Validation of the Routine Assessment of Patient Progress (RAPP) in patients with psychosis in South India

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ABSTRACT *The aim of the study was to validate the Routine Assessment of Patient Progress (RAPP), an instrument for assessment by nurses, among patients with psychosis in South India. One hundred consecutive patients with psychosis admitted to the Department of Psychiatry, Christian Medical College, Vellore, India, were assessed on day five and day 19 using the RAPP, the PANSS, and the CGI scales. The correlation of the RAPP with the other scales, its change over time, the inter-rater reliability, and factor structure were assessed. The subscales of RAPP correlated significantly with those of the other scales at intake and at follow-up. The RAPP scores changed significantly after treatment. Its inter-rater reliability as measured by the intra-class correlation coefficient was 0.98. The Cronbach's alpha, used to measure the internal consistency of the scale, was 0.87. The split-half reliability (Spearman-Brown) was 0.89. Principal component analysis with varimax rotation revealed six factors, which explained 67.4% of the variance. Items related to life skills explained a major proportion of the variance. The good psychometric properties, concurrent validity, high inter-rater reliability and sensitivity to change make it a useful instrument for nurses to employ to assess patients with psychoses.*

Key words: psychoses, schizophrenia, nurses, assessment

Introduction

The quality of a nursing assessment of mental disorders is important in the delivery of holistic nursing care. The majority of instruments used by nurses to assess progress of patients with psychiatric disorders suffer from a variety of problems (Ehmann et al., 1995). The existing scales are briefly described and their disadvantages are highlighted.

The Nurse's Observation Scale for Inpatient Evaluation (NOSIE) (Honigfeld et al., 1966) was developed to be based on behaviour of hospitalized psychiatric patients observed over a three-day period. There are 80 items, which cover a wide range of activities. Each item is rated on a five-point scale. The main disadvantages include a limited sampling of psychotic symptoms. It also includes an organic variable (memory) in a scale that essentially measures social competence. The emotional assessment is restricted to manifestations of irritability and crying.

The scale does not address issues related to the safety of the patient.

The recently developed Manchester Nurse Rating Scale has been evaluated for validity and reliability (Brierley et al., 1988). However, the items included are restricted to assessing affective disorders. In addition, it is intended for daily use and consequently places an increased burden on nursing staff.

The nursing modification of the Brief Psychiatric Rating Scale (McGorry et al., 1988) has also been evaluated in detail. Nurses are able to make reliable assessments of psychopathology. It has also been shown to be effective in measuring changes over time. However, it does not satisfy nursing requirements to develop care plans based on social, behavioural and physical abilities, as well as the symptoms and signs of psychopathology.

Life Skill Profile (Rosen et al., 1989) is another scale for use by nurses in order to assess life skills. Its main

disadvantage is that the scale assesses functioning over the previous six months. It appears that it is best completed by caretakers and case managers who are well acquainted with the patient's functioning in the community over a long period of time.

These scales have failed to gain acceptance by nursing staff because they are perceived as difficult to use or marginally relevant to daily nursing practice.

An acceptable instrument for use by nurses should possess the following characteristics:

- inter-rater reliability;
- internal consistency;
- concurrent validity;
- discriminant validity;
- assessment of severity for each item;
- means of providing qualitative information on issues that are difficult to measure quantitatively;
- a method of setting priorities in order to resolve patient problems;
- provision of interview based data to compliment observations of psychiatrists, psychologists and other mental health professionals and
- ease of use (Ehmann et al., 1995).

The Routine Assessment of Patient Progress (RAPP) is designed for nurses to combine observations with interview-based ratings in order to assess the presence and their severity of multiple domains of patient functioning and to overcome the limitations of the existing scales (Ehmann et al., 1995; Ehmann et al., 2001). The RAPP consists of 21 scoreable items (for example, diet, sleep, elimination, safety, movement, anxiety, mood, activity, delusions, hallucinations, speech, hostility, memory, hygiene, cooperation, socialization, budgeting, sexual expression, leisure, problem solving, nurse's attention) and a seven-part descriptive section (for example, patients strengths, use of as needed medication, use of seclusion/restraint, special nursing concerns, nursing care plan). Anchor points are established for each item to rate severity. The sum of all 21 items forms a total score that reflects a patients overall functioning.

