

## MOTIVATION FOR ADDICTION TREATMENT-HINDI SCALE: DEVELOPMENT AND FACTOR STRUCTURE

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### ABSTRACT

*Motivation for Addiction Treatment-Hindi scale was developed as a 'generic' scale applicable across different substances of abuse. This 46-item self-report Likert scale was administered to 262 treatment-seeking men with a diagnosis of alcohol or opioid dependence as per International Classification of Diseases-10th revision. Factor analysis generated 15 factors that covered all 46 items and explained 63.7% of the total variance. Factors I (12 items) and II (6 items), reflected acceptance and rejection of the existence of the problem of addiction and the treatment offered and, explained 20.7% and 7.6% of the variance respectively. Test-retest reliability and measures of internal consistency yielded satisfactory results. While the whole scale but not Factors I & II differentiated alcohol and opioid dependent groups, Factors I & II but not the whole scale differentiated relapsed from non-relapsed cases at  $\geq 6$  month follow-up. With some limitations, this scale presents a new tool to assess motivation for addiction treatment in Hindi speaking population in terms of two global dimensions of acceptance and rejection of the problem of addiction and the treatment offered.*

*Key words: Substance abuse, treatment, motivation, factor analysis*

Although there are professionals and specialty journals focusing on addiction treatment, what motivates the people to change addictive behaviors is still not well understood (Miller, 1998). This knowledge is important for the clinicians to facilitate behavior change needed for treatment and sustained abstinence in substance abusers (Peteet et al., 1998).

On one hand motivation has been explained using constructs like distress, self-label, desire for help, reasons for change, agreement with the therapist, self-efficacy, treatment compliance, locus of control etc. On the other hand motivation is used to explain success or failure to enter, continue, comply with and complete the treatment (Miller, 1985).

While earlier research examined a host of motivating factors including health, family relationships, employment, friendship, spiritual

values, self-respect, finances, and enjoyment of life, the focus was almost exclusively on alcohol dependence (Eastman & Norris, 1982; Vaillant & Milofsky, 1982; Ludwig, 1985; Amodeo et al., 1992). In more recent research the focus has been specifically on the construct of readiness for change (Prochaska et al., 1992) and its application in abusers of different substances including alcohol, opioids, tobacco etc. (Rollnick et al., 1992; Miller & Tonigan, 1996; Maisto et al., 1999; Downey et al., 2001).

Indian research in this area has been meager. Motivation scale for alcohol dependent subjects developed by Neeliyara & Nagalakshmi (1994) was a general measure of desire for change based on data from 600 normal (non-alcoholic, non-psychiatric) subjects. Six factors obtained, which accounted for 55.2% of variance, were: self-esteem, locus of control - internal, drinking related

locus of control - internal, growth motivation, religious attitude, and self-criticality.

The present research was planned with a broad aim of developing a 'generic' scale (applicable for all substances of dependence) to assess motivation for substance abuse treatment in Hindi speaking population. The objectives were to study the factor structure and psychometric properties of the scale, to compare it across alcohol and opioid dependent subjects and to validate it in terms of outcome differentiation between relapsed and non-relapsed cases at  $\geq 6$  month follow-up.

## MATERIAL AND METHOD

### Scale development

Based on a review of the relevant literature and clinical experience, available tools were scrutinized to select 46 items representative of motivation for addiction treatment irrespective of the substance of abuse. The items covered different areas like external locus of control (N=17), internal locus of control (N=9), outcome (N=10), severity (N=7), reasons for seeking treatment (N=6), responsibility for addiction (N=5), helplessness/help-needed (N=5), agreement with the therapist (N=5), nature of treatment (N=4), treatment responsibility (N=3), global motivation (N=1). These items were paraphrased in simple Hindi independently by 3 Hindi-knowing professionals (one Additional Professor of Psychiatry, one Social Scientist and one Psychiatric Social Worker) working at the Drug De-addiction and Treatment Center (DDTC), Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh. While paraphrasing importance was given to the psychosocial rather than literal meaning of the words, phrases and sentences and the items were so phrased that they were applicable to all substances of abuse. The three sets were merged into one by discussion and consensus. A five point Likert type format of responses was arranged, ranging from "strongly agree" (score 4) to "strongly disagree" (score 0). All the items were unidirectional. The possible

range of scores was 0-184, a higher score indicating better motivation. The scale took 10-15 minutes to complete.

