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Psychometric Evaluation of Persian Translation for Recovery Assessment Scale - Domains and Stages (RAS-DS) Questionnaire in Patients with Schizophrenia and Major Mood Disorders

Fatemeh Banihashemian[1], Amir Hossein Jalali Nadoushan[1], Mahdi Safdarian[1,2], Maryam Rafieian Koopaiee[1], Tara Rezvankhah[1], Kaveh Alavi[1]*

1. *Department of Psychiatry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran*
2. *Department of Neurology, Neurocritical Care and Neurorehabilitation, Christian Doppler University Hospital, Centre of Cognitive Neuroscience, Paracelsus Medical University, Salzburg, Austria*

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Corresponding Information:
Kaveh Alavi,
Department of Psychiatry, School of Medicine, Iran University of Medical Sciences, Tehran, Iran

Email: mahdisafdarian@gmail.com

ABSTRACT

Background & Objective: Considering the lack of quantitative measurement tools to monitor recovery in the patients with schizophrenia spectrum or major mood disorders in Iranian patients, this study was designed to determine the validity and reliability for the Persian translation of self-report questionnaire Recovery Assessment Scale: domains and stages (RAS-DS).

Materials & Methods: The Persian version of RAS-DS was prepared via an independent translation process. Sampling was done from in- and outpatients referred to Iran Psychiatric Hospital. Patients completed demographic information datasheet, WHO quality of life - Brief Form (WHOQoL-BREF), Depression, Anxiety, Stress Scale (DASS-21), and translated RAS-DS questionnaires, in addition to Brief Psychiatric Rating Scale (BPRS). Twenty patients completed the RAS-DS and WHOQoL-BREF for the follow-up evaluation in two to four weeks.

Results: 142 patients (81 men and 61 women) participated in this study with an average age of 35.4 (± 9.2) years. The intensity of depression, anxiety, and stress (DASS-21) exhibited a significant negative correlation with all domains of RAS-DS, while the various domains of quality of life (WHOQoL-BREF) exhibited a positive and significant correlation. All domains of RAS-DS had positive significant correlations with each other, and with the total score of questionnaire. Cronbach's alpha coefficient was calculated as 0.960 for the whole questionnaire and 0.835, 0.944, 0.881, and 0.815 for its four domains, respectively.

Conclusion: Persian translation of RAS-DS questionnaire has good reliability and validity, as well as acceptable internal consistency, and could therefore be used to conduct research in the field of recovery for Iranian patients with schizophrenia spectrum and major mood disorders.

Keywords: Bipolar Disorder, Depressive Disorder, Major, Mental Health Recovery, Schizophrenia, Surveys and Questionnaires

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1. Introduction

Mental disorders are one of the leading causes in the non-fatal burden of diseases worldwide that can affect people of all ages (1). Approximately 450 million individuals globally are believed to be afflicted by these severe illnesses (2). The Global Burden of Diseases research in 2022 indicates that Disability-adjusted life years (DALYs) for mental illnesses rose from 80.8 million in 1990 to 125.30 million in 2019. The ratio of DALY for mental disorders to all disorders has risen from 1.3% to 9.4% between 1990 and 2019, showing that they are still one of ten leading causes of disease burden globally, with no evidence of a reduction since 1990 (3). Data from different countries show that five of the most severe health problems are related to mental disorders (2). One out of every four adults is estimated to be affected by a mental disorder, with 5% of people in society suffering from a severe mental disorder such as schizophrenia or bipolar disorder (4).

In the Eastern Mediterranean region, mental disorders cause 4.7% of the DALYs, and almost all countries in this region had higher DALY rates of mental disorders compared to the global average (1). In Iran, mental problems rank as the second most prevalent ailment behind accidental accidents. National surveys in Iran indicate that mental illnesses account for around 16% of

the overall disease burden. A study of mental disorders prevalence in Iran showed that 23.6% of Iranian population between the ages of 15 and 64 met the criteria of at least one DSM-IV mental disorder in the past 12 months. The 12-month prevalence of bipolar disorder, major depression, and any type of primary psychotic disorder were 12.7%, 1%, and 0.5%, respectively (7). Furthermore, mental diseases exert considerable societal and economic strains, including elevated healthcare expenditures, diminished output, and notable social difficulties. These effects highlight the essential need for efficient recovery-oriented therapies to mitigate individual distress and wider society expenses (8). While recovery from mental disorders is often considered to be a complex and time-consuming process, a person with severe mental illness could still recover, even if the disease is "untreated". Recovery-oriented service should include the belief that recovery is possible for people with mental illness (9). Considering the patients with schizophrenia spectrum or major mood disorders experience many limitations and disabilities throughout the disease course, efforts should be made to improve the patients' living conditions despite the presence of episodic symptoms. In other words, instead of focusing on eliminating the symptoms, we could focus on improving quality of life dimensions.

