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Measurement of mental health recovery knowledge and attitudes of professionals and students: development of the R-KAS tool

Naomi Badu[1,3*], Nicola Schutte[2], Kylie Rice[2], Md. Shahidul Islam[1] and Kim Usher[1]

Abstract

Background The Recovery Knowledge Inventory (RKI) has been used widely across various settings to measure mental health professionals' and students' knowledge and attitudes about recovery. However, evidence suggests that this measure lacks sound psychometric properties and may not fully capture the multidimensional nature of recovery. This study aimed to adapt and establish the psychometric properties of a modified version of the RKI, resulting in both a long and a short version.

Methods An exploratory sequential mixed-method design was employed in this study. In the first phase, qualitative interviews were conducted using a semi-structured guide to explore participants' understanding of mental health recovery. Their responses informed the development of a new survey tool used in the second phase. In total, 173 respondents were recruited via Qualtrics to complete an online survey. Descriptive and inferential statistics were conducted, including exploratory factor analysis, reliability analysis, Spearman correlation, and the Mann–Whitney U test.

Results The 52 self-reported items were administered to 115 professionals and 58 students to assess the psychometric properties of this adapted measure. Exploratory Factor Analysis resulted in the removal of 14 items with low factor loadings, retaining 38 items in the long version of the newly adapted measure, the Recovery Knowledge and Attitude Scale (R-KAS). Also, a short 21-item version was developed. Both versions consist of three subscales namely *Competence, Roles, and Responsibilities,* and *Process*. Both the long and the short versions had good to excellent factor loadings (range .60 to.81) and high reliability (Cronbach's alpha 38 items; $\alpha = 0.95$, 21 items, $\alpha = 0.93$). Known-groups validity was supported, as professionals who had received mental health recovery training scored significantly higher than those who had not.

Conclusions Adapted from the original RKI and refined with input from consumers, the newly developed R-KAS tool appears to be psychometrically sound for assessing recovery knowledge and attitudes among professionals and students. Initial findings indicate that the R-KAS is a reliable and valid measure that may better reflect recovery-oriented practices in contemporary mental health settings.

Keywords Recovery knowledge inventory, Mental health recovery, Mental health professionals, Students, Recovery Knowledge and Attitude Scale (R-KAS)

*Correspondence:
Naomi Badu
ngyamfi2@une.edu.au; naomi.gyamfi@yahoo.com
Full list of author information is available at the end of the article

Background

The concept of recovery arose from the lived and living experience of people with mental health problems [1–3]. It has since been shaped and reshaped through the review and comparison of perspectives of consumers and professionals [4, 5]. Mental health policy in many countries emphasises the need for services to adopt a 'recovery orientation' to improve service users' experiences and outcomes [6–8]. For example, in Australia, this priority is reflected through the Australia National Mental Health Policy, which targets the promotion of recovery from mental illness and mental health problems [9].

Recovery can be defined as a complex personal process of developing new meaning and purpose in life even against the catastrophic effects of mental illness [10]. Specifically, it is an individualized, subjective, and multifaceted process consisting of internal and external conditions such as building hope, self-identity, finding meaning in life, and social inclusion [11]. The achievement of recovery is related to living a self-directed life, improving health and well-being, and striving to reach maximum potential [6, 10]. This conceptualisation of recovery contrasts with the biomedical view of mental health care, which focuses on symptom reduction and functioning [12].

Both health system reforms and evidence-based practice require data to support and measure progress, including understanding concepts [13–15]. Therefore, some knowledge and attitude recovery-based measures have been developed [16, 17]; however, evidence suggest that many lack sound psychometric properties [17, 18]. For example, the Recovery Knowledge Inventory [RKI] is the most common tool used to assess the knowledge and attitude of professionals regarding mental health recovery. However, existing psychometric testing of the original RKI indicates that two constructs/components had low factor loadings, which fall below the acceptable threshold [18]. Also, psychometric testing in different settings finds inconsistent factor structure [19–22]. Previous studies suggested the need to redevelop the RKI to improve its psychometric properties and its application in measuring knowledge and attitudes of professionals.

Also, the recovery concept recognises consumers as experts of their health. Therefore, it has been recommended that consumers be fully involved in all aspects of the service delivery system, including training, service design, delivery, evaluation, and research [23, 24]. Despite this, a recent review of recovery measures showed that consumers are mostly excluded from the development of the measures or the conceptual construction that underpins the measure [18]. Furthermore, there is growing evidence of the importance of a therapeutic relationship in predicting consumers' outcomes [25–28]. Recovery-oriented professionals are defined as those who can deal with the complexities and the individuality of the change process as well as work in a collaborative partnership with the consumer [26]. According to consumers, finding someone helpful was a major turning point for recovery [25, 26]. Despite the importance of the therapeutic relationship in consumers' recovery, many of the recovery-oriented measures do not include items that measure this important concept [18].

With recovery shifting away from the dominant biomedical conceptualisation, professionals'knowledge and attitudes are key in translating recovery principles to practice. For example, professionals attitudes have been identified as important in shaping environments that facilitate recovery [16, 17]. Given this, professionals knowledge and attitude have become important areas of assessment and improvement.

The RKI Scale for measuring knowledge and attitudes about recovery

The Recovery Knowledge Inventory (RKI) [17] is the most widely used scale for the assessment of professionals knowledge and attitudes regarding recovery [19–22]. The scale consists of four underlying dimensions (Roles and Responsibilities in Recovery, Non-linearity of the Recovery Process, The Roles of Self-definition and Peers in Recovery, and Expectations Regarding Recovery) used to measure professionals knowledge and attitudes regarding recovery. In addition to the initial validation of the tool, several studies have translated and assessed the psychometric properties of the RKI in different samples [20–22, 29–38] The factor structure of both the translated versions [29, 30] and the original scale [20, 36] in subsequent studies did not fit the four-factor solution identified in the original study [17]. In addition, almost all the other studies that assessed the internal consistency of the scale recorded lower values for the fourth factor. The measure also does not have items that assess therapeutic relationship, which omits an important aspect of recovery.

Furthermore, the extent of consumer involvement in the conceptualisation and development of the RKI measure is generally unknown. These points all lend support to a revision of the original scale to improve the psychometric properties and incorporate all of the important aspects of recovery in its assessment. It is of paramount importance that consumers and caregivers are included in the development of items and subscales to ensure the assessed components are representative of the lived experience of recovery. A revision is consistent with the ongoing evaluation of the scale that was requested by the original developers [17], who considered the scale to be in preliminary form and recommended further

development and replication of the tool to expand knowledge on recovery and ensure effective implementation of recovery-oriented principles.

This study aims to review and revise the RKI as part of the ongoing effort to develop a psychometrically sound tool for measuring mental health recovery among professionals. Collaboratively involving professionals, consumers, and caregivers in the conceptualisation and development of the items is central to this aim. A second aim was to develop a brief version of the scale with good psychometric properties that could have utility in routine service monitoring. The study tested two hypotheses; (1) It was hypothesised that both the long and short versions of the new scale would have good internal consistency. (2)It was also hypothesised that both the long and short versions of the new scale would show evidence of validity. Validity would be indicated by mental health professionals who had had mental health recovery training showing higher scores. Also, years of experience in the mental health field would be associated with higher scores.