### Test-retest reliability

The scale was administered at an interval of 4-5 weeks, to 30 consenting adult male inpatients of the DDTC who could read and write Hindi and included 15 cases each with alcohol and opioid dependence diagnosed as per the International Classification of Diseases-10th revision (ICD-10) (World Health Organization, 1992). The scale was administered in the third or fourth week of abstinence when the subjects were not under intoxication or acute withdrawal. The subjects included 23 urban dwellers, had an age range of 18-52 years ( $m \pm sd$ :  $32.12 \pm 8.06$ ), and were educated for 10-16 years ( $m \pm sd$ :  $14.05 \pm 2.87$ ). The test-retest correlation of the total score calculated by Pearson's product moment method was 0.63.

### Sample

Finally, the scale was administered to 262 consenting adult men seeking treatment as out-/in-patients at the DDTC, including 131 cases each of alcohol and opioid dependence diagnosed as per ICD-10. The details of the subjects' substance abuse were crosschecked with at least one family member who was regularly living with him and was actively involved in his treatment. As assessed clinically, at the time of scale administration, the patients were not under intoxication or acute withdrawal.

### Predictive validity

For establishing the predictive validity of the scale attempts were made through phone call/home visit for the local patients and letters for the outstation patients, beginning with 6 months from the date of intake. The first 200 patients contacted (100 each of alcohol and opioid dependence) were assessed to record their status in terms of a relapse of substance dependence diagnosed as per ICD-10 or no relapse (complete abstinence or substance use not amounting to substance dependence as per ICD-10). For this purpose the information provided by the patient about his substance use was crosschecked from at least one family member who was regularly living with

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him and was actively involved in his treatment.

### Statistical analysis

Sociodemographic and clinical profile of the two substance groups was compared using Chi square test and Students' t test for categorical and continuous variables respectively.

Factor analysis was carried out to examine whether motivation for treatment emerged as a uni-/multi-dimensional construct. All the 46 items of the scale were subjected to principal component factor analysis followed by varimax rotation. The subject to item ratio was 5.7:1. Items were retained in the factor in which they had the highest loading. The criteria for retaining the factors were: 1. Eigen value more than 1. 2. Factor loading on each item to be  $\geq 0.40$ . 3. Presence of at least 4 items in a factor, and 4. Item that appears in two or more factors to be retained in the factor in which it has the highest loading.

Statistical properties were calculated for the whole scale and the retained factors in terms of test-retest reliability (using Product Moment Correlation), E1/3 values and measures of internal consistency in terms of split-half reliability (using Spearman Brown Prophecy Formula), Cronbach's alpha values, and item-item and item-total correlations.

The score profile (range, mean and sd) of the whole sample as well as the alcohol and opioid groups was compared using student's t test for the whole scale as well as the two retained factors.

The score profile (mean and sd) of alcohol and opioid groups for the relapsed and non-relapsed cases at  $\geq 6$  month follow-up was compared using student's t test for the whole scale as well as the two retained factors.

## RESULTS

### Sample

The two groups were comparable across sociodemographic and clinical variables except that compared to opioid group, the alcohol group was older and more often married ( $p < 0.001$ ), had later ages at onset of substance use ( $p < 0.05$ ) and substance dependence ( $p < 0.001$ ) and, had a

longer duration of substance use and dependence ( $p < 0.001$ ) (Tables 1&2).

TABLE 1  
SAMPLE CHARACTERISTICS

Characteristic	Alcohol group (N=131)	Opioid group (N=131)	$\chi^2$ (p=)
<b>Religion</b>			
Hindu	64	75	1.53
Sikh	67	56	(0.215)
<b>Occupation</b>			
Professional	21	19	7.79
Clerk/Shop/ Farmer	40	47	(0.051)
Skilled/ Unskilled worker	47	29	
Unemployed/ Student/Retired	23	36	
<b>Marital Status</b>			
Unmarried	27	62	20.90
Married	97	65	(0.001)
Others	7	4	
<b>Family Type</b>			
Nuclear	72	59	4.60
Joint	46	48	(0.100)
Others	13	24	
<b>Residence</b>			
Urban	85	92	0.63
Rural	46	39	(0.428)

TABLE 2  
SAMPLE CHARACTERISTICS

Characteristic	Whole Sample (N=262)		Alcohol group (N=131)		Opioid group (N=131)	
	Mean	SD	Mean	SD	Mean	SD
Age (years)	33.93	9.92	39.08	8.99	28.78	7.97
		t=8.57**				
Education (years)	10.94	3.81	11.18	4.13	10.70	3.46
		t=0.89				
<b>Age at onset (years)</b>						
Substance-Use	19.51	5.30	20.42	5.55	18.59	4.90
		t=2.47*				
Substance-Dependence	25.32	8.30	28.26	8.88	22.38	6.50
		t=5.34**				
<b>Duration (years)</b>						
Substance-Use	14.41	9.38	18.64	9.66	10.18	6.87
		t=7.14**				
Substance-Dependence	8.76	7.46	10.81	8.48	6.70	5.67
		t=4.03**				

\* $p < 0.05$ , \*\* $p < 0.001$

### Factor structure

The rotated factor matrix gave a 15-factor solution covering all 46 items of the scale. As per the criteria mentioned earlier, 13 factors were excluded for either having less than four items each with load  $\geq 0.40$  and items getting included in a factor in which they had a higher loading. Thus, only two factors comprising 18 items were retained to explain the factor structure. Factor I included 12 items that had the common features of acceptance of the existence of the problem of addiction and the treatment offered. Factor II included 6 items that had the common features of rejection of the existence of the problem of addiction and the treatment offered.

