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Functional Recovery of Individuals With Serious Mental Illnesses: Development and Testing of a New Short Instrument for Routine Outcome Monitoring

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Objective: This article describes the development and testing of the Functional Recovery tool (FR tool), a short instrument for assessing functional recovery during routine outcome monitoring of people living with serious mental illnesses. *Methods:* To assess functional recovery, mental health professionals

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conducted semistructured interviews with people living with serious mental illnesses on three areas of social functioning: daily living and self-care, work and study, and social contacts. Functioning in each of these areas over the past 6 months was rated on a 3-point scale: 0 (independent), 1 (partially independent), and 2 (dependent). The dichotomous overall outcome of the tool is defined as independent functioning in all areas. We analyzed interrater and test–retest reliability, sensitivity to change, and correlations with constructs that are assumed to be similar to the FR tool (quality of life in daily living, work, and social contacts) or divergent from it (symptomatic functioning). *Results:* The FR tool was administered to 840 individuals with serious mental illnesses in Dutch mental health care services, 523 of whom were followed up for 1 year (response rate 62%). The tool was easy to complete and was appropriate for policy evaluation and practice. However, when it was combined with more elaborate instruments, it added little extra clinical information. Interrater and test–retest reliability, convergent and discriminant validity, and sensitivity to change were rated sufficient to good. ***Conclusions and Implications for Practice:*** The FR tool could be a useful measure of functional recovery in addition to current measures of symptomatic remission and personal recovery in routine outcome monitoring.

Keywords: social functioning, functional recovery, serious mental illnesses, routine outcome monitoring

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Since the turn of the century, various countries—including the Netherlands—have used routine outcome monitoring for treatment evaluation and to shape health policy regarding people with serious mental illnesses. By periodically assessing service users, routine outcome monitoring facilitates shared decision making on treatment. Its results can also be used to compare service outcomes for national health policies.

As the concept of recovery related to serious mental illnesses has become more important in mental health care, routine outcome monitoring should incorporate recovery-oriented instruments. These should transcend the traditional concept of recovery, which, defined as "total absence of symptoms," does no justice to the personal side of recovery and fails to acknowledge that illness and recovery are best described as a continuum (Drake, Noel, & Deegan, 2015; Lloyd, Waghorn, & Williams, 2008; Slade & Longden, 2015).

In recent years, this has led to the introduction of the more optimistic concept of symptomatic remission, which, by analogy with chronic somatic diseases such as asthma, addresses the fact that a state of remission can exist while some residual symptoms interfere with daily functioning (Andreasen et al., 2005; Heering et al., 2015; van Os, Burns, et al., 2006; van Os, Drukker, et al., 2006). Remission does not necessarily mean full recovery, which, according to van Os, Burns et al. (2006), is a longer-term, more comprehensive goal. Recovery is first of all a personal process in which individuals endeavor to resume their lives and overcome the challenges brought by their disorder (Anthony, 1993; Deegan,

1996; Shepherd, 1991). Its key components are finding and maintaining hope, reestablishing identity, building a meaningful life and connection with others, and taking responsibility (Andresen, Oades, & Caputi, 2003; Leamy, Bird, Le Boutillier, Williams, & Slade, 2011; Noordsy et al., 2002). Recovery can also be specified in a number of domains besides those of symptoms and personal recovery; they include the domains of physical health and cognitive functioning and the domain of social functioning (Lloyd, Waghorn, Best, & Gemmell, 2008; Westcott, Waghorn, McLean, Stratham, & Mowry, 2015), which is the focus of this article.

The many recovery measures developed in recent decades have had a wide variety of definitions and goals (Campbell-Orde, Chamberlin, Carpenter, & Leff, 2005; Shanks et al., 2013). However, many such measures overlook the perspective of people with serious mental illnesses, which include having a secure home, meaningful activities, and a supportive social network (Drake et al., 2015). In addition, no gold-standard measure of functional recovery has been developed, which is why it is recommend to test new ones that are short and easy to administer, valid in terms of real-world outcomes, and sensitive to change (Mausbach, Moore, Bowie, Cardenas, & Patterson, 2009).