Methods

This study included two distinct phases 1) the revision of the Recovery Knowledge Inventory (RKI) and the development of the adapted version of the scale, the R-KAS, and 2) data collection for the initial psychometric testing of this new version. The study used a sequential mixed method design to adapt the scale.

The development of The Recovery Knowledge and Attitude Scale (R-KAS) (Qualitative study)

A consent to adapt the RKI Scale was obtained from the original developers. The scale was developed from a three-staged approach. First, the researchers conducted three literature reviews to broadly understand the concept and theories of recovery and the available tools used to measure the concept [11, 18, 39]. Based on the gap in the literature, in terms of knowledge and attitudes, from consumers, carers, and professionals perspectives, an in-depth guide was developed to explore further on professionals and students'knowledge and attitudes. This was the second phase (qualitative component) of the study. The participants for the qualitative component were Australian mental health professionals (three psychologists, five mental health nurses, and two social workers) with five years and over experience in the field of mental health, and eight final-year health students from an Australian regional university (two psychology students, three nursing students, and three social worker students).

The findings from qualitative interviews were generated as codes using Nvivo. A total number of 60 questionnaire items were generated from the codes. The project team first reviewed these questions and included those relevant to recovery concepts e.g. measure well-being or hope and optimism or autonomy or social inclusion, and Quality of life. Out of the 60 questions, an initial 54 items were approved as meeting the criteria.

The 54 codes/statements were shared with stakeholders which included consumers, as per best practices and previous literature to independently review the questions and provide feedback on the items. The stakeholders were then invited to participate in a Zoom meeting to review and reconcile the independent comments and feedback from the initial review. The meeting was held via Zoom because it happened at the time of COVID-19. This meeting specifically aimed to discuss the items that need to be included based on the preliminary review. The stakeholders made extensive contributions, in terms of the face validity of the items, and its implication on the lives of consumers. Based on the feedback and their professional expertise two items were deleted as they were not well-aligned with the recovery construct and other items were refined. The revised 52 items were included in the final survey for practitioners and students, along with demographic questions. The discussion helped to arrive at the draft Recovery Knowledge and Attitudes Scale (RKAS).

The stakeholders included three practitioners (two of whom were also caregivers), two consumers, two mental health academics, and a Ph.D. student who led the review and refinement of the questionnaire items, as well as the expert review process. The draft RKAS initially consisted of 52 items, with 27% negatively worded to minimise response bias. Consistent with the RKI, a five-point Likert response scale—Strongly Disagree, Disagree, Not Sure, Agree, and Strongly Agree—was utilised.

Evaluation of the RKAS Tool

Study participants sampling size and strategy

The study was conducted with Australian mental health professionals and health students at the University of New England (UNE). A convenience sampling method was used to recruit qualified social workers, psychologists, mental health nurses, as well as students in nursing, psychology, and social work at UNE. A sample size between 100 and 150 participants is generally considered acceptable for exploratory factor analysis (EFA) [40–42]. Per commonly used guidelines recommending a minimum of five participants per item [43], the required sample size was calculated as $5\times 52 = 260$. Nonetheless, a minimum threshold of 100 participants was maintained. Eligible students included those enrolled in master's or PhD programs, who were proficient in English and aged

18 years or older. Professionals recruited for the study were also required to be fluent in English.

Recruitment process

Following ethical approval, both practitioners and students were recruited to complete the Qualtrics survey. The survey was anonymous. No identifiable information was collected. To recruit qualified professionals, the study was advertised through professional organisations for psychology, nursing, and social work, and promoted on their social media platforms, as well as via email invitations. Undergraduate students in their final year of study and post-graduate students (all levels) in nursing, psychology, and social work were invited to participate through an advertisement on the online learning platforms. Informed consent was obtained from participants involved in the study before they completed the Qualtrics Survey. A total of 233 respondent field out the self-reported survey.

Ethical compliance

The researchers obtained ethical approval from the host university before data collection (HREC# HE21-260). The original developers of the RKI gave consent for the tool to be adapted. All data were anonymous as no identifiable personal details were collected, and only aggregate data was reported. Involvement in the study was voluntary and participants were informed of their right to stop participating in the study at any time without consequence or the need for explanation.

Data analysis

The study used both descriptive and inferential statistics to analyse the data, IBM SPSS Statistics (Version 28). Cases were retained if they completed demographic information and all of the recovery items, and cases with missing values in the recovery items were deleted, resulting in 173 completed responses for analysis. The items were reverse coded where necessary, and the composite mean and standard deviation for the sub-scales and total score were computed. The Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity (BTS) [27] were used to examine the appropriateness of data to conduct Exploratory Factor Analysis (EFA).

In conducting the EFA exploratory, the scree plot was first used to determine the number of factors to extract. This followed a Maximum Likelihood Estimation analysis to extract optimal factors and loadings. The maximum likelihood approach is a more appropriate and preferred approach to correct non-response bias. It demonstrates efficient use of the information contained in the sample [44, 45]. In addition, an oblique promax rotation was used to rotate the factors. Spearman correlation tested associations between Recovery knowledge and years of professional experience. Correlation coefficients between ± 0.75 to 1 point were considered very good to excellent; ± 0.50 to 0.75 were considered moderate to good; ± 0.25 to 0.50 were considered as poor; and ± 0 to 0.25 indicated absence of correlation [46].

The data were not normally distributed therefore all the validity analyses were performed using a Mann–Whitney U test and spearman correlation tests. Previous studies have suggested that the Mann–Whitney U test is always used when the requirement of normal distribution for the t-test is not met [47, 48]. It is used to test if there are statistically significant differences between two groups on a single, ordinal variable with no specific distribution [47, 48]. Specifically, the Man U Whitney test analysis was performed to determine if there was a significant difference between the mean scores of professionals who have received training in recovery and those who had not. Also, the study assessed an association between years of experience in the mental health field and recovery knowledge and attitude among professionals. In the EFA, factor loadings thresholds of 0.6 (Cronbach's alpha $\alpha = 0.6$) and 0.7 was used to determine which factors need to be retained [49, 50].

Results

Demographics

A total number of 233 respondents were recruited using Qualtrics. Out of this number, 60 incomplete data were removed from the items. The analysis was therefore performed with 173 complete responses. The socio-demographic characteristics of participants are presented in Table 1. Of the total 173 respondents, 75.1% were female, the mean age was 43 years. Most participants (77%) had no personal lived mental health experience, although 59% of respondents had relatives with mental illness. Approximately 15% of participants identified as Aboriginal or Torres Strait Islanders. Of the professional respondents' group ($N = 115$), the majority (71.6%) were mental health nurses, and most (98%) had received training in mental health recovery at work (42.4%), or university (31.3%), or both (22%). For the trainee respondents ($N = 58$), the majority (84.5%) were domestic students with about half (53.4%) studying psychology. Most (70.9%) of them were final-year undergraduate students, and many of the students (51.7%) had not yet undertaken a field placement.