Since the patient is the best source for monitoring the changes during the disease course, self-report psychological well-being scales are crucial for a recovery-oriented evaluation (10). First, we need recovery criteria and measurement tools for its evaluation. In recent years, the studies on the development and implementation of recovery-oriented programs increased (10-12), and the necessity of evaluating recovery using standard self-report tools has been emphasized (13, 14). For the past two decades, researchers have endeavored to create a precise measurement instrument for mental health recovery. In order to evaluate the recovery of patients with severe mental illnesses, numerous instruments have been developed and reviewed in a systematic manner (15-17). Although there is no gold standard measurement tool, Recovery Assessment Scale (RAS) was the most commonly used scale in recovery-based studies (12, 18-20). For example, McNaught et al in Australia in 2006 (24), Chiba et al in Japan 2009 (25), Jorge-Monteiro and colleagues in Portugal 2016 (26), and Cavelti et al in German-speaking patients 2017 (27), have translated and psychometrically evaluated RAS in patients from various nations and cultural backgrounds (21-23). Validity and reliability of this scale was reported to be reasonably acceptable, with Cronbach's alpha coefficient higher than 0.7 in all these studies. Implementing recovery-oriented care in low-resource settings like Iran presents several challenges, including underfunded mental health services, cultural perceptions of mental illness, and systemic barriers within the healthcare infrastructure (28). Addressing these obstacles is essential for the successful adoption of recovery-oriented practices.

Among further modifications, Recovery Assessment Scale - Domains and Stages (RAS-DS) is a well-developed, evaluated, systemically reviewed and widely used scale that was revised and developed during a collaborative process with the patients, which has showed good reliability and validity in some studies (20, 29). Due to its comprehensive evaluation of recovery across multiple domains and stages, its collaborative development that included patient input, and its demonstrated applicability across diverse cultural contexts, the RAS-DS was chosen over other recovery scales (28). Consequently, it is particularly well-suited for adaptation to the Iranian setting. Comparatively, other instruments may not encompass the full spectrum of recovery experiences or may lack validation in varied cultural environments, thereby limiting their applicability in Iran. Considering the lack of self-report psychometric questionnaires in Persian language, which can measure the recovery of patients with severe mental disorders comprehensively in a short time, this study was designed to translate and evaluate the validity and reliability of RAS-DS in the patients with schizophrenia and major mood disorder in Iran.

2. Materials and Methods

2.1 Ethical considerations

The participants entered the project after signing informed consent. All the patients were given sufficient information about the research process and goals. This study contained no intervention, and participants were reminded that it was not mandatory to participate in this research. The psychiatrist was responsible for addressing any distress or adverse reactions during the sessions to ensure the safety of the participants. Furthermore, there were no repercussions for participants who chose to suspend or withdraw at any time. We kept patients' data confidential and only reported anonymous findings based on project objectives. The proposal of study was reviewed in the ethics committee of Iran University of Medical Sciences, and was approved with the review board license number: IR.IUMS.FMD.REC.1399.206.

2.2 Preparation of the Persian version of RAS-DS Questionnaire

The English text of RAS-DS and its manual was downloaded from*https://ses.library.usyd.edu.au › bitstream › RAS-DS_MANUAL_V2_2016*. First, two psychiatrists translated the questionnaire into Persian independently. Two translations were compared in a working group, including two psychiatrists and the project executive assistant. Then, a native English person translated the Persian version back into English. The translated text in English and the original text were compared, and translation errors were corrected. Persian translation was developed according to the results of this adaptation. The final translation was rechecked in the working group to discuss the cultural aspects of recovery and from a literary point of view. The psychiatrists established the inclusion of each question using the content validity ratio (CVR) according to the Lawshe approach. A threshold CVR score of 0.6, recommended

for a panel of three evaluators, was used. Discrepancies among reviewers were addressed by debate and agreement within the working group. This preliminary questionnaire was given to three psychiatrists to determine how crucial each question was to be included in the questionnaire. For the questions, the content validity ratio was calculated based on Lawshe method (30). They reviewed the clarity and relevance of questions to the general topic of questionnaire on a five-point Likert scale. The average score of 0.8 for each question was considered acceptable. Based on these results, the final Persian version of RAS-DS was prepared, and given to 10 patients with schizophrenia, bipolar disorder type I, and major depressive disorder to determine whether the questions were understandable by them. The finalized questionnaire was used in the study (supplementary file).