In this context, Harvey and Bellack (2009) explored the idea of evaluating functional recovery in a remission model analogous to symptomatic remission. In their opinion, this could contribute to a more appealing, meaningful evaluation of the goals of mental health interventions. They define the outcome of functional recov-

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Preliminary results on this research were also published in Dutch in the *Dutch Journal of Psychiatry* (Wiersma et al., 2015).

Swildens and Visser share first authorship for this article.

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ery as remission of impairments in daily functioning with a focus on the three domains of residential and independent living, work, and social relationships for a period of at least 6 months (similar to the definition of symptomatic remission). Although it is possible to separate real-world outcomes and a person's ability to perform in these domains, the authors stress that the final index of functional recovery should be real-world outcome.

In the Netherlands, "remission" is also discussed as an inspiring concept for evaluating progress toward mental health goals focused on recovery. A national task force reached consensus on compiling a set of short instruments on the trinity of (1) symptomatic remission, (2) personal recovery, and (3) functional recovery to be included in a national scale for routine outcome monitoring targeting individuals with serious mental illness (SMI) across inpatient and outpatient treatment settings. One purpose of the taskforce is to evaluate progress toward the national objective of promoting recovery among people with SMIs (Phrenos Dutch National Remission Committee, 2014).

Although several excellent measures of role functioning and social inclusion have already been developed (such as Birchwood, Smith, Cochrane, Wetton, & Copestake, 1990; Lloyd et al., 2008; Stewart et al., 2010; Westcott et al., 2015), they are not a perfect fit with the criteria for this national instrument for routine outcome monitoring on functional recovery. Any new instrument should thus (a) focus on measuring real-world outcomes in daily living and self-care and in work, study, and social contacts; (b) be short and therefore easy to administer in combination with other instruments, thereby covering the full spectrum of recovery domains; and (c) have a dichotomous (yes/no) outcome for remission in impairments in functioning that is parallel to the concept of symptomatic remission.

In this study, we evaluated the validity, reliability, and usability of such an instrument, the Functional Recovery (FR) tool, a newly developed short instrument for routine outcome monitoring.

Method

Participants

The research was conducted between 2012 and 2013. The participants were mental health care organizations working in eight different regions of the Netherlands. These participants were identified from two sources: the records of service recipients in Flexible Assertive Community Treatment (F-ACT) teams (for the F-ACT model, see van Veldhuizen, 2007) and the records of organizations for sheltered and supported living ($n = 840$).

Under Dutch law, studies using anonymous data from questionnaires in routine outcome monitoring procedures do not require formal approval by the Medical Ethical Committee, nor is informed consent needed if these data are sampled without placing an additional burden on the service recipients (Mulder et al., 2010).

Development of the FR Tool

The Dutch national remission taskforce was developed with the purpose of reaching consensus on measures to be used in routine outcome monitoring for individuals with SMIs. Service users and

professionals were consulted on interim findings and participated in joint meetings.

The taskforce specified a number of criteria for an instrument for assessing social functioning: (1) focus on the main social recovery domains; (2) suitable for routine outcome monitoring across networks of inpatient, outpatient, and sheltered care; (3) easy to administer; (4) aggregation of information into a dichotomous rating (yes/no) covering a 6-month period; and (5) completed by service users and clinicians together. If the latter is not possible, selective loss to follow-up should be prevented by basing the assessment on other sources (relatives, medical records; Young, Grusky, Jordan, & Belin, 2000).

Functional recovery was assessed in three domains: (1) daily living and self-care, (2) work (including that performed at home by housewives and househusbands) and study, and (3) social contacts. The importance of these areas was broadly agreed upon by groups of professionals and service users who drafted the national action plan.