Structure of the scale

To examine the structure of the R-KAS, 150 responses were randomly selected and included in a maximum likelihood estimation with eigenvalues greater than 1. The initial estimation yielded 11 factors with eigenvalues over 1. However, an analysis of the screen plot

Table 1 Demographic information for participants

Variables	Student	Practitioners	Total
	N (%)	N (%)	N (%)
Gender			
Female	49(84.5)	81(70.4)	130(75.1)
Male	8(13.8)	34(29.6)	42(24.3)
Prefer not to say	1(1.7)	-	1(0.6)
Age (in years) *			
Under 27	19(33.3)	6(5.6)	25(15.2)
28–37	14(24.6)	24(22.2)	38(23.0)
38–47	11(19.3)	29(26.9)	40(24.2)
48–57	9(15.8)	23(21.3)	32(19.4)
58 and older	4(7.0)	26(24.1)	30(18.2)
Diagnosed with a mental illness			
Yes	27(46.6)	12 (10.5)	39(22.7)
No	31(53.4)	102(89.5)	133(77.3)
Relative with mental illness			
Yes	35(60.3)	36(31.3)	71(41.0)
No	23(39.7)	79(68.7)	102(59.0)
Aboriginal or Torres Strait Islander origin			
Yes	5(10.2)	20(17.7)	25(15.4)
No	44(89.8%)	93(82.3)	137 (84.6)
Educational qualification			
Diploma	-	9(7.8)	-
Bachelor	-	37(32.2)	-
Masters	-	47(40.9)	-
Doctorate		17(14.8)	
Other		5(4.3)	
Profession			
Social worker		14(12.1)	
Psychologist		18(15.5)	
Mental health nurse		83(71.6)	
Other		1(.9)	
Setting of work			
Inpatient unit		42(36.5)	
Outpatient unit		10(8.7)	
Community		59(51.3)	
Other		4(3.5)	
Years worked in mental health field			
10 and below		29(28.4)	
11–20		28(27.5)	
21–30		23(22.5)	
31–40		18(17.6)	
41 and above		4(3.9)	
Received training in mental health recovery			
Yes		98 (86.7)	
No		15 (13.3)	
Where did you receive the training			
Work		42(42.4)	
School		31(31.3)	
Work and school		22(22.2)	

Table 1 (continued)

Variables	Student	Practitioners	Total
Other		4(4.0)	
Discipline Enrolled if student			
Social work	10(17.2)		
Nursing	17(29.3)		
Psychology	31(53.4)		
Year enrolled			
Final year Undergraduate	39(70.9)		
Masters level	15(27.3)		
Ph.D. level	1(1.8)		
Field attachments/placements completed			
One	13(22.4)		
Two	5(8.6)		
Three	10(17.2)		
Other()	30(51.7)		
Employment status			
Employed full-time	14(24.1)		
Employed part-time	27(46.6)		
Unemployed and looking for work	3(5.2)		
Unemployed and not looking for work	2(3.4)		
Retired	1(1.7)		
Self-employed	1(1.7)		
Unable to work	2(3.4)		
other	8(13.8)		
Area of employment			
Nursing and aged care	12(27.3)		
Mental health and disability	6(13.6)		
Social work	9(20.5)		
Paramedic	2(4.5)		
Educational sector	6(13.6)		
Other	9(20.5)		
Years worked in the field			
10 and below	39(78.0)		
11–20	7(14.0)		
21–30	2(4.0)		
31–40	1(2.0)		
41 and above	1(2.0)		
International student status			
Yes	9(15.5)		
No	49(84.5)		

*Age – minimum 18, maximum 72 (m = 43.01; sd =,13.73)

showed the first three factors accounted for most of the variance. It was concluded that Kaiser's criterion overestimated the number of components retained. This indicated that the current structure was not an optimum representation of the internal structure of the scale. A subsequent Maximum likelihood estimation, with Promax rotation analysis, was performed with the 150 randomly selected responses. Testing of assumptions revealed the adequacy of the dataset to conduct a factor analysis. Kaiser–Meyer–Olkin Measure of Sampling Adequacy (0.85) was greater than the specified level of 0.6. Bartlett's Test of Sphericity was significant (4762.13 $p < 0.000$). This analysis was forced on a three-factor solution with loadings set at 0.60. The rotated pattern matrix using Promax revealed that 14 items should be deleted due to low factor loadings. The

correlation metrics and content inspection review most of these items as redundant therefore the team agreed and deleted these items.

As a result, the full R-KAS scale was reduced to 38 items. The eigenvalues of the retained factors were 18.1, 4.9, and 3.0, respectively. The underlying dimensions were interpreted by the researchers and labelled (a)

Table 2 Structure Metrix

Item	Description	Factor (Eigenvalues)		
		1 (15.22)	2 (4.24)	3 (2.41)
35	People with mental illness/using substances lack understanding and control over things impacting their mental health	**0.81**[a,b]		
25	Not everyone is capable of actively participating in the recovery process	**0.80** [a,b]		
37	It is harmful to allow people with mental illness or using substances to make decisions about their recovery	**0.78** [a,b]		
30	Professionals should not believe feedback from people who are actively psychotic/using substances	**0.78** [a,b]		
23	Restrictive measures are always needed to manage high risk individuals during the recovery process	**0.77** [a,b]		
32	A therapeutic relationship cannot be established with people who are actively psychotic or using substances	**0.76** [a,b]		
38	There is little that professionals can do to help a person recover if he/she is not ready to accept his/her illness/condition or need for treatment	**0.74** [a,b]		
33	People with mental illness/substance use are violent, aggressive, and commit more crimes than the general population	**0.73** [a,b]		
36	People with mental illness/substance use should not be burdened with the responsibilities of everyday life	**0.73** [a,b]		
10	Professionals should be afraid of people who are actively psychotic	**0.71** [a,b]		
4	It is often unrealistic to have too high an expectation of clients	0.69		
19	People with mental illness/substance use are weak and cannot conform to recovery plans	0.64[b]		
9	Individuals who access recovery-oriented services are attention seekers	0.61[b]		
14	Recovery is not as relevant for those who are actively psychotic or abusing substances	0.61[b]		
15	Recovery is empowering individuals to make decisions about issues that impact their mental health		**0.81**[a]	
5	Recovery gives the individual autonomy and respects the capacity for mistakes to occur		**0.80**[a]	
	Recovery is about offering person-centered support and fostering hope		**0.79**[a]	
18	Recovery is helping individuals explore a meaningful life		**0.79**[a]	
6	Recovery goals need to be built around individual specific needs		**0.77**[a]	
20	Recovery is having a fulfilling life and being able to make choices to enhance individual ability		**0.73**[a]	
21	It is important for the consumer to develop social connections during the recovery process		**0.71**[a]	
22	Being open to opportunities is important to the recovery process		0.68	
2	Recovery is helping individuals in a way they want to be supported		0.67	
24	Adopting healthy lifestyle practices is essential to the recovery process		0.64	
3	The concept of recovery is equally relevant to all phases of treatment		0.63	
26	Recovery is adapting to life circumstances and doing the best you can		0.63	
27	Professionals have a role to assist individuals to live their life in the best way they can		0.62	
28	The recovery process could be affected by other forms of disability (e,g intellectual disability)		0.61	
1	Recovering from mental illness is possible no matter what the cause		0.60	
11	Recovery can impact every area of the person's life			**0.78**[a]
31	Individual's capacity to fulfil their needs may change over time in the recovery process			**0.73**[a]
12	The concept of Recovery is a collaborative process involving all stakeholders			**0.72**[a]
8	Achieving goals may take longer, but small daily progress contributes to recovery			**0.70**[a]
34	Professionals should be aware of individuals'interests and want to provide a holistic service			0.68
29	Therapeutic relationships promote participation in the recovery process			0.67
7	Individuals'personal strengths should be prioritized in the recovery process			0.64
16	Professionals have a role to maintain all the professional codes of conduct and ethical practice			0.61
12	Individual timeframes for recovery vary from person to person			0.60

[a] items included in the shorter version; when a 70-cut-off point was applied

[b] negative worded items

Competence, (b) *Roles and Responsibilities,* and (c) P*rocess* (Table 2).