2.3 Questionnaires used in this study

2.3.1 Recovery Assessment Scale: Domains and Stages (RAS-DS)

RAS-DS is a self-report tool using 38 items to measure the personal perception of mental health recovery in four domains, which are "Doing things I value", "Looking forward", "Mastering my illness," and "Connecting and belongings". The response to each item could be chosen from "untrue", "a bit true," "mostly true," and "completely true." Each domain can be used and scored separately. RAS-DS was first developed in Australia by Hancock and colleagues in 2015, as a modified version of RAS questionnaire, with a high internal validity (0.42 to 0.70), reliability (0.93 to 0.98), and a Cronbach's α of 0.96. They developed this scale as a self-report instrument of recovery to facilitate collaborative, recovery-oriented practice and measure recovery-focused outcomes (20).

2.3.2 The World Health Organization Quality of Life-Brief Version (WHOQOL-BREF)

WHOQOL-BREF is a 26-question self-report questionnaire. The initial two inquiries evaluate a person's general health and overall quality of life, while the subsequent 24 items evaluate four health domains: physical health, psychological health, social relationships, and environmental quality of life over the past four weeks (31). Persian translation of this questionnaire was developed by Yousefi et al., in which the Cronbach's alpha coefficient was reported more than 0.8, which is considered a psychometrically acceptable tool to evaluate the quality of life in an Iranian population (32).

2.3.3 Depression-Anxiety-Stress Scale 21 (DASS-21)

DASS-21 is a self-report 21-question scale, with seven questions in each of three subscales, which are rated on a 4-point Likert scale (33). Asghari et al. developed Persian translation of this questionnaire in Iranian patients, that showed Cronbach's alpha coefficient of 0.94 for the whole questionnaire, and more than 0.85 for each of the depression, anxiety and stress subscales (34).

2.3.4 Brief Psychiatric Rating Scale (BPRS)

This scale contains 18 questions measuring psychotic, and non-psychotic symptoms in people with a psychiatric disorder, especially schizophrenia. Each symptom is evaluated on a seven-point scale ranging from one (none) to seven (the most), based on the clinical observations of a specialist during the interview (35). We used the scoring categorization of Leucht et al., in our study, in which a BPRS total score of 31, 41, and 53 were considered as mildly ill, moderately ill, and markedly ill, respectively (36).

2.3.5 Structured Clinical Interview for the DSM-5 (SCID-5)

This semi-structured interview provides diagnoses due to DSM-5 clinical version (SCID-5-CV). The Persian version of this instrument was developed by Shabani et al., who demonstrated that the kappa criterion was greater than 0.4 for all diagnoses except anxiety disorders. The sensitivity of all diagnoses was reported to be greater than 0.80, suggesting that they are a desirable characteristic in the diagnosis of disorders (37).

2.4 Participants

Inclusion criteria consisted of reading and writing literacy and physical ability to complete the tests, besides confirmed diagnosis and signed informed consent. All included cases were above eighteen years of old. Based on DSM-5 definition, schizophrenia spectrum disorders consist of schizophrenia, other psychotic disorders, and schizotypal personality disorder. However, schizotypal personality disorder was excluded, in addition to psychotic disorders caused by drug use, withdrawal, or other medical diseases, which were also excluded from the study. Additionally, patients who were in the acute phase of medication treatment, had disorganized thinking or speech, or had a reduced level of consciousness were excluded. Questionnaires that exhibited an incompleteness rate of more than 15% were excluded from the investigation. The diagnosis of disorders was confirmed by the project executive assistant based on SCID-5 in the initial diagnostic consultation and if necessary, was re-evaluated on the day of instruments´ completion. A sampling of cases was done from the hospitalized and outpatients referred to Iran Psychiatric Hospital from May 2021 to December 2022. Eligible cases were selected to enter the study in the last two days of hospitalization or within ten days after discharge. Additionally, outpatients who often attended the hospital's mental clinic were identified. In addition to the Brief Psychiatric Rating Scale (BPRS) in the first session, patients filled out a demographic information datasheet, the WHO quality of life questionnaire-brief form (WHOQoL-BREF), the Depression, Anxiety, Stress Scale (DASS-21), and the RAS-DS. Participants filled in the questionnaires in a quiet room, alone or in presence of a family member upon their request. After completing the questionnaires, the executive assistant controlled the completeness of questionnaires.