Scoring and Weighting

Schedule 1 (see online supplemental Appendix) presents a full description of the instrument. The FR tool can be administered jointly by the clinician and the individual. The scoring applies to the adult population, not to children or elderly people (> 65 years). For each domain, functional recovery is assessed from a social perspective. A crucial question for each individual concerns the level of functioning expected on the basis of his or her social context and age, that is, without reference to the limitations resulting from mental health problems. To assess functional recovery, it is also important to determine which skills an individual has for functioning autonomously for each domain without the help of others. When tasks are taken over by others, the rater has to decide if the individual is capable of doing these tasks independently if needed. Scores refer to the greater part of the time that has elapsed in the past 6 months. There are four scoring alternatives:

> Score 0: The problem is absent, and independent functioning is scored if no support is needed in this domain.
>
> Score 1: A problem is present that is marginal or covered by support.
>
> Score 2: A serious problem is present that is insufficiently covered by support.
>
> Score 9: Little or no information is available for assessing the domain.

To facilitate proper scoring, the instructions for the FR tool provide examples. The scores on the three separate domains are added to obtain a total sum score for functional recovery (score 0–6). A sum score of 0 indicates full functional recovery, a score of 1 indicates partial recovery, and higher scores (2–6) indicate no functional recovery. Ultimately, the overall outcome is a dichotomous score (0 vs. 1 or higher): "in or out of functional recovery."

Other Instruments Used to Measure Convergent and Discriminant Validity

Convergent and discriminant validity are both ways of assessing construct validity by examining the strength of the relationship between the scores that result from two different measures. Convergent validity is assumed if the expected association is found between two measures that are expected to point in the same direction (Westen & Rosenthal, 2003). Discriminant validity is assumed if there is a weak correlation between two measures that are expected to be dissimilar due to differences in the constructs measured or in the measuring procedures—for instance, if the measure is a self-report instrument or is based on an observer's rating (Eklund & Leufstadius, 2007; Eklund & Bejerholm, 2017).

In this study, we used several instruments that are often used in routine outcome monitoring procedures in the Netherlands (Delespaul, 2015) and can be used to evaluate discriminant validity (dissimilar constructs) and convergent validity (comparable constructs). It was assumed that instruments that measure the construct of psychiatric symptoms would be relatively dissimilar to the construct of the FR tool. This assumption was based on research outcomes that suggest a weak to moderate association between symptom remission and remission of limitations in daily functioning (McGurk & Mueser, 2004; Priebe, 2007; Sarfati et al., 2017; Ventura, Hellemann, Thames, Koellner, & Nuechterlein, 2009; Wunderink, Nieboer, Wiersma, Sytema, & Nienhuis, 2013).

Since social functioning and needs for care and quality of life in areas of daily living are more strongly associated (Drake et al., 2016; Salyers, Becker, Drake, Torrey, & Wyzik, 2004; Slade, Leese, Cahill, Thornicroft, & Kuipers, 2005), it was also assumed that instruments targeting them would be more comparable to the FR tool.

Measures Used for Symptomatic Remission

The following instruments were employed in the routine outcome monitoring in one or more of the participating organizations.

The Positive and Negative Syndrome Scale–8 (PANSS-8) contains a selection of eight core items from the total of 30 items in the PANSS (Kay, Fiszbein, & Opler, 1987). These items are delusions, unusual thought content, hallucinations, conceptual disorganization, mannerism, blunted affect, social withdrawal, and lack of spontaneity. The scoring options on a Likert scale vary between 1 (*absent*) and 7 (*extreme*). On the basis of the criteria of the U.S. and European schizophrenia remission working groups (Emsley, Chiliza, Asmal, & Lehloenya, 2011; van Os, Burns, et al., 2006; van Os, Drukker, et al., 2006), these eight core symptoms represent a level of impairment consistent with symptomatic remission of psychotic disorders. Following the instructions of the remission working groups, we dichotomized the eight PANSS items into remission or no remission. A score of less than 4 (moderate severity) on all items represents symptomatic remission; a score greater than or equal to 4 (moderate severity) on at least one item represents no remission (Andreasen et al., 2005).