The RAPP has been designed to provide nursing staff with a standardized method of evaluating psychiatric inpatients. Newly admitted patients are typically assessed for at least one week and the information is used to assist in making a diagnosis and to formulate a treatment plan. The RAPP is useful for

both of these purposes in that, it encourages nursing staff to observe and interact with a patient in order to obtain a systematized account of a patient's symptoms and functioning in several broad areas. The scale has also been shown to be sensitive to changes over time and has been shown to be reliable and valid. It takes about 20 minutes to administer.

This study attempted to validate the Routine Assessment of Patient Progress scale and assess its reliability and sensitivity to change among patients with psychosis in South India.

Method

Consecutive patients admitted to the Department of Psychiatry, Christian Medical College, Vellore, were recruited for the study. Patients satisfying the following criteria were included in the study:

- International Classification of Diseases 10 (WHO, 1992) criteria for Psychosis (F20- schizophrenia, F25- schizoaffective disorder, F22- delusional disorder, F30, F31- bipolar disorder- mania, F32.3, 33. 3- depression with psychosis, and F23- acute psychosis). The diagnosis was made by a psychiatrist (TJ).
- Conversant with English or Tamil.
- Aged 18–65.

Patients with the following characteristics were excluded:

- Organic mental disorders.
- Psychosis related to substance use.
- Mental retardation.
- Severe language or hearing impairment.

Informed consent was obtained.

Assessments were done using the following instruments after five days of hospitalization:

- Routine Assessment of Patient Progress scale (RAPP) (administered by HC and SC, who are psychiatric nurses).
- Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987) (administered by TJ, who is a psychiatrist).
- Clinical Global Impression-Severity (CGI-S) Scale (Guy, 1976) (administered by TJ) .
- Socio-demographic characteristics using a specially designed proforma.

The patients received standard treatment. The patients were assessed again, using the RAPP, PANSS, Clinical Global Impression- Improvement (CGI-I) Scale (Guy, 1976) after 19 days of hospitalization. Independent raters did the RAPP (HC) and PANSS (TJ) assessments. The inter-rater reliability for RAPP was also assessed on a sub group of patients (by HC and SC).

Analysis

The Pearson's correlation coefficient was used to assess the correlation between RAPP scores and the scores of the scales used for external validation (PANSS and CGI-S) at both intake and at follow up. The sensitivity to change over time was assessed by using the t-test for paired samples. The intra-class correlation coefficient was used to assess the inter-rater reliability. The Cronbach's alpha was employed to measure the internal consistency of the scale. The split-half reliability was assessed using the Spearman-Brown coefficient. The factor structure of the scale was assessed using principal component analysis with varimax rotation.

Results

One-hundred-and-fifteen consecutive patients admitted to the Department of Psychiatry were recruited for the study and completed the first assessment. One-hundred completed the second assessment after three weeks of hospitalization. The differences between subjects who were followed up for the second assessment and those who were not assessed at the third week were not statistically significant when compared on the following variables: age, gender, education, marital status, socio-economic

indices, diagnosis, duration of illness, RAPP and PANSS scores.

Patient characteristics

The average age of the sample was 32.3 (SD 11.2) years. The majority were male (62.6%), married (58.3%), literate (86.1%), and lived in their own accommodation (80.9%), resided in towns and cities (59.1%), had three square meals per day (94.8%) and did not have financial debt (60.9%). The diagnoses were: schizophrenia (31.3%), schizoaffective disorder (2.6%), delusional disorder (3.5%), mania (32.2%), severe depression with psychotic symptoms (26.1%) and acute psychoses (4.3%). The mean duration of illness was 59.7 (SD 74.5) months.