To determine the sample size, we considered a significance level (Type I error) of 0.05 and a power level

(Type II error) of 0.2. To detect a significant Pearson's correlation coefficient of 0.25, a minimum of 124 participants were required. Accounting for a 10% probability of sample dropout, we aimed to enroll at least 140 participants for the study. Twenty individuals willing to continue participating were selected to complete RAS-DS and WHOQoL-BREF for follow-up evaluation two to four weeks later.

2.5 Data analysis

SPSS-26 software was used for data analysis. Descriptive statistics included mean (±standard deviation), median (range of changes), frequency, and percentages. A normal distribution of the data was assessed using the Kolmogorov-Smirnov one-sample test. Spearman's correlation coefficient, which is more resilient to non-parametric data than other tests like Kendall's tau, was used to ascertain the relationship between RAS-DS scores and quality of life and mental symptoms since these scores deviated from a normal distribution. The internal consistency of instrument was determined using Cronbach's alpha coefficient. In all cases, $p<0.05$ was considered statistically significant.

3. Results

142 patients (81 male, 61 female) participated with an average age of 35.4 (± 9.2) years (median 34.5 years, range 19 to 63 years). (Tables 1 and 2) show the demographic and clinical characteristics of participants. The average duration of illness was 8 years (0.1-33). About one-third of the cases had clinical diagnoses of schizophrenia and schizoaffective disorder (n= 47), one-third bipolar disorder type 1 (n= 49), and one-third major depressive disorder (n= 44) (Table 2). Table 3 shows the statistical description of questionnaires used in the study. Despite the sample's diversity, it is generally typical of patients visiting metropolitan psychiatric clinics in Iran, hence augmenting the generalizability of the results. All domains of RAS-DS had a positive and significant correlation with different domains of quality of life (WHOQoL-BREF). These scores showed a negative and significant correlation with the intensity of depression, anxiety, and stress (DASS-21). These correlations suggest that RAS-DS effectively captures recovery dimensions linked to subjective well-being and quality of life. However, except for the fourth domain (Connecting and belongings), the scores of other RAS-DS domains and the total score were not correlated with the severity of psychopathology according to BPRS (Table 4). This lack of correlation suggests that RAS-DS may predominantly denote personal recovery and subjective well-being, rather than clinical symptom severity. Further investigation is warranted regarding the function of the "Connecting and belongings" domain in the intersection of subjective recovery and clinical symptoms. All domains of RAS-DS had a positive and significant correlation with each other and the total score of the questionnaire (Table 5).

Cronbach's alpha coefficient for RAS-DS was calculated as 0.960 for the whole questionnaire and 0.835, 0.944, 0.881, and 0.815 for its four domains, respectively. In none of the domains, removing any specific question resulted in a significant increase in the alpha coefficient or the variance of domain. The correlation coefficient between the score of each question and the total score of questionnaire was ranged from 0.246 (question 35) to 0.791 (question 26). Each question had an average score of 1.02, and the average variation of the scores was 0.048 (Table 6). The results of the first and second assessments (test-retest reliability) demonstrated a positive and substantial connection in every RAS-DS area. However, in the third and fourth domains, as well as the entire questionnaire, the score of the second evaluation was significantly higher than the first evaluation (Table 7).