The first factor, *Competence*, includes 14 items assessing professionals' knowledge and attitude towards the competence of consumers during the recovery process (e.g., individuals who access recovery-oriented services are attention seekers; a reverse worded item). This component explained 34% of the total variance. The second factor, *Roles and Responsibilities*, comprised 15 items assessing professionals' general knowledge and attitude about roles and responsibilities of the staff and people in recovery during the recovery process (e.g., recovery gives the individual autonomy and respects the capacity for mistakes to occur). This component explained 9% of the total variance. The last factor, labelled *Process*, assess professionals understanding of the non-linear nature of recovery, and ethical issues related to recovery practice (9 items) (e.g. Individual's capacity to fulfil their needs may change over time in the recovery process). This component accounted for 5% of the total variance. NB: the eigenvalues and variance explained by the short version and the long version are the same.

Development of the shorter version

The second aim of this study was to develop a brief version of the scale. To achieve this, an additional threshold of 0.70 was applied in the factor analysis, which yielded 21 items in the 3-factor solution. Factor 1 (*Competence*) included 10 items, factor 2 (*Roles and Responsibilities*) consisted of 7 items, and factor 3 (*Process*) included 4 items (Table 2).

Reliability

The study used the split-sample approach to determine the extent of the data collected to measure recovery. The split-sample approach entailed dividing the dataset into two groups for different analysis phases. Specifically, the 173 responses were separated into two independent groups: 150 responses were used for the primary analysis (including exploratory factor analysis (EFA) and reliability analyses), while the remaining 23 responses were reserved for validating the reliability results. To make the reliability comparable to other recovery measures, the researchers used Cronbach's alpha to calculate the reliability coefficient for both the 150 responses and validation of the second 23 datasets. This was to check whether the internal consistency of the total scales and the sub-scales held across different subsets of the data. The Cronbach's alpha values were similar in both groups, suggesting that the items were consistently measured the same construct across different sets of responses.

As illustrated in Table 4, the reliability for 150 participants with the full 38-item version of the scale demonstrated excellent reliability for the total score ($\alpha = 0.95$), and the three subscales of *Competence* (14 items; $\alpha = 93$), *Roles and Responsibilities* (15 items; $\alpha = 92$), and *Process* (8 items; $\alpha = 0.89$). For the second set of participants ($N = 23$), the full 38-item version of the scale had excellent internal consistency for the total score ($\alpha = 0.92$), and the three subscales of *Competence* (14 items; $\alpha = 0.90$), *Roles and Responsibilities* (15 items; $\alpha = 0.87$), and *Process* (8 items; $\alpha = 0.93$).

Similarly, the reliability testing of the shorter version of the scale (21 items) with the 150 participants had excellent internal consistency for the total score ($\alpha = 0.93$) and the three subscales of Competence (10 items; $\alpha = 0.93$), *Roles and Responsibilities* (7 items; $\alpha = 0.92$), and *Process* (4 items; $\alpha = 0.85$). The reliability of the short version of the scale (21 items) with the 23 participants demonstrated excellent internal consistency for the total score ($\alpha = 0.90$), and the three subscales of *Competence* (10 items; $\alpha = 0.92$), *Roles and Responsibilities* (7 items; $\alpha = 0.84$), and *Process* (4 items; $\alpha = 0.93$).

Descriptive analysis further revealed that professionals and students generally had high mean scores for all the three subscales (for the longer version): *Competence* ($M = 4.38$; $SD = 0.68$), *Roles and Responsibilities* ($M = 4.49$; $SD = 0.43$), *Process* ($M = 4.55$; $SD = 0.49$). And the total scale *(R-KAS)* ($M = 4.46$; $SD = 0.45$) Table 3.

Validation

Mann–Whitney U Test

As shown in Table 4, there was a significant difference between the knowledge and attitude of those who have received training in recovery and those who have not received training in recovery for both versions of factor 1 and the total scale, the long version for factor 2 and the short version for factor 3. However, for factor 2 of the short version and Factor 3 of the long version, there were no significant differences.

Spearman correlation between R-KAS and professionals' years of experience

As illustrated in Table 5, the correlations between professionals' years of experience and their recovery knowledge and attitudes were not significant, except for the longer version of factor 1. However, this association of $r = -0.196$ did not explain much variance.

Recovery Knowledge and Attitude Scale (R-KAS)

Based on the results of the factor analysis, reliability analyses, and validity analyses, the short 21-item version of the Recovery Knowledge and Attitude Scale (R-KAS) is recommended over the longer 38-item version. The internal consistency of the short and longer versions of the scale, as well as the validity evidence for the two versions,

Table 3 Scale, sub-scale and item characteristics and reliability

Code	Factor/Sub-domain	Composite Mean (SD)	Reliability (alpha)	Reliability if item deleted
Factor 1 (Recovery Competence)				
35	People with mental illness/using substances lack understanding and control over things impacting their mental health	4.20(1.06)		0.92
25	Not everyone is capable of actively participating in the recovery process	3.84(1.31)		0.93
37	It is harmful to allow people with mental illness or using substances to make decisions about their recovery	4.50(.77)		0.93
30	Professionals should not believe feedback from people who are actively psychotic/using substances	4.54(.74)		0.93
23	Restrictive measures are always needed to manage high risk individuals during the recovery process	4.36(.98)		0.93
32	A therapeutic relationship cannot be established with people who are actively psychotic or using substances	4.49(.84)		0.93
38	There is little that professionals can do to help a person recover if he/she is not ready to accept his/her illness/condition or need for treatment	3.91(1.26)		0.93
33	People with mental illness/substance use are violent, aggressive, and commit more crimes than the general population	4.51(.79)		0.93
36	People with mental illness/substance use should not be burdened with the responsibilities of everyday life	4.46(.84)		0.93
10	Professionals should be afraid of people who are actively psychotic	4.58(.73)		0.93
4	It is often unrealistic to have too high an expectation of clients	3.86(1.28)		0.93
19	People with mental illness/substance use are weak and cannot conform to recovery plans	4.63(.76)		0.93
9	Individuals who access recovery-oriented services are attention seekers	4.76(.58)		0.93
14	Recovery is not as relevant for those who are actively psychotic or abusing substances	4.66(0.70)		0.93
	Total mean and Reliability: Factor 1	4.38(.68)	0.93	
Factor 2 (Roles, and Responsibilities)				
15	Recovery is empowering individuals to make decisions about issues that impact their mental health	4.60(0.55)		0.91
5	Recovery gives the individual autonomy and respects the capacity for mistakes to occur	4.58(0.50)		0.91
17	Recovery is about offering person-centered support and fostering hope	4.58(0.54)		0.91
18	Recovery is helping individuals explore a meaningful life	4.57(0.59)		0.91
6	Recovery goals need to be built around individual specific needs	4.63(0.51)		0.92
20	Recovery is having a fulfilling life and being able to make choices to enhance individual ability	4.59(0.54)		0.92
21	It is important for the consumer to develop social connections during the recovery process	4.45(0.58)		0.92
22	Being open to opportunities is important to the recovery process	4.43(0.63)		0.92
2	Recovery is helping individuals in a way they want to be supported	4.55(0.61)		0.92
24	Adopting healthy lifestyle practices is essential to the recovery process	4.39(0.61)		0.92
3	The concept of recovery is equally relevant to all phases of treatment	4.35(0.83)		0.92
26	Recovery is adapting to life circumstances and doing the best you can	4.57(0.69)		0.92