The Health of the Nation Outcome Scales (HoNOS; Wing et al., 1998; Mulder et al., 2004) is used to measure health and social functioning of individuals with SMI. The HoNOS consists of 12 items on problems in behavior, impairment in functioning, psychiatric symptoms, and problems in social contacts, each rated on a 5-point scale: 0 (*no problem*), 1 (*minor problem*), 2 (*mild problem*), 3 (*moderate severe problem*), and 4 (*severe to very severe problem*). The 12 items are rated over a period of 2 weeks. Their sum provides a total score (range 0–48). The HoNOS has good psychometric characteristics. To validate our FR tool, we recategorized the three HoNOS symptom items (depression, psychotic problems, and other psychiatric problems) into a dichotomous rating of symptom remission (yes/no) following the method of Kortrijk, Mulder, Van der Gaag, and Wiersma (2012). If all three items were below the level representing a clinical problem (score of 0 or 1), a score of zero (in remission) was assigned. If at least one of the three HoNOS items had a score of 2 or higher, a score of 1 (no remission) was given.

A measurement of symptoms, the Brief Psychiatric Rating Scale–24 (BPRS-24; Ventura, Green, Shaner, & Liberman, 1993), was included only for one mental health organization. The BPRS is a scale that a clinician or researcher can use to measure depressive symptoms and positive and negative psychiatric symptoms. Each symptom is rated on a Likert scale between 1 (*no problem*) and 7 (*severe problem*). For our analysis, we calculated the mean total scale score.

The Global Assessment of Functioning (GAF; American Psychiatric Association, 1994) contains one item in the domain of symptoms and disabilities in daily life and a score range from 100 (high functioning) to 1 (severely impaired). A score ≥ 60 points indicates adequate functioning.

Measures Used With Regard to Functional Recovery

The HoNOS functioning subscale includes two items: problems in daily living skills and problems in social contacts. A score of 0 (remission) is assigned if these items are both < 2; a score of 1 (no remission) is assigned if at least one of the items has a score of 2 or higher.

The Camberwell Assessment of Need Short Appraisal Schedule (CANSAS) assesses service users' needs in the past month in 22 health and social-life domains (Slade et al., 2005). For each domain, possible ratings are unmet need (serious problem regardless of any help received), met need (no/moderate problem because of help given), no need, or not known. We used the service-recipient version (CANSAS-P) and analyzed the mean sum score for needs for care in three areas for which we combined the following CANSAS domains: daily living (housing, food, housekeeping, and self-care), work (daily activities and employment), and social contacts (social contacts and intimate relationships).

Quality of life was assessed using the Manchester Short Assessment of Quality of Life (MANSA; Priebe, Huxley, Knight, & Evans, 1999), a 16-item measure that comprises 4 objective and 12 subjective questions. The subjective items assess satisfaction with life as a whole, with job (or sheltered employment, training/ education, or unemployment/retirement), and with financial situation, number and quality of friendships, leisure activities, accommodation, personal safety, people the individual lives with (or living alone), sex life, relationship with family, physical health, and mental health. Each item is rated on a 7-point satisfaction scale, from 1 (*couldn't be worse*) to 7 (*couldn't be better*). The eight regional mental health organizations participating in the research used different local versions of the MANSA (with a selection of 7, 8, or all 12 scale items). The items of the MANSA

show large overlap with the domains of the FR tool. For the comparison with the FR tool, we calculated the mean scores on the available items.

Additional Information

Sociodemographic and other clinical characteristics were taken from service-recipient records that were updated yearly. We also added two questions (7-point Likert scale) on clinical relevance and difficulties in using the tool according to the raters in five of eight institutions ($n = 367$).

Data on the difficulty and relevance of the assessment (Likert scale 1–7) were available for 324 (88%) and 320 (87%) of the assessments in five institutions ($n = 367$).