### Psychometric properties

While the whole scale of 46 items explained 63.7% of the total variance, Factor I & II comprising 18 items explained 28.3% of the total variance. The E1/3 values for the whole scale and Factors I & II ranged from the lowest of 0.26-0.61 to the highest of 0.69-0.73. The test-retest reliability (N=30) for the whole scale and Factor I & II ranged from 0.59 to 0.63. The split-half reliability for the whole scale and Factor I & II ranged from 0.30 to 0.40. The Cronbach's alpha reliability coefficient for the whole scale and Factor I & II ranged from 0.89 to 1.0. The item-item and item-total correlations within Factor I & II ranged from the lowest of 0.14-0.15 to the highest of 0.52-0.60; the p value for these correlations ranged from  $<0.05$  to  $<0.01$  for all except 5 items. The item-item and item-total correlation outside the Factor I & II ranged from the lowest of 0.01-0.05 to the highest of 0.40-0.42; the p values for these correlations ranged from  $<0.99$  to  $<0.01$  (Table 3).

### Score Profile

For the whole sample the respective range and mean $\pm$ sd of the scores were: 16-48, 40.14 and 6.97 for Factor I, 2-19, 11.85 and 2.10 for Factor II, 27-65, 51.99 and 7.35 for Factors I+II and 88-164, 138.93 and 12.92 for the whole scale. Score profile of alcohol and opioid groups for the two factors was similar but the alcohol group had a significantly higher score on the whole scale ( $p<0.05$ ) (Table 4).

### Scores of Relapsed Vs Non-relapsed Cases

Within the alcohol and opioid groups, relapsed vs. non-relapsed cases at  $\geq 6$  month follow-up had a similar score at intake for the whole scale, but non-relapsed cases had higher scores for both the factors ( $p<0.01$ ). Across the two groups, the scores of the relapsed and non-relapsed cases were similar (Table 5).

## **DISCUSSION**

Assessment of motivation for addiction treatment has not been put to research practice in India. A possible simple reason could be the non-availability of culturally applicable tools to measure motivation for addiction treatment. The broad goal of the present study was to prepare a psychometrically sound generic scale in Hindi, applicable across all the substance of abuse, to measure motivation for addiction treatment and assess its factor structure.

The factor structure of the scale restricted itself to the two factors. Factor I included 12 items reflecting an acceptance of the problem of addiction and the treatment offered. Factor II included 6 items reflecting a rejection of the problem of addiction and the treatment offered. The items of these factors cut across different clinically understood dimensions/aspects of motivation for addiction treatment e. g. readiness for change, distress, helplessness, locus of control, owning/blaming attitude, self-efficacy, agreement with the therapist etc. (Miller, 1985; Rollnick *et al.*, 1992; Neeliyara & Nagalakshmi, 1994; Miller and Tonigan, 1996; Maisto *et al.*, 1999; Downey *et al.*, 2001). Thus, this scale failed to validate these clinically understood dimensions/aspects of motivation for addiction treatment as discreet units for clinical assessment of motivation for addiction treatment. Instead, it presented the motivation for addiction treatment in terms of global constructs of good or bad motivation that seem to be related like the two opposite sides of the same coin. Thus, perhaps motivation for addiction treatment can be considered to be good or bad as judged clinically, based on a holistic

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**TABLE 3**  
MOTIVATION FOR ADDICTION TREATMENT-HINDI SCALE: STATISTICAL PROPERTIES

Scale property	Factor I	Factor II	Factor I+II	Whole Scale
Number of items	12	6	18	46
Variance explained	20.7%	7.6%	28.3%	63.7%
E1/3 value	0.55-0.72	0.61-0.69	0.55-0.72	0.26-0.73
Test-retest reliability*	0.62	0.59	0.62	0.63
Split-half reliability	0.35	0.30	0.34	0.40
Cronbach's alpha	0.97	0.89	0.98	1.0
Item-item & Item-total correlations				
-with-in factors	0.14-0.60	0.15-0.52	0.14-0.60	0.14-0.60
-with-out factors	0.01-0.42	0.05-0.40	0.01-0.42	0.01-0.42