Table 3 (continued)

Code	Factor/Sub-domain	Composite Mean (SD)	Reliability (alpha)	Reliability if item deleted
27	Professionals have a role to assist individuals to live their life in the best way they can	4.57(.058)		0.92
28	The recovery process could be affected by other forms of disability (e,g intellectual disability)	4.39(0.66)		0.92
1	Recovering from mental illness is possible no matter what the cause	4.09(0.95)		0.93
	Total mean and Reliability: Factor 2	4.49(0.43)	0.92	
Factor 3(Non-linearity and Ethical issues)				
	Recovery can impact every area of the person's life	4.62(0.57)		
31	Individual's capacity to fulfil their needs may change over time in the recovery process	4.60(.058)		0.88
13	Recovery is a collaborative process involving all stakeholders	4.48(0.66)		0.88
8	Achieving goals may take longer, but small daily progress contributes to recovery	4.46(0.76)		0.88
34	Professionals should be aware of individuals'interests and want to provide a holistic service	4.54(0.63)		0.87
29	Therapeutic relationships promote participation in the recovery process	4.56(0.55)		0.88
7	Individuals'personal strengths should be prioritized in the recovery process	4.43(0.76)		0.89
16	Professionals have a role to maintain all the professional codes of conduct and ethical practice	4.77(0.44)		0.89
12	Individual timeframes for recovery vary from person to person	4.49(0.83)		0.88
	Total mean and Reliability: Factor 3	4.55(0.49)	0.89	
	Overall mean for the 38 items	4.46 (0.45)		
	Overall Alpha for the 38 items		0.95	

Table 4 Mann U Mann–Whitney Test (Received Training in Recovery VS Received No Training in Recovery)

Description	N	Mean Rank		Sum of Ranks		Z-score		P-value		Mann–Whitney U	
		LV	SV	LV	SV	LV	SV	LV	SV	LV	SV
Factor 1											
Yes	97	61.48	60.79	5963.50	5896.50	−4.352	−3.922	.001*	.001*	244.500	311.500
No	15	24.30	28.77	364.50	431.50						
Factor 2											
Yes	97	59.26	58.48	5748.00	5672.50	−2.321	−1.766	.020*	.077	460.000	535.500
No	15	38.67	43.70	580.00	655.50						
Factor 3											
Yes	97	58.32	59.22	5657.50	5744.50	−1.590	−2.473	.112	.013*	550.500	463.500
No	15	44.70	38.90	670.50	583.50						
Total Scale											
Yes	97	60.55	60.53	5873.00	5871.50	−3.367	−3.427	.001*	.001*	335.000	336.500
No	15	30.33	30.43	455.00	456.50						

* $p < .05$; Factor 1 = Competence, Factor 2 = Roles and Responsibilities, Factor 3 = Process; *LV* longer version, *SV* shorter version

is comparable. Short assessment instruments have utility in that they save respondents' time, and respondents are more likely to complete the assessment.

The scale is provided in Table 6.

Discussion

This study aimed to undertake a review and revision of the RKI and develop a psychometrically sound adaptation of the scale. The new items aimed to assess knowledge

Table 5 Spearman Correlation between R-KAS, R-KAS subscales and professionals' Years of Experience

Years worked in mental health	Correlation Coefficient	Years worked in mental health	Factor1 LV	Factor2 LV	Factor3 LV	Total Scale LV	Factor1 SV	Factor2 SV	Factor3 SV	Total Scale SV
	1.000	-.196*	-.076	.002	-.090	-.189	-.068	-.037	-.133	
	Sig. (2-tailed)		.049	.451	.987	.370	.059	.501	.713	.186
	N	101	101	101	101	101	101	101	101	101

LV longer version, *SV* shorter version

Table 6 Recovery Knowledge and Attitude Scale (R-KAS) (Short version)

Respondent ID…… Date……..

This scale aims to understand your knowledge and attitude regarding recovery. There are no wrong or right answers. Please read each statement carefully, and with your understanding indicate how much you agree or disagree with each item by filling in the appropriate box

Please rate the following items on a scale of SD to SA:

Strongly Disagree Disagree Not Sure Agree Strongly Agree

		SD	D	NS	A	SA
1.	Recovery gives the individual autonomy and respects the capacity for mistakes to occur.					
2.	Recovery goals need to be built around individual specific needs.					
3.	Achieving goals may take longer, but small daily progress contributes to recovery.					
4.	Recovery can impact every area of the person's life.					
5.	The concept of Recovery is a collaborative process involving all stakeholders.					
6.	Recovery is empowering individuals to make decisions about issues that impact their mental health.					
7.	Recovery is helping individuals explore a meaningful life.					
8.	Recovery is having a fulfilling life and being able to make choices to enhance individual ability.					
9.	Recovery is about offering person-centered support and fostering hope.					
10.	It is important for the consumer to develop social connections during the recovery process.					
11.	Restrictive measures are always needed to manage high risk individuals during the recovery process.					
12.	Not everyone is capable of actively participating in the recovery process.					
13.	Professionals should not believe feedback from people who are actively psychotic/using substances.					
14.	Individual's capacity to fulfil their needs may change over time in the recovery process.					
15.	A therapeutic relationship cannot be established with people who are actively psychotic or using substances.					
16.	People with mental illness/substance use are violent, aggressive, and commit more crimes than the general population.					
17.	People with mental illness/using substances lack understanding and control over things impacting their mental health.					
18.	People with mental illness/substance use should not be burdened with the responsibilities of everyday life.					
19.	It is harmful to allow people with mental illness or using substances to make decisions about their recovery.					
20.	Professionals should be afraid of people who are actively psychotic					
21.	There is little that professionals can do to help a person recover if he/she is not ready to accept his/her illness/condition or need for treatment.					

The R-KAS was developed with several stakeholders by researchers at the School of Health, Faculty of Medicine and Health, University of New England, Australia

and attitudes toward mental health recovery. The items comprising the scale were based on previous literature, the previously developed RKI measure, and input from mental health consumers, and professionals. The psychometric properties of the R-KAS focused on the validity and reliability of the items.

Adaptation and validation of R-KAS

Knowledge and attitudes of professionals toward recovery from mental illness are important elements in improving services [51]. Professional knowledge and attitudes can be foundational in providing a consumer-centered service [39]. The findings from this study indicating strong agreement among professionals and students on the various dimensions of knowledge and attitudes demonstrates that they are increasingly aware of the recovery concept. These findings are consistent with previous literature [39], which suggests that professionals and students understand recovery as a personal process [19].