Finally, for a combined test of interrater reliability and test–retest reliability, 106 service recipients participated in an extra measurement after 2 weeks. In most cases, the first rater was the responsible mental health nurse; in a small number of cases, it was a psychologist working as a research assistant. In most cases, the second rater was the individuals' psychiatrist or psychologist.

Procedures

The FR tool was administered together with the other instruments used in the yearly regular routine outcome monitoring procedures of one or more of the participating organizations. The FR tool was added at the end of the questionnaire for the clinicians after longer measures such as the CANSAS and HoNOS. The tool was completed by the clinician and patient together.

Statistical Analyses

Internal reliability of the FR tool was evaluated by examining Cronbach's alpha and the Spearman's rho correlations between three domains. For the combined test of interrater and test–retest reliability, we calculated the percentage of agreement and a weighted Cohen's kappa (a weight of 0.7 for a 1-point difference, instead of 0.5 unweighted). For the convergent and discriminant validity, we used descriptive and analytical statistics (percentages, chi-square test, Spearman's rho correlation, and analysis of variance). The significance level was set at $p < .05$. For the cutoff values of significant clinical change at the follow-up after 1 year, we calculated the reliable change based on the standard deviation of the sum score (0–6) of the FR tool at the start of the study and Cronbach's alpha.

Results

Characteristics of the Participants

The FR tool was administered in 2012 to 840 individuals with SMIs. Their characteristics are shown in Table 1. One year later, 523 of these individuals were followed up (62% of the baseline sample).

For the purposes of the 1-year follow-up, many service recipients could not be reached or were unable to participate because they were out of care, had moved to another region, had died, or were not willing to take part in the routine outcome monitoring again. In various respects, the composition of the group of partic-

Table 1

Sociodemographic and Clinical Characteristics of the Study Sample (n = 840)

Variable	Total *n*	%/*M*	*n*/*SD*
Age, mean *SD*	840	44.4	12.1
Male, % *n*	840	62.9	528
Dutch ethnicity, % *n*	648	79.5	515
Living situation, % *n*	801		
Alone		43.2	346
With others (e.g., partner/family)		27.0	216
Inpatient or sheltered living		29.8	239
Psychiatric diagnoses, % *n*	778		
Schizophrenia		63.2	492
Other psychotic disorder		13.9	108
Mood, bipolar, anxiety disorder		9.1	71
Personality disorder		4.9	38
Substance abuse or dependence disorder		4.5	35
Other disorder		4.4	34
Mental health care setting, % *n*	729		
Outpatient		67.4	491
Inpatient/admitted (short or long term)		26.6	194
Sheltered living			
Community		3.6	26
Institutional		2.5	18
Admitted involuntarily, % *n*	828	7.0	58

ipants who participated in the follow-up was different from the group that was lost to follow-up: The percentage of women was lower in the follow-up group (34% vs. 43% of the group that did not participate in the follow-up; $p < .05$), more participants were of non-Dutch origin (23% vs. 17%; $p < .05$), and of the participants in the follow-up, a smaller percentage had undergone involuntary hospital admission (5% vs. 10%; $p < .01$). At follow-up, levels of education, living situation, psychiatric diagnosis, mental health care settings, and the date-1 functional recovery level did not differ significantly between participants and nonparticipants at the follow-up assessment.

Outcome of FR Tool

A total sum score for functional recovery was calculated for almost all individuals except for 13 with an incomplete/invalid measurement on the FR tool (1.5%). There were high rates of functional recovery in the separate domains (a quarter to a third). The dichotomous overall score indicated that 14% of the individuals were in full functional recovery at the first measurement (see Table 2). Analyses of the relationship between demographic and diagnostic characteristics and the total score on the FR tool indicated that people in functional recovery were more likely to be female (18% vs. 11% men; $p = .013$), to have been born in the Netherlands (15% vs. 8%; $p = .027$), and to have been diagnosed with "other psychotic disorders" or other disorders (19% "other psychotic disorder" and 32% "other disorders" vs. 13% and 23%; $p = .012$). The service recipients' mean age and the raters' professional background were not significantly related to functional recovery.

