' stage of change and thus boost their readiness level.

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## DECLARATION OF CONFLICTING INTERESTS

The author(s) declared no potential conflicts of interests with respect to the research, authorship and/or publication of this article.

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