Table 1. Demographic characteristics of 142 participants

		Frequency	Percentage
Sex	Male	81	57.0
	Female	61	43.0
Marital status	Single	89	62.7
	Married	39	27.5
	Divorced	5	3.5
	Widow(er)	8	5.6
	Unknown	1	7.0
Level of Education	Illiterate	0	0
	Elementary and middle school (sub-diploma)	41	28.9
	High school diploma	57	40.1
	University degree	42	29.6
	Unknown	2	1.4
	Homeless	1	0.7

		Frequency	Percentage
Housing status	Dormitory resident	3	2.1
	House (rented or personal)	136	95.8
	Unknown	2	1.4

Table 2. Clinical characteristics of 142 participants

		Frequency	Percentage
Clinical diagnosis	Schizophrenia and schizoaffective disorder	47	33.1
	Bipolar disorder type 1	49	34.5
	Major depressive disorder	44	31.0
	Unknown	2	1.4
Duration of illness (years)	Median (range)	8 (0.1-33)	
	Under one year	5	3.9
	Between one and three years	25	17.6
	Between three and ten years	37	26.1
	Ten years and above	62	43.7
	Not determined	13	9.2
Number of hospitalizations	Median (range)	8 (0-28)	
	No hospitalization history	22	16.4
	Once	25	17.6
	Two times	29	20.4
	Three times	20	14.1
	Four times or more	38	26.8
	Unknown	8	5.6
Interval from the last hospitalization (months)	Median (range)	10 (0.216)	
	Under one year	6	4.2
	One to two years	13	9.2
	Two years and above	73	51.4
	Unknown	50	35.2
Insurance coverage	Yes	126	88.7
	No	15	10.6
	Unknown	1	0.7

Table 3. Statistical description of the used questionnaires. RAS-DS: Recovery Assessment Scale – Domains & Stages, WHOQoL-BREF: WHO Quality of Life – Brief Form, DASS-21: Depression Anxiety Stress Scale, BPRS: Brief Psychiatric Rating Scale

Tool	Subscales	Mean ± standard deviation	Median (range)
RAS-DS	d1 (Doing things I value)	78.7 ± 17.6	88.3 (25-100)
	d2 (Looking forward)	79.0 ± 18.1	82.6 (25-100)
	d3 (Mastering my illness)	73.8 ± 20.0	75.0 (25-100)
	d4 (Connecting and belongings)	72.9 ± 19.3	75.0 (25-100)
	Total score	116.8 ± 25.5	122.0 (38-152)
	General	64.8 ± 25.0	62.5 (0-100)
	Physical	54.2 ± 15.2	53.6 (25.0-96.4)

Tool	Subscales	Mean ± standard deviation	Median (range)
WHOQoL-BREF	Psychological	56.5 ± 17.0	58.3 (12.5-91.7)
	Environmental	57.5 ± 20.1	56.3 (9.4-100)
	Social	51.6 ± 25.2	50.0 (0-100)
	Total score	56.3 ± 15.8	55.3 (19.0-95.2)
DASS-21	Depression	7.8 ± 5.9	8 (0-21)
	Anxiety	6.7 ± 5.1	6 (0-21)
	Stress	8.7 ± 6.0	8 (0-21)
BPRS		33.4 ± 9.5	33 (19-75)

Table 4. Spearman's correlation coefficients between the scores of different domains of the Recovery Assessment Scale - Domains and Stages (RAS-DS) with quality of life and psychiatric symptoms. Except the cases shown in parentheses, p < 0.001 in all cases. RAS-DS: Recovery Assessment Scale – Domains & Stages. WHOQoL-BREF: WHO Quality of Life – Brief Form. DASS-21: Depression Anxiety Stress Scale. BPRS: Brief Psychiatric Rating Scale

Tool	Subscales	Different domains of the Recovery Assessment Scale - Domains and Stages (RAS-DS)				
		d1 (Doing things I value)	d2 (Looking forward)	d3 (Mastering my illness)	d4 (Connecting and belongings)	Total score
WHOQoL-BREF	General	0.560	0.533	0.502	0.411	0.559
	Physical	0.656	0.698	0.602	0.494	0.700
	Psychological	0.446	0.529	0.485	0.495	0.550
	Environmental	0.437	0.567	0.528	0.528	0.592
	Social	0.434	0.552	0.497	0.450	0.548
	Total score	0.620	0.704	0.641	0.595	0.726
DASS-21	Depression	-0.525	-0.671	-0.615	-0.519	-0.678
	Anxiety	-0.258 (P=0.002)	-0.487	-0.411	-0.341	-0.449
	Stress	-0.356	-0.483	-0.408	-0.293	-0.455
BPRS		-0.085 (P=0.317)	-0.096 (P=0.257)	-0.036 (P=0.672)	-0.187 (P=0.026)	-0.121 (P=0.151)