Regarding the difficulty and relevance of the assessment, we found that scoring was reported to be easy in 93% of the 324 assessments (score 5–7 on Likert scale, mean score 6.3; $SD = 1.2$); 34% of the 320 assessments were considered relevant to other

Table 2

Functional Recovery (FR) per Domain: Daily Living and Self-Care, Work and Study, Social Contacts, and FR Total Score

Variable	FR: Daily living and self-care (*n* = 837)	FR: Work and study (*n* = 835)	FR: Social contacts (*n* = 830)	FR: Total score (*n* = 827)
Full recovery, % (*n*)	35.1 (294)	23.8 (199)	37.1 (308)	13.7 (113)
Partial/no recovery, % (*n*)	64.9 (542)	76.2 (636)	62.9 (522)	86.3 (714)

information gathered with instruments for routine monitoring and in clinical practice (score 5–7 on Likert scale, mean score 3.8; *SD* = 2.1).

On average, it took 7 minutes longer to administer the FR tool together with the other instruments for routine outcome monitoring than it did to administer these instruments alone.

Reliability

The internal reliability of the functional recovery scale was average to good (Cronbach's alpha = 0.70). The correlation between the domains was 0.42 for the living domain and the work and study domain, 0.44 for daily living and social contacts, and 0.45 for the FR work and study domain and the social contacts domain (all *p*s < .001).

The combined test of interrater reliability and test–retest reliability (*n* = 106) reported as a percentage agreement was good (91% for remission of impairments in daily living, 90% for remission in work and study, 89% for remission in social contact, and 90% as the total score of the FR tool). The weighted kappa values (a weight of 0.7) were acceptable: 0.68 for daily living, 0.62 for

work and study, and 0.55 for social contacts. The total score of the FR tool was 0.53.

Discriminant and Convergent Validity

In Table 3, the results of the analyses of discriminant and convergent validity are presented. Further examination of the results shows that symptomatic remission analyzed with the PANSS or the HoNOS symptomatic remission criteria gave the same outcome as the FR tool in respectively only 21% (41 of 197) and 17% (30 of 181) of the cases, while symptomatic nonremission was accompanied in many cases by functional nonrecovery: 90% (276 of 306) for PANSS and 90% (405 of 450) for HoNOS. Of persons in full functional recovery, 58% (41 of 71) were also in symptomatic remission according to the PANSS. Also, of the persons in functional nonrecovery, 36% (156 of 432) were in symptomatic recovery. As for the HoNOS symptomatic remission criteria, these percentages were respectively 40% (symptomatic remission of functional recovery cases: 30 of 75) and 27% (symptomatic remission of functional nonrecovery cases: 151 of 556).

Table 3

Functional Recovery (FR), Discriminant Validity, and Convergent Validity

Variable	FR: Full recovery	FR: Partial—no recovery	Significance
Discriminant validity			
SR-PANSS, % (*n*)	(*n* = 71)	(*n* = 432)	ρ = .15
Symptomatic remission (*n* = 197)	8.2 (41)	31.0 (156)	*p* = .001
No symptomatic remission (*n* = 306)	6.0 (30)	54.9 (276)	*n* = 503
SR-HoNOS, % (*n*)	(*n* = 75)	(*n* = 556)	ρ = .09
Remission (*n* = 181)	4.4 (30)	24.5 (151)	*p* = .021
No remission (*n* = 450)	6.5 (45)	64.6 (405)	*n* = 631
BPRS (mean score, *SD*)	32.8 (8.0)	46.1 (14.1)	ρ = .36
			p < .001
			n = 99
GAF (mean score, *SD*)	58 (13.0)	48 (13.4)	ρ = −.26
			p < .001
			n = 684
Convergent validity			
HoNOS functioning, % (*n*)	(*n* = 75)	(*n* = 555)	ρ = .19
Full remission (*n* = 239)	7.5 (47)	30.5 (192)	*p* < .001
Partial or no remission (*n* = 391)	4.4 (28)	57.6 (363)	*n* = 630
MANSA (mean score, *SD*)	5.2 (1.0)	4.8 (1.1)	ρ = −.12
			p < .001
			n = 761