Correlation with PANSS and CGI-S scores at intake

The mean RAPP total, life skill and psychopathology scores were 16.27 (SD 8.72), 7.10 (SD 3.59) and 7.16 (SD 4.51) respectively. The mean PANSS positive, negative, general psychopathology and total scale scores were 20.25 (SD 6.82), 18.30 (SD 8.56), 39.54 (SD 10.19) and 78.09 (SD 20.08) respectively. The RAPP psychopathology scores were significantly correlated with scores on the PANSS positive scale, general psychopathology scale and the total score (Table I). The RAPP life skills subscale scores were significantly correlated with the PANSS positive and total score. The RAPP subscales also correlated with the CGI-S scores.

Sensitivity to change over time

One-hundred patients were assessed at two points of time using the RAPP and the PANSS. Ninety-two patients whose RAPP scores had reduced over time

Table 1. Correlation between RAPP and PANSS and CGI-S scores at intake

	RAPP – Psychopathology	RAPP – Life skills	RAPP – Total
PANSS – Positive	0.558 ***	0.336 ***	0.436 ***
PANSS – Negative	0.159	0.059	0.082
PANSS – General psychopathology	0.296 ***	0.157	0.244 **
PANSS – Total	0.407 ***	0.219 *	0.307 ***
CGI-S	0.389 ***	0.408 ***	0.423 ***

Pearson's correlation coefficient * $p < 0.02$ ** $p < 0.01$ *** $p < 0.001$

PANSS – Positive and negative syndrome scale

CGI-S – Clinical Global Impression – Severity Scale

RAPP – Routine assessment of patient progress scale

also showed a reduction in PANSS scores. Similarly, all the eight subjects who showed no change in symptoms as measured by RAPP also registered no change as measured by PANSS. The RAPP scores were also significantly correlated with the PANSS subscales at follow up (Table 2). Similarly, change in RAPP scores correlated with change in PANSS (Pearson's correlation coefficient = 0.44; $p < 0.001$). The difference between the initial and final scores on all the RAPP and PANSS scales showed a statistically significant reduction over time (Table 3).

Of the 92 subjects who showed a decline in symptoms between the two time periods as measured by RAPP, 64 (69.6%) subjects also showed an improvement in CGI-I scores. Similarly, of the eight subjects who showed no change in symptoms as measured by RAPP, five (62.5%) also registered no change or improvement as measured

by CGI-I scale. The total RAPP score was also correlated with the CGI-I scores, which was also administered at follow up (Table 2).

Reliability, psychometric properties and factor structure

Two raters simultaneously assessed 30 subjects using RAPP. The intra-class correlation coefficient was 0.98. The Cronbach's alpha was 0.87. The split-half reliability (Spearman-Brown) was 0.89. Six factors were extracted that explained 67.4% of the variance (Table 4). The items related to life skills loaded on the first factor. This factor had eigen values of 6.73 and explained 32% of the variance. The other factors had smaller eigen values and explained a smaller percentage of variance. Positive symptoms, hostility-mood, anxiety and sexual expression loaded on separate factors.

Table 2. Correlation between RAPP and PANSS, and GIC-I scores at follow up

	Psychopathology	RAPP – Life skills	RAPP – Total
PANSS –Positive	0.560 ***	0.384 ***	0.516 ***
PANSS –Negative	0.312 **	0.181	0.255 **
PANSS – General psychopathology	0.445 ***	0.313 **	0.392 ***
PANSS – Total	0.493 ***	0.327 ***	0.431 ***
CGI-I	0.415***	0.327***	0.393***

Pearson's correlation coefficient * $p < 0.02$ ** $p < 0.01$ *** $p < 0.001$

PANSS – Positive and negative syndrome scale

CGI-I – Clinical Global Impression- Improvement Scale

RAPP – Routine assessment of patient progress scale

Table 3. Sensitivity to change over time

Scale score	Initial scores	Final scores	t-value	Statistical significance*
RAPP – life skills	7.11 (s.d. 4.57)	2.09 (s.d. 2.66)	12.12	$p < 0.001$
RAPP –psychopathology	7.14 (s.d. 3.5)	2.22 (s.d. 2.54)	16.43	$p < 0.001$
RAPP – total	16.25 (s.d. 8.51)	4.71 (s.d. 5.30)	15.33	$p < 0.001$
PANSS – positive	20.17 (s.d. 7.04)	12.31 (s.d. 4.12)	13.83	$p < 0.001$
PANSS – negative	18.44 (s.d. 8.79)	14.80 (s.d. 7.33)	6.15	$p < 0.001$
PANSS – general psychopathology	39.83(s.d. 10.66)	29.83 (s.d. 7.61)	11.11	$p < 0.001$
PANSS – total	78.44 (s.d. 20.93)	56.89 (s.d. 16.21)	13.50	$p < 0.001$