Table 5. Spearman's correlation coefficients between the scores of different domains of the Recovery Assessment Scale - Domains and Stages (RAS-DS) with each other and with the total score of the questionnaire (in all cases: p < 0.001)

	d1 (Doing things I value)	d2 (Looking forward)	d3 (Mastering my illness)	d4 (Connecting and belongings)	Total score
d1 (Doing things I value)		0.705	0.666	0.599	0.798
d2 (Looking forward)			0.846	0.702	0.956
d3 (Mastering my illness)				0.710	0.914
d4 (Connecting and belongings)					0.826

Table 6. Correlation of questionnaire questions with the total score and changes in variance and Cronbach's alpha coefficient when the question is removed.

Question number	Correlation with total score	Variance of the questionnaire if the question is removed	Alpha coefficient of the questionnaire if the question is removed
1	0.343	577.43	0.960
2	0.445	575.14	0.959
3	0.718	555.51	0.958
4	0.621	557.50	0.959
5	0.538	562.88	0.959
6	0.658	557.62	0.958
7	0.573	561.53	0.959
8	0.730	554.89	0.958
9	0.453	576.16	0.959
10	0.559	576.24	0.959
11	0.771	553.89	0.958
12	0.599	560.44	0.959
13	0.701	556.15	0.958
14	0.634	561.87	0.959
15	0.601	560.15	0.959
16	0.648	561.85	0.958
17	0.650	556.55	0.958
18	0.672	559.19	0.958
19	0.664	562.54	0.958
20	0.748	551.60	0.958
21	0.603	562.19	0.959
22	0.630	561.09	0.959
23	0.672	560.60	0.958
24	0.675	557.54	0.958
25	0.425	569.64	0.960
26	0.791	550.43	0.958
27	0.697	557.12	0.958
28	0.590	566.90	0.959
29	0.704	553.01	0.958
30	0.749	551.16	0.958
31	0.638	554.17	0.958
32	0.588	560.77	0.959
33	0.598	559.15	0.959
34	0.459	566.01	0.960
35	0.246	575.40	0.961
36	0.435	566.96	0.960
37	0.657	555.03	0.958
38	0.679	557.59	0.958

Table 7. Test-retest reliability of different domains of the Recovery Assessment Scale - Domains and Stages (RAS-DS) in the interval of two to four weeks. The scores are reported as mean ± standard deviation.

	First score	Retest score	Average difference of two evaluations	Paired t test		The correlation coefficient	
				t	p	r	p
d1 (Doing things I value)	78.2 ± 16.0	83.0 ± 15.3	(-4.8) ± 12.8	-1.678	0.110	0.668	0.001
d2 (Looking forward)	79.4 ± 17.4	84.3 ± 16.0	(-4.9) ± 13.1	-1.677	0.110	0.697	0.001
d3 (Mastering my illness)	74.3 ± 20.9	83.1 ± 19.9	(-8.9) ± 15.5	-2.510	0.021	0.701	0.001
d4 (Connecting and belongings)	79.5 ± 17.1	86.8 ± 15.7	(-7.3) ± 13.9	-2.351	0.030	0.643	0.002
Total score	119.0 ± 25.3	128.3 ± 22.1	(-9.4) ± 18.3	-2.296	0.033	0.711	0<0.001