Note. Values are presented as percentages or mean scores (absolute numbers/*SD*); significance in Spearman's rho (ρ). SR-PANSS = Symptomatic Remission-PANSS; SR-HoNOS = Symptomatic Remission-HoNOS; BPRS = Brief Psychiatric Rating Scale; GAF = Global Assessment of Functioning; HoNOS = Health of the Nation Outcome Scales; MANSA = Manchester Short Assessment of Quality of Life.

Agreement was also comparable for the separate FR domains, where the correlation was weak but statistically significant, ranging from $\rho = 0.09$ to 0.20. Functional recovery correlated also weakly with symptomatic remission according to a HoNOS total score ($\rho = 0.16$, $p < .001$) and according to the PANSS total score ($\rho = 0.23$, $p < .001$).

Examination of the relationships between functional recovery and continuous measures of functioning on the GAF and symptoms on the BPRS indicated stronger associations. Specifically, Spearman's correlations were statistically significant in all cases and in the expected direction. However, the associations were of moderate strength: -0.34 to -0.22 for the GAF and 0.31–0.39 for BPRS (but stronger than for symptomatic remission measured with PANSS).

As for convergent validity, the correlation of FR and HoNOS functioning (items on "social relationships" and "all-day living skills") was statistically significant (with $\rho = 0.19$ [Table 3]). Further examination showed that of the persons in full functional recovery according to the HoNOS ($n = 239$), 19.7% ($n = 47$) were also fully recovered according to the FR tool. In contrast to this finding, however, 92.8% ($n = 363$) of the nonrecovered patients according to the HoNOS functioning items ($n = 391$) were also not recovered according to the FR tool.

The mean scores on the domains of CANSAS-P "daily living," "work/activities," and "social contacts" were correlated with the outcome on the domains of the FR tool (measured with Spearman's rho; see Table 4). In particular, the domain of CANSAS-P on "daily living" supported the FR tool for "daily living" and the total score.

The MANSA correlated positively with functional recovery: The mean MANSA scores were the highest for "full functional recovery" (5.2) and the lowest for "nonrecovery" (4.8; $p < .001$).

Stability and Sensitivity to Change

The correlation between total scores of the FR tool at baseline and the follow-up after 1 year was statistically significant; this was the case for the dichotomous measure (functional recovery or nonrecovery, $\rho = 0.35$; $p < .01$, $n = 505$) and for the continuous maximum 0–6 sum score of the scale ($\rho = 0.50$; $p < .01$). On the 0–6 sum score, 32% of the individuals had the same scores, 35% had higher scores by 1 or more points (representing an improvement in terms of functional limitations), and 34% had lower scores by 1 or more points—in other words, they worsened. Thus, there was a change between the two measurement points for 68% of the patients. For both assessments, 6% of the individuals remained stable in full functional recovery (score 0).

Validation of the change in functional recovery status showed that changes in the total score were not or only weakly correlated with sociodemographic and clinical characteristics and changes in symptom scores (PANSS, HoNOS symptoms, and GAF) or changes in HoNOS functioning and quality of life (MANSA). There were no statistically significant relationships between the difference scores for functional remission based on the FR tool and the other scales. We define reliable change (95%) as a difference of 3 or more points between baseline and follow-up on the FR sum score (ranging 0–6). This applied to 14% of the participants.

Discussion

Outcomes

On the basis of our analyses, we conclude that the internal coherence of the three dimensions of functional recovery and the interrater reliability are adequate. The pattern of associations of the FR tool with the convergent instruments and the divergent instruments was not very strong; however, the results were in the expected direction. As for discriminant validity, symptomatic remission according to the PANSS or HoNOS symptom items coincided with functional recovery in one fifth of the cases, while the lack of symptomatic remission corresponded in almost all cases with functional nonremission. However, we also found that when symptomatic remission was absent, the chances of functional recovery were significantly lower. This means that symptomatic remission does appear to contribute to functional recovery.