*t-test for paired samples

RAPP – Routine assessment of patient progress scale

PANSS – Positive and negative syndrome scale

Table 4. Factor structure of RAPP

RAPP item	Factor I (Life skills)	Factor II (Hostility-affect)	Factor III (Budgeting)	Factor IV (Positive symptoms)	Factor V (Sexual expression)	Factor VI (Anxiety)
Eigen value	6.73	1.87	1.77	1.46	1.23	1.08
Percentage of variation explained	32.0	8.9	8.4	7.0	5.9	5.2
Leisure time	0.90					
Socialization	0.84					
Hygiene	0.75					
Nurse attention	0.75					
Speech	0.70					
Social problem solving	0.68					
Activity	0.65					
Diet	0.59					
Cooperation	0.57					
Memory-cognition	0.51					
Sleep		0.74				
Mood-affect		0.67				
Hostility		0.57				
Safety		0.55				
Budgeting			0.69			
Movement problems			0.67			
Elimination			0.60			
Delusions				0.80		
Hallucinations				0.72		
Sexual expression					0.84	
Anxiety						0.75

Discussion

The RAPP was used to assess inpatients with psychosis. It uses items commonly employed by nurses to monitor patients with psychoses, suggesting content validity. The RAPP scores correlated with PANSS scores and the CGI scores suggesting concurrent validity of the instrument. The instrument was also sensitive to change, suggesting its usefulness in monitoring patient progress over time. While the reduction in RAPP and PANSS scores occurred in the same patients, the reduction in RAPP scores did not show a corresponding improvement on the CGI-I scale in a proportion of patients. The possible explanation for this difference could be the fact that the RAPP and PANSS scales show a wide range scores whereas those on the CGI-I range from 0–6. The RAPP can be used to assess change in functioning over time, to document those who can be discharged to

semi-independent living situations. The inter-rater reliability and split-half reliability and the Cronbach's alpha were high. These findings are similar to other studies carried out using the instrument (Ehmann et al., 1995, 2001). The principal component analysis revealed that the latent variable related to life skills had a high eigen value and explained a significant proportion of the variance. Only three of the factors obtained (hostility, positive symptoms, anxiety) are similar to those documented in other studies (Ehmann et al., 2001). However, the eigen values and variance explained by the factors that are not common to the two studies was small.

One limitation of the RAPP scale is the fact that the title of the instrument does not reflect the fact that it is to be used in patients with psychosis. A modification can be considered to reflect this aspect of the scale.

The instrument was easy to use in the Indian population and did not pose any specific difficulties. It was easy to administer. It has a comprehensive sample of psychotic symptoms and items to assess ward behaviour, safety issues and social competence. The RAPP has the advantage of having a patient interview in addition to nurse observation, which makes it easier to evaluate functioning and cognitive processes. The instrument enables nurses to objectively assess target areas for intervention. The good psychometric properties, concurrent validity, high inter-rater reliability and sensitivity to change make it a useful instrument for nurses to employ to assess patients with psychoses.

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Appendix

Routine Assessment of Patient Progress

Instructions:

Rate each item's severity as an average over the past seven days. Check those examples which helped you make your judgement of severity rating. Use space to describe the behaviour which led to your rating. A description must be given when rating delusions or hallucinations and when a severity rating is not based on the given examples. Further instructions for rating items are discussed in the accompanying Raters Guide to the RAPP.