The validity of an instrument describes the extent to which the items measure what it is intended to measure. The valid scale/item exhibits good psychometric properties and measures what it is intended to measure. Researchers have concluded that the individual scores of a valid instrument are meaningful and allow the researcher to draw good conclusions from the sample population being studied [52]. Validity has historically been measured using criterion-based, content, and construct validity [53, 54]. The criterion-based validity is based on the correlation of items with an accepted standard, while the construct validity focuses on the conceptual variable underlying a test. Finally, content validity is based on the subject matter of a test. The concept explains the extent to which the test items, tasks, and questions assess the trait that the test is designed to measure [54]. This includes the representativeness of the definition of the construct, linguistic aspects of items, representativeness of the item pool, and the adequacy of the response format [55].

In this study, the content-based validity approach was used to test the validity of the RKAS instrument. In doing this, a co-design approach was used to engage Mental health experts and other stakeholders to give their inputs in the design and validation of the R-KAS. Specifically, Stakeholders, including consumers, with expert knowledge of recovery, contributed to the development and selection of items. Stakeholders independently review the items and provide feedback on the items and again reconvene to review and reconcile the independent comments and feedback from the initial review. This process ensured face validity of the items and its implication on the lives of consumers. The content validity confirms the validation of some recovery instruments in Australia and international settings. For example, prior systematic review confirmed that out of 15 included instruments, only 9 met the standard content validity criteria of actively involving consumers and experts in developing the instrument [18]. In previous instruments, measures were rated strongly for content validity if consumers were involved in the selection and adaptation of items. Instruments that have high content validity comparable to the RKAS are the Recovery Attitudes Questionnaire (RAQ), the Provider Expectations for Recovery Scale, Illness Management and Recovery (IMR) Scales, Milestones of Recovery Scale (MORS), and Consumer Recovery Outcomes System (CROS) [18].

The initial results of this newly adapted scale suggest that it may overcome the limitations of previous measures as it was collaboratively developed by professionals, consumers, and caregivers. This measure includes additional relevant components of recovery, such as the therapeutic relationship. While further validation is needed to support these initial results, it appears that the R-KAS may be a relevant tool to capture data on knowledge and attitudes and inform evidence-based practice.

Evidence of known-groups validity was provided through comparisons between participants who had received training in mental health recovery and those who had not, as well as by examining the association between years of mental health practice experience and scale scores. Consistent with previous findings [18, 39, 56], participants who had received recovery training had significantly higher mean scores. These differences were significant for Factor 1 (long and short versions), total scale (long and short versions), Factor 2 (long version), and Factor 3 (short version) of the scale and the subscales. Contrary to expectations, there was no significant relationship between years of experience and the R-KAS total score, or subscales. However, this is somewhat consistent with a previous finding indicating that some professionals with many years of experience had a limited understanding of the concept of recovery. This was also revealed in qualitative interviews of recovery-oriented practice [19]. This may be related to the shift from the previous bio-medical framework to the more recent recovery-orientation approach [1, 57].

Internal consistency of the R-KAS

Reliability is the degree to which test scores are free from measurement error. It is an important element in measuring the psychometric properties of the item. Research suggest that psychometric tests can be reliable if the results are consistent across time (test–retest reliability), across items (internal reliability), and across raters (inter-rater reliability) [54, 58, 59]. These tests are performed using Cronbach's alpha, Spearman correlations

coefficient MS, LCRC, lambda-2, and McDonald's Omega. In this study, the internal reliability measured by Cronbach's alpha was used to assess the reliability of the RKAS items. A reliability coefficient greater than 0.7 was considered relatively reliable as reported in previous literature [54]. A split-sample approach which involves dividing the dataset into two groups for different analysis phases. For example, the 173 responses in this study were separated into two independent groups: 150 responses were used for the primary analysis, while the remaining 23 responses were reserved for validating the reliability results. The findings confirmed that long, and the short versions of R-KAS had higher internal consistency ($\alpha = 0.95$ for long version; $\alpha = 0.93$ for short version) across the samples, demonstrating that they are reliable to measure the knowledge and attitudes of mental health professionals and students towards recovery.

The reliability co-efficient outperform past psychometric testing of the RKI scale [17, 34–36]. Specifically, the three domains of the R-KAS scale (Competence $\alpha = 0.93$, Roles and Responsibilities $\alpha = 0.92$, and Process $\alpha = 0.89$) were the reliability co-efficient of the current sample. The findings confirms the previous RKI scale, where two domains (roles and responsibilities, non-linearity) had good internal consistency ($\alpha = 0.70$ to $\alpha = 0.80$), and two other domains had poor reliability coefficients ($\alpha = 0.47$ to $\alpha = 0.63$) [56]. Previous reliability estimates for the RKI in an Australian sample, found three domains to have good reliability ($\alpha = 0.72$, 0.75, and 0.80), whilst one domain had poor reliability ($\alpha = 0.49$) [21]. The initial reliability results of the R-KAS tool found here are also stronger than previous reliability estimates of the RKI in non-English versions, including the Japanese (0.24 to 0.75) [20] and Swedish ($\alpha = 0.13$ to 0.70) translations [19]. These preliminary results suggest that the new R-KAS scale may be useful in assessing mental health professionals'and students' knowledge and attitudes toward recovery.

Implications for policy and mental health practice

This measure, the R-KAS, may be useful for the evaluation of strengths and areas for improvement in service evaluation, supervision, and for practitioner self-reflection. While further research is required to ascertain normative data, professionals, and trainees in this study generally had strong knowledge and positive attitudes toward the aspects of recovery. The knowledge and attitudes were generally based on their positive response in each of the construct. Based on this, service providers are encouraged to consistently strengthen the approaches used to train professionals and students on the recovery-oriented framework. For example, current modules on recovery concepts as part of the mental health curriculum should continually be reviewed and updated. Similarly, training that incorporates the recovery conceptualisation should be promoted within in-service training and professional development for professionals. Clinicians and service planners are encouraged to implement and continually review the application of recovery principles in their practice. The R-KAS tool may prove to be a useful tool in the evaluation of the educational outcomes of these processes, as well as service evaluation.

To reduce the time and cost associated with using longer surveys and based on the initial psychometric properties (strong factor loadings) of the R-KAS reported here, stakeholders are encouraged to utilise the short version of the instrument in most situations, rather than the full version. The data could be used to inform self-reflection, training, clinical decisions, and practice.

Limitations and directions for future research

While the present study offers a promising adaptation and initial validation of the Recovery Knowledge and Attitudes Scale (R-KAS), several limitations must be acknowledged in line with best practices for psychometric research, including the COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) guidelines.

First, although exploratory factor analysis (EFA) revealed a stable three-factor structure with high factor loadings and excellent internal consistency, the absence of Confirmatory Factor Analysis (CFA) limits the ability to fully validate the proposed structure. Future research should conduct CFA in larger and more diverse samples to test the robustness and replicability of the factor structure.

Second, the sample size, while acceptable for exploratory purposes, was relatively small ($N = 173$) given the number of items initially analyzed. Although high factor loadings support the stability of the factor structure, the loss of approximately 60 incomplete responses may have impacted the reliability of the EFA. Furthermore, the student subgroup was relatively small and may not have meaningfully contributed to the factor structure. Future studies should consider stratifying analyses by group or using larger, more balanced samples across student and professional groups.

Third, additional validity evidence is needed. Convergent, divergent, and criterion-related validity analyses were not conducted in the current study. Incorporating these analyses in future research would provide a more comprehensive understanding of the scale's construct validity. The use of parallel analysis and other data-driven methods to determine the number of factors would also strengthen future factor analytic work.