\*N=30; for all others N=262

**TABLE 4**  
MOTIVATION FOR ADDICTION TREATMENT-HINDI SCALE: SCORE PROFILE

Factor/Scale (Items)	Whole group (N=262)			Alcohol group (N=131)			Opioid group (N=131)			t
	Range	Mean	SD	Range	Mean	SD	Range	Mean	SD	
Factor I (12)	16-48	40.14	6.97	25-48	41.04	5.77	16-48	39.24	7.93	1.84
Factor II (6)	2-19	11.85	2.10	6-16	11.78	1.93	2-19	11.92	2.26	0.47
Factors I+II (18)	27-65	51.99	7.35	33-63	52.82	6.07	27-65	51.16	8.39	1.60
Whole Scale (46)	88-164	138.93	12.92	88-164	140.81	12.49	88-164	137.04	13.13	2.38*

\*p<0.05

assessment of the acceptance or rejection of the problem of addiction and the treatment offered.

The E1/3 values of 0.26-0.73 for the whole scale and 0.55-0.72 for the two factors reflect a high endorsement rate.

The variance explained by the whole scale is high (63.7%) but the variance explained by the factors is moderate (28.3%). This implies that motivation is explained to a greater extent by the whole scale compared to the two factors. Thus, the two factors by themselves cannot be recommended as a very reliable measure of motivation for addiction treatment. Further refinement of the scale is needed to generate factors that can explain motivation to a greater extent.

The Cronbach's alpha reliability coefficients of 0.89 to 1.0 for factors/whole scale reflect a high level of internal consistency and compare favorably with the alpha value of 0.60 recommended for the scale to be used in the basic research (Nunnally, 1978). This is further reflected by the item-item and item-total correlations being high within the

(0.01-0.42). The low split-half reliability of 0.30-0.40 may partly be attributed to a wide range of motivation displayed by a wide variety of patients (in-/out-patients, first-/multi-contact patients, self-/family-motivated patients). The test-retest reliability of 0.59-0.63 for the factors/whole scale reflects a moderately high stability of the scale that aims at measuring a construct that is dynamic and likely to change under a variety of influences including treatment. Thus, overall the scale shows reasonably acceptable psychometric properties.

At the time of the intake the alcohol and opioid groups being differentiated weakly by the whole scale and not by the two factors, partly supports the generic nature of the scale i.e. its applicability across different substances of abuse.

The  $\geq 6$  months follow-up data showing similar proportion of relapsed and non-relapsed cases across the alcohol and opioid groups is consistent with the clinical experience of the two groups having a generally similar course of illness (Maisto et al., 1999). That in both the groups, compared to the relapsed cases the non-relapsed

TABLE 5  
MOTIVATION FOR ADDICTION TREATMENT-HINDI SCALE: INITIAL SCORES AND OUTCOME

Factor/Scale	Alcohol group				t	Opioid group				
	Relapsed(N=64)		Non-Relapsed(N=36)			Relapsed(N=76)		Non-Relapsed (N=24)		
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	t
Factor I	36.09	5.38	45.99	5.57	8.636*	31.28	7.12	47.20	8.28	8.481*
Factor II	10.05	2.17	13.54	1.79	8.655*	9.89	2.48	13.96	2.04	8.017*
Factors I+II	46.66	5.92	58.89	6.12	9.705*	42.40	8.40	59.65	8.37	4.466*
Whole scale	139.11	12.25	142.51	12.76	1.297	135.00	12.91	139.07	13.36	1.31

\*p<0.01

cases had higher motivation scores for the factors but not the whole scale at the time of intake, adds to the validity of the items comprising the factors, but not the whole scale. Thus, the factors but not the whole scale can be used to predict the outcome in terms of relapse and non-relapse over a period of  $\geq 6$  months. This aspect will need further attention when scale refinements are attempted to improve the power of the factor vs. the whole scale to predict outcome.

The results suggest that the broad aim of the study to prepare a psychometrically sound generic scale, applicable across all the substances of abuse, to measure motivation for addiction treatment in Hindi and assess its factor structure can be said to have been met.

The sociodemographic and clinical profile of the sample of the present study being comparable to that of the substance dependent subjects seeking treatment at our Center (PGIMER, 1993), the results can be considered to be applicable to substance dependent subjects seeking treatment at our Center. Yet, the sample being small and limited to only alcohol and opioid dependent men from a single Hindi speaking area, the score profile obtained in the present study may have limitations to its generalizability to the subjects abusing different substances in different Hindi speaking areas all over India. Further work with large and representative populations will be needed to refine the scale and generate the norms for different substance-specific sociodemographic groups. Within these limitations, MAT-Hindi scale can be applied in clinical work with Hindi speaking substance-abusing populations.

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