- Dietary problems (increased or decreased appetite, increased fluid intake, decreased fluid intake, special diet, vomiting, requires assistance, increased or decreased weight, other):

0 Absent	1 Mild	2 Moderate	3 Severe
Describe			
- Sleep problems (nightly use of sedatives, difficulty arising, daytime sleep, nightmares, excessive snoring, initial insomnia, middle insomnia, early awakening, other):

0 Absent	1 Mild	2 Moderate	3 Severe
Describe			
- Elimination problems (constipation, urinary retention, prescribed laxative/ suppository/ enema, painful elimination, urinary or faecal incontinence, needs assistance in toileting, prn laxative/ suppository/ enema, other):

0 Absent	1 Mild	2 Moderate	3 Severe
Describe			

4. Safety problems (self harm, suicidal, history of suicidal attempts, danger to others, impulsive, seizures, decreased consciousness, confused or disoriented, decreased mobility, unsafe smoking, substance abuse, acts on delusions or hallucinations, elopement risk, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
5. Movement problems (clumsy, tremulous, writhing, jerking, stiff, complains of restless legs, gait disturbance, falling, grimacing, swallowing problems, ocular problems, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe

Psychopathology scale

6. Anxiety (physical signs (e.g. tremor, sweating, palpitations), dependent/clinging/advice seeking, subjective complaints (e.g. uptight, afraid, worried), obsession, triggers (describe), other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
7. Mood and Affect (irritable, elevated/euphoric, increased self-esteem/grandiose, labile, perplexed, silly, sad/depressed, guilty, worthless, hopeless, suicidal speech/gestures, bland expression, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
8. Activity level (bizarre actions, increase or decrease in goal-directed activity, agitation, psychomotor retardation, ritualistic or repetitive behaviour, posturing, other):
 0 Normal 1 Mild 2 Moderate 3 Severe
 Describe
9. Delusions (paranoid/persecutory, bizarre, erotic, somatic, grandiose, being controlled, other):
 0 Absent 1 Suspected 2 Present 3 Acts upon delusions
 Describe
10. Hallucinations (auditory, visual, tactile, olfactory, gustatory, command; series hallucinations but: talks to self, appears to be listening to voices):
 0 Absent 1 Suspected 2 Present 3 Acts upon delusions
 Describe
11. Form of speech (increased/decreased volume, increased or decreased rate of speech, mute, slurred, monotone; difficult to interrupt, loose association, incoherent, neologisms, disturbed rhythm, other):
 0 Normal 1 Mild 2 Moderate 3 Severe
 Describe
12. Hostility (appears hostile, critical, suspicious, threats, yelling, swearing, angry; abusive comments, throws things, hits/breaks things, physically violent to others, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
13. Cognitive/intellectual (disoriented, memory problems, poor concentration/attention, distractible, concrete thinking; obvious reading/writing/arithmetic problems, impaired judgement, other):
 0 Normal 1 Mild 2 Moderate 3 Severe Describe

Life skill problems

14. Hygiene and appearance (unkempt, unwashed, needs prompts, needs supervision, bizarre appearance, other):
 0 None 1 Mild 2 Moderate 3 Severe
 Describe
15. Cooperation problems (refuses or tongues medications, resists staff directions, resists ward rules/protocol; refuses to participate in off-ward therapies/activities (e.g. OT, recreation therapy, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe

16. Socialization problems (shy, loner, withdrawn, will not initiate conversations, does not respond, self-centered; poor manners, crude, pesters others, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
17. Budgeting and property problems (loses things, poor money management, heavy smoker with insufficient funds, hoards things; poor care of personal belongings, theft, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
18. Sexual expression, problems (excessive sexual interest, inappropriate sexual comments, inappropriate sexual actions, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
19. Leisure problems (no interests, joins only if prompted, avoids organized activities, avoids social activities; avoids solitary pursuits (e.g. walking, reading etc.), other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
20. Problem solving style (manipulates, aggressive (exerts own rights at expense of others), bullies, passive/unassertive, other):
 0 Absent 1 Mild 2 Moderate 3 Severe
 Describe
21. Demands on nursing staff time (requests help too often, frequent physical complaints, frequent constant attention, bizarre; physical needs, frequent prn medication, other):
 0 Usual time 1 More time 2 Much more 3 Extremely demanding
 Describe

Medication use (prn)

Time out/ special attention, seclusion other non-medication prns

Patient strengths/special nursing concerns/problems

Nursing treatment plan and other comments

Other aspects

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