Fourth, as the current findings offer only cross-sectional insights, longitudinal research is recommended to assess how recovery knowledge and attitudes evolve over time and in response to targeted training or policy changes. This approach would provide stronger evidence for the scale's sensitivity to change.

Lastly, Sample representativeness was limited, as key stakeholders—such as occupational therapists, peer support/lived experience workers, general practitioners, and family caregivers—were not involved in the tool's development or testing. To enhance the scale's applicability and relevance in real-world, multidisciplinary settings, future research should involve a broader range of mental health professionals and service users throughout both item development and validation processes. Given the critical roles that family caregivers, community members, and service users play in mental health recovery, it is also essential to explore recovery-related knowledge and attitudes across all stakeholder groups. Employing participatory and co-production methodologies is strongly encouraged to ensure a more holistic, inclusive understanding of recovery-oriented practices.

Conclusion

This study has described the development and initial validation of the Recovery Knowledge and Attitudes Scale (R-KAS), a tool designed to assess understanding and attitudes toward mental health recovery among professionals and students. Grounded in existing literature and informed by input from consumers and caregivers, the R-KAS reflects a more inclusive and contemporary understanding of recovery principles.

The tool offers both a long and a short version, allowing for flexible use depending on the context. These versions may help users self-assess their knowledge of recovery-oriented practices, highlight areas for further development, and ultimately support the delivery of person-centered care. While additional psychometric testing—such as confirmatory factor analysis and validity testing—is needed, early findings suggest the R-KAS is a promising measure with strong internal reliability and practical relevance.

Importantly, the R-KAS may assist in moving away from a predominantly biomedical focus on symptom reduction, toward a more holistic view of recovery as a personal and relational process. By offering a structured way to measure recovery knowledge and attitudes, the tool may contribute to the intentional promotion of recovery-oriented values in mental health education and practice.

Although this paper recommends the short version of the scale for routine use, the long version may provide added value, as it captures broader dimensions, including quality of life. Future research and application across diverse settings and populations will further clarify the utility and impact of both versions of the R-KAS in enhancing recovery-oriented care.

Abbreviations

R-KAS	Recovery Knowledge and Attitude Scale
RKI	Recovery Knowledge Inventory
HREC	Human Reearch Ethics Committee
SPSS	Statistical Package for Social Sciences
KMO	Kaiser–Meyer–Olkin
BTS	Bartlett's test of sphericity
EFA	Exploratory Factor Analysis
LV	Long Version; Short Version

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Authors' contributions

N.B., K.U., and S.I conceptualized the study. N.B performed the field data collection. N.B, N.S., and K.R performed the data analysis. N.B drafted the manuscript. All the authors reviewed the manuscript and made inputs into the content. The authors agreed on the manuscript submission for publication.

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Data availability

Derived data supporting the findings of this study are available from the corresponding author on request. Once this is published, the usage of the scale is dependent upon being provided with the raw data so that researchers can use that eventually to perform further analyses of the scale.

Declarations

Ethics approval and consent to participate

The study was approved by the Human Research Ethics Committee (HREC) at the University of New England. Informed consent was obtained from participants involved in the study. All the methods performed in the study involving human participants were in accordance with the ethical standards of the institutional and the national research committee.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

[1] School of Health, University of New England, Armidale, NSW, Australia.
[2]School of Psychology, University of New England, Armidale, NSW, Australia.
[3]School of Counseling, Excelsia University College, Sydney, NSW, Australia.

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References

1. Allott P, Loganathan L, Fulford K. Discovering hope for recovery from a British perspective: A review of literature. Can J Commun Ment Health. 2002;21(2):13–33.
2. Deegan PE. Recovery: The lived experience of rehabilitation. Psychosocial rehabilitation journal. 1988;11(4):11.
3. Fisher DB. Health care reform based on an empowerment model of recovery by people with psychiatric disabilities. Psychiatr Serv. 1994;45(9):913–5.