4. Discussion

We prepared the Persian translation version of self-report questionnaire RAS-DS. We evaluated the validity and reliability to assess recovery for the patients with schizophrenia spectrum disorders, and major mood disorders. Based on our findings, the translated Persian version of RAS-DS questionnaire has appropriate face and content validity, and the test-retest reliability of the questionnaire was at an acceptable level, as in all domains, the scores of the first and second evaluations showed internal consistency. The second evaluation's better scores, especially in the third and fourth categories, however, emphasize the need of a methodical study of condition modifications or other variables impacting these outcomes; for instance, they could point to a familiarization or learning effect. Future research should look at this and accept it as a shortcoming. The higher score of the third and fourth domains of questionnaire and total score in the second evaluation (retest) could be attributed to the long interval between the first and second evaluations resulting in condition changes since the first evaluation in hospitalization. The management of disease symptoms in the second evaluation could also be another reason. In our study, all domains of RAS-DS significantly correlated with each other and total questionnaire score. The alpha coefficient above 0.7 in our study indicates the internal consistency of the translated questionnaire. It also demonstrates that the domains of the questionnaire are not independent from one another, as the alpha coefficient and variance of a specific domain would not be substantially enhanced by the removal of a specific question in any field. In other words, all inquiries are pertinent to the assessment's objective and its outcome. Various tools were used in different studies to measure the correlation with RAS-DS. In our study, we used WHOQoL-BREF, DASS-21, and BPRS for this purpose. We found significant correlations for all domains of RAS-DS with different domains of the quality of life (WHOQoL-BREF), and with the severity of depression, anxiety, and stress scales (DASS-21). However, RAS-DS total score was not correlated with the severity of psychopathology based on the BPRS. This suggested that a patient's perception of recovery might not be influenced by the severity of the disorder, indicating the need for additional research to explore this relationship. In contrast, the absence of correlation with the BPRS emphasizes the significance of distinguishing subjective recovery, as assessed by self-report instruments such as the RAS-DS, from clinical symptomatology. This discovery may indicate that self-report instruments offer complementary insights and should not be exclusively utilized for a comprehensive recovery assessment. Hancock et al. evaluated the feasibility, acceptability and measurement features of RAS-DS in youth mental healthiness services in 2020. Then, both clients and clinicians provided feedback on its usefulness. Fifty-eight client-physician couples participated, and analyzes showed that RAS-DS items corresponded well with the expectations. This study shows that the RAS-DS has acceptable measurement properties for youth and clinicians **(38)**. Hancock et al. also demonstrated exceptional internal validity for the RAS-DS in a separate study. The point correlation was positive for all cases and ranged from 0.42 to 0.70. The reliability indexes of patients and items were 0.93 and 0.98, respectively, and the Cronbach's alpha coefficient was 0.96 **(20)**. In our study, Cronbach's alpha coefficient for RAS-DS was calculated 0.960 for entire questionnaire, and 0.835, 0.944, 0.881, and 0.815 for its four domains, respectively, indicating the translated questionnaire has a high internal consistency. Scanlan et al. in 2018 investigated the convergence validity and sensitivity to change overtime in RAS-DS test and Camberwell Assessment of Need - Short Appraisal Scale (CANSAS). Their results showed a moderate and significant correlation between RAS-DS total and domain scores and CANSAS scores. The results of this study show that RAS-DS was sensitive to identify changes in long term. On the other hand, the relative correlation between CANSAS and RAS-DS shows that self-report recovery measurement should be considered important in providing recovery-based services **(39)**.

Our results are consistent with these studies, indicating that RAS-DS is not only culturally adaptable to the Iranian population but also reliable. However, future research should take into account the unique sociocultural factors that influence recovery perceptions in non-Western contexts. Recovery from a disease or disability does not always imply the elimination of all symptoms and the full restoration of complete function. (40). The concept of recovery therefore is creating a fulfilling life and well-being feeling despite concurrent limitations (41). People who experience severe psychiatric symptoms episodically may recover (42); however, recovery from mental disorders is often complex and time-consuming (43). It is clear that to improve the recovery and recovery-oriented interventions assessment, there is a need for valid and reliable tools to measure meaningful and practical outcomes for patients and healthcare providers. Over the past two decades, researchers have been trying to create a precise measurement instrument for assessing mental health recovery (20). These evaluations should be capable of directing the intervention and identifying the patient's improvement or any domain that has the potential for recovery. Additionally, it should establish the context for initiating discussions between patients and employees and propose potential avenues for collaboration (44). By addressing the gaps in recovery-oriented assessment tools available in Iran, our study contributes to filling a critical void in the mental health care framework. Since there was no such possibility in Iran, this study was done to develop and use Persian version of RAS-DS in evaluating patients' recovery, and performing appropriate interventions for them. Considering acceptable reliability and validity, as well as the internal consistency of Persian translation for the RAS-DS in this study, it is suggested that colleagues in future studies use this tool to investigate and improve the situation of Iranian patients with schizophrenia spectrum disorders and major mood disorders. Future study options might include longitudinal studies to assess recovery trajectories, adaption for different Persian-speaking groups, and integration with other objective performance metrics. Conducting similar studies allows for assessing recovery for the patients with severe mental disorders. The results of such analyses can be used to improve patients' health care and inform healthcare decision-makers about their current situation, as well as the possibility of comparing the outcomes with the studies of other countries.