Regarding convergent validity, functional recovery measured according to the HoNOS social functioning items had little overlap with remission of impairments according to the FR tool, while there was a large overlap between these two functional measures for nonremission. The CANSAS-P as a measure for need for care and functioning—with mean scores on the subareas of daily living, work, and social contacts—supported the comparable domains of the FR tool.

With respect to stability and sensitivity to change, the percentages for full remission and partial or no remission at the start of the study and 1 year later were practically the same. About one third of the service recipients improved between the two assessments, and similar proportions remained the same or deteriorated. In other words, there was a large change in the percentage of persons in functional recovery in the individuals with SMI between the two measurements (60%). However, the percentage of persons who exhibited a reliable change (by 3 points or more) was smaller,

Table 4

Functional Recovery (FR) Related to CANSAS: Domain and Total Score (Spearman's Rho)

Variable	FR: Daily living and self-care	FR: Work and study	FR: Social contacts	FR: Total score
CANSAS—living ($n = 106$)	.66**	.35**	.22*	.34*
CANSAS—work ($n = 96$)	.14	.22*	.05	.10
CANSAS—social contacts ($n = 95$)	.09	.11	.28**	.15

Note. CANSAS = Camberwell Assessment of Need Short Appraisal Schedule.
* $p < .05$. ** $p < .01$.

more than 10%, which seems to be consistent with the picture of the group of people with SMI. Only 6% remained stable and in full functional recovery.

Representativeness of the Sample

Considering the sociodemographic characteristics, the representativeness of the sample (excluding children and seniors) is good, although individuals with a psychotic disorder and inpatients in mental health care services and sheltered living organizations may be overrepresented relative to estimates of SMIs in the Netherlands' general population (Delespaul & de consensusgroep EPA, 2013). Information on our participants' characteristics was limited: For instance, it was impossible to retrieve from service-recipient records about whether a person actually worked or was studying. Roughly one in seven service recipients had been in full functional recovery over the past 6 months; in several domains, the proportion was over one third. This finding may indicate that full remission in impairments of functioning in separate domains is not unusual.

Our research also indicates that symptomatic and social limitations are moderately related and therefore also fluctuate semi-independently of one another. This is consistent with results of other Dutch studies (Kortrijk et al., 2012; Wunderink et al., 2013). Almost one fifth of the individuals with SMIs achieved symptomatic and functional recovery after 1 or 2 years, and half of those in functional recovery did not achieve symptomatic remission in the same period.

Comparison With Other Instruments

As we combined the testing of the tool with regular procedures for routine outcome monitoring, there was only limited overlap of comparable functional measures with the FR tool. The measures we used (Functional Remission-HoNOS, CANSAS, MANSA) did not yield outcomes that are well comparable.

It is important to consider how HoNOS is related to functional recovery, given that it is often used for routine outcome monitoring in long-term mental health care. In fact, the HoNOS is a hybrid instrument consisting of 12 items with highly varied content. The focus of the convergent validity lies in the two functional items on social relations and all-day living skills. Research shows a weak correlation between the two items and the FR tool. An important comment in this respect is that the content of the assessment of FR using HoNOS differs from that using the FR tool: While HoNOS covers a period of 2 weeks, the FR tool covers 6 months; while HoNOS is rated without regard to providing help and support, the FR tool assesses the independence of the service recipients without support. This is important, for instance, for people who live in residential settings for long-term care, who, due to their lengthy stay in supported living, may be in functional recovery according to HoNOS but not according to the FR tool.

As for the convergent validity, the CANSAS domains studied correlated most strongly with the comparable domains of the FR tool, particularly with respect to the domain of daily living, and to a lesser extent the