4. Cale EL, et al. Psychometric properties of the Recovery Assessment Scale in a sample with substance use disorder. Addiction Research & Theory. 2015;23(1):71–80.
5. Fisher DG, et al. Psychometric properties of an assessment for mental health recovery programs. Community Ment Health J. 2009;45:246–50.
6. Armstrong NP, et al. Validating a brief version of the mental health recovery measure for individuals with schizophrenia. Psychiatr Serv. 2014;65(9):1154–9.
7. Ramon S, Healy B, Renouf N. Recovery from mental illness as an emergent concept and practice in Australia and the UK. Int J Soc Psychiatry. 2007;53(2):108–22.
8. Wilrycx G, et al. Mental health recovery: Evaluation of a recovery-oriented training program. Scientific World Journal. 2012;2012(1): 820846.
9. Australian Institute of Health and Welfare. Measuring recovery in Australian specialised mental health services: A status report. 2025. https://www.aihw.gov.au/getmedia/4c6c763c-9.
10. Anthony WA. Recovery from mental illness: the guiding vision of the mental health service system in the 1990s. Psychosocial rehabilitation journal. 1993;16(4):11.
11. Gyamfi N, Bhullar N, Islam MS, Usher K. Models and frameworks of mental health recovery: A scoping review of the available literature. J Mental Health. 2022;31(1);1–13.
12. Argentzell E, et al. Measuring personal recovery–psychometric properties of the Swedish questionnaire about the process of recovery (QPR-Swe). Nord J Psychiatry. 2017;71(7):529–35.
13. Beckers, T., et al., Measuring personal recovery in a low-intensity community mental healthcare setting: validation of the Dutch version of the individual recovery outcomes counter (I. ROC). BMC psychiatry. 2022. 22(1): p. 38.
14. Kraiss JT, et al. Measuring personal recovery in people with bipolar disorder and exploring its relationship with well-being and social role participation. Clin Psychol Psychother. 2019;26(5):540–9.
15. Cleary A, Dowling M. Knowledge and attitudes of mental health professionals in Ireland to the concept of recovery in mental health: a questionnaire survey. J Psychiatr Ment Health Nurs. 2009;16(6):539–45.
16. Salyers MP, Brennan M, Kean J. Provider Expectations for Recovery Scale: refining a measure of provider attitudes. Psychiatr Rehabil J. 2013;36(3):153.
17. Bedregal LE, O'Connell M, Davidson L. The Recovery Knowledge Inventory: assessment of mental health staff knowledge and attitudes about recovery. Psychiatr Rehabil J. 2006;30(2):96.
18. Gyamfi N, et al. A systematic review of measures assessing mental health professionals' perspectives of recovery. Int J Ment Health Nurs. 2021;30(4):847–74.
19. Wilrycx G, et al. Psychometric properties of three instruments to measure recovery. Scand J Caring Sci. 2012;26(3):607–14.
20. Chiba R, et al. The property of the Japanese version of the Recovery Knowledge Inventory (RKI) among mental health service providers: a cross sectional study. Int J Ment Heal Syst. 2017;11:1–10.
21. Happell, B., M. Byrne, PhD, Louise, and B. Platania-Phung, PhD, Chris, The recovery knowledge inventory for measurement of nursing student views on recovery-oriented mental health services. Issues in mental health nursing, 2015. 36(10): p. 799–808.
22. Ofina MS. Attitudes toward and knowledge of recovery-oriented care among community mental health providers: An exploratory and confirmatory factor analysis of the Recovery Knowledge Inventory (RKI) [Doctoral dissertation, Alliant International University]. ProQuest Dissertations & Theses Global. 2016. https://www.proquest.com/dissertations-theses/attitudes-toward-knowledge-recovery-oriented/docview/1900000000/se-2.
23. Chamberlin J. User/consumer involvement in mental health service delivery. Epidemiology and Psychiatric Sciences. 2005;14(1):10–4.
24. Storm M, Edwards A. Models of user involvement in the mental health context: intentions and implementation challenges. Psychiatr Q. 2013;84:313–27.
25. Cheung GW, et al. Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. Asia Pacific Journal of Management. 2024;41(2):745–83.
26. Borg M, Kristiansen K. Recovery-oriented professionals: Helping relationships in mental health services. J Ment Health. 2004;13(5):493–505.
27. Clarke C, et al. What does recovery mean to a forensic mental health patient? A systematic review and narrative synthesis of the qualitative literature. J Forensic Psychiatry Psychol. 2016;27(1):38–54.
28. Howgego IM, et al. The therapeutic alliance: The key to effective patient outcome? A descriptive review of the evidence in community mental health case management. Aust N Z J Psychiatry. 2003;37(2):169–83.
29. Salgado JD, et al. Hope and improvements in mental health service providers' recovery attitudes following training. J Ment Health. 2010;19(3):243–8.
30. Schrank B, Stanghellini G, Slade M. Hope in psychiatry: a review of the literature. Acta Psychiatr Scand. 2008;118(6):421–33.
31. Hungerford C, Dowling M, Doyle K. Recovery outcome measures: is there a place for culture, attitudes, and faith? Perspect Psychiatr Care. 2015;51(3):171–9.
32. Klockmo C, et al. Knowledge and attitude regarding recovery among mental health practitioners in Sweden. Int J Rehabil Res. 2012;35(1):62–8.
33. Marshall S, et al. Carers' hope, wellbeing and attitudes regarding recovery. Community Ment Health J. 2013;49:344–53.
34. Meehan T, Glover H. Using the recovery knowledge inventory (RKI) to assess the effectiveness of a consumer-led recovery training program for service providers. Psychiatr Rehabil J. 2009;32(3):223.
35. Mugnier KP. Recovery knowledge and recovery-oriented clinical decision-making among mental health professionals working with clients with serious mental illnesses [Doctoral dissertation, Philadelphia College of Osteopathic Medicine]. PCOM Psychology Dissertations. 2017. https://digitalcommons.pcom.edu/psychology_dissertations/411/.
36. Neathery M. Spiritual perspectives, spiritual care, and recovery-oriented practice in psychiatric mental health nurses [Doctoral dissertation, University of Texas at Tyler]. UT Tyler ScholarWorks. 2018. https://hdl.handle.net/10950/846.
37. Peebles SA, et al. Immersing practitioners in the recovery model: an educational program evaluation. Community Ment Health J. 2009;45:239–45.
38. Repique RJR, et al. Implementation of a recovery-oriented training program for psychiatric nurses in the inpatient setting: A mixed-methods hospital quality improvement study. Arch Psychiatr Nurs. 2016;30(6):722–8.
39. Gyamfi N, et al. Knowledge and attitudes of mental health professionals and students regarding recovery: A systematic review. Int J Ment Health Nurs. 2020;29(3):322–47.
40. de Winter*, J.C., D. Dodou*, and P.A. Wieringa, Exploratory factor analysis with small sample sizes. Multivariate behavioral research, 2009. 44(2): p. 147–181.
41. Jung S, Lee S. Exploratory factor analysis for small samples. Behav Res Methods. 2011;43:701–9.
42. Sakaluk JK, Short SD. A methodological review of exploratory factor analysis in sexuality research: Used practices, best practices, and data analysis resources. The Journal of Sex Research. 2017;54(1):1–9.
43. Tabachnick BG. Fidell, Linda S. Using Multivariate Statistics Boston: Pearson Education. 2013;7:225–48.
44. Berg N. Non-response bias. In K. Kempf-Leonard (Ed.), Encyclopedia of social measurement. Vol. 2. Academic Press; 2005. pp. 865–73. https://doi.org/10.1016/B978-012369398-3.00152-0.
45. Bańbura M, Modugno M. Maximum likelihood estimation of factor models on datasets with arbitrary pattern of missing data. J Appl Economet. 2014;29(1):133–60.
46. Udovičić M, et al. What we need to know when calculating the coefficient of correlation? Biochemia Medica. 2007;17(1):10–5.
47. McKnight PE, Najab J. Mann-Whitney U test. In I. B. Weiner & W. E. Craighead (Eds.), The Corsini encyclopedia of psychology, 4th ed, Vol. 1. Wiley; 2010. p. 1. https://doi.org/10.1002/9780470479216.corpsy0524.
48. MacFarland TW, Yates JM. Introduction to nonparametric statistics for the biological sciences using R. Springer; 2016. https://doi.org/10.1007/978-3-319-30634-6.
49. Gaffey K, Evans D, Walsh F. Knowledge and attitudes of Irish Mental Health Professionals to the concept of recovery from mental illness–five years later. J Psychiatr Ment Health Nurs. 2016;23(6–7):387–98.
50. Hayes AF, Coutts JJ. Use omega rather than Cronbach's alpha for estimating reliability. But…. Communication Methods and Measures. 2020;14(1):1–24. https://doi.org/10.1080/19312458.2020.1719182.

51. Walsh FP, et al. Recovery-based training in mental health: Effects on staff knowledge and attitudes to recovery. Issues Ment Health Nurs. 2017;38(11):886–95.
52. Mohamad MM, et al. Measuring the validity and reliability of research instruments. Procedia Soc Behav Sci. 2015;204:164–71.
53. Badu E, O'Brien AP, Mitchell R. An integrative review on methodological considerations in mental health research–design, sampling, data collection procedure and quality assurance. Archives of Public Health. 2019;77(1):37.
54. White RF, Braun JM, Kopylev L, Segal D, Sibrizzi CA, Lindahl AJ, Hartman PA, Bucher JR. NIEHS report on evaluating features and application of neurodevelopmental tests in epidemiological studies (NIEHS Report No. 01). National Institute Environ Health Sciences. 2022. https://doi.org/10.22427/NIEHS-01.
55. Koller I, Levenson MR, Glück J. What do you think you are measuring? A mixed-methods procedure for assessing the content validity of test items and theory-based scaling. Front Psychol. 2017;8:126.
56. Crowe TP, et al. Effectiveness of a collaborative recovery training program in Australia in promoting positive views about recovery. Psychiatr Serv. 2006;57(10):1497–500.
57. Gudjonsson GH, Webster G, Green T. The recovery approach to care in psychiatric services: Staff attitudes before and after training. Psychiatrist. 2010;34(8):326–9.
58. Gómez-Gastiasoro A, et al. Equivalent short forms of the Situational Feature Recognition Test 2: Psychometric properties and analysis of interform equivalence and test–retest reliability. Int J Methods Psychiatr Res. 2019;28(4): e1802.
59. Siddi S, et al. Measurement invariance of the Spanish Launay-Slade Hallucinations Scale-Extended version between putatively healthy controls and people diagnosed with a mental disorder. Int J Methods Psychiatr Res. 2018;27(4): e1741.

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