Limitation

Since this study was conducted in a single specialized psychiatric hospital, subjects might not necessarily reflect all patients, as they tend to have more severe symptoms compared with the general population of patients. This restricted the generalizability of our findings to a more extensive Iranian population with severe mood disorders and schizophrenia spectrum disorder. In order to improve representativeness, future research should incorporate a more diverse sample that encompasses a variety of psychiatric settings and community-based care facilities. On the other hand, as the study coincided with COVID-19 pandemic, our ability to conduct clinical examinations and administer other questionnaires was constrained. Consequently, we relied on above-mentioned questionnaires that could be considered a limitation of our study. In addition, the translation process may have introduced subtle biases that necessitate further investigation in subsequent studies, as a result of the challenges encountered, such as assuring cultural and linguistic equivalence. We therefore suggest correlation assessment of this tool with the clinical and objective performance tools, for instance Mini-Mental State Examination (MMSE) and Positive and Negative Syndrome Scale (PANSS) in the future studies. Besides, during the process of psychometric tools evaluation in a new language, it is possible to discover the factor structure of that tool in the same study or test it in other studies. Owing to the insufficient sample size for conducting both exploratory and confirmatory analyses, we restricted our investigation to exploratory analysis, which may be seen as a drawback of our work. Future research should analyze the confirmatory factor analysis of the instrument. Moreover, the sample size for follow-up evaluation (n=20) was relatively small, which could affect the robustness of test-retest reliability results. Future research should aim for larger follow-up cohorts to validate the consistency of findings over time. We should consider that the ability of researchers to evaluate the various aspects of one instrument´s validity is limited and like most other validity evaluations cannot be done adequately in one study. We therefore suggest examining the validity of this tool from different perspectives, such as differential validity, in the upcoming assessments.

5. Conclusion

Based on this study, the Persian translation of RAS-DS questionnaire has good reliability and validity, as well as acceptable internal consistency (Cronbach's alpha= 0.960). All domains of the Persian version of RAS-DS had a positive and significant correlation with each other and the total score of the questionnaire. This version of RAS-DS demonstrated a positive and substantial association with several areas of quality of life (WHOQoL-BREF), as well as a negative and significant correlation with the severity of depression, anxiety, and stress scales (DASS-21). However, except for the fourth domain (Connecting and belongings), the scores of other RAS-DS domains, and the total score were not correlated with the severity of psychopathology according to the BPRS. Researchers could therefore investigate recovery process of Iranian patients with schizophrenia spectrum disorders and major mood disorders using this translated version of the tool.

6. Declarations

6.1 Acknowledgments

Not applicable.

6.2 Ethical Considerations

The proposal of the study was reviewed by the ethics committee of Iran University of Medical University and was approved with the review board license number: IR.IUMS.FMD.REC.1399.206.

6.3 Authors' Contributions

Conceptualizing he study, analaysing the data: Kaveh Alavi.

Managing the overall research process: Kaveh Alavi, Amir Hossein Jalali Nadoushan.

Data collection: Fatemeh Banihashemian, Maryam Rafieian Koopaiee, Tara Rezvankhah, Kaveh Alavi.

Drafting the manuscript or revising it critically for important intellectual content: Fatemeh Banihashemian, Amir Hossein Jalali Nadoushan, Mahdi Safdarian, Maryam Rafieian Koopaiee, Tara Rezvankhah, Kaveh Alavi

Providing data or critical feedback on manuscript: Fatemeh Banihashemian, Amir Hossein Jalali Nadoushan, Mahdi Safdarian, Maryam Rafieian Koopaiee, Tara Rezvankhah, Kaveh Alavi.

All authors had full access to all the data in the study and had final responsibility for the decision to submit for publication.

6.4 Conflict of Interest

The authors declare that there are no conflicts of interest.

6.5 Fund or Financial Support

This research received no specific grant from any funding agency in the public, commercial, or not for profit sector.

6.6 Using Artificial Intelligence Tools (AI Tools)

The authors were not utilized AI Tools.

6.7 Informed consent

The participants entered the project after signing informed consent form. All the patients and one of their caregivers were given sufficient information about the research process and its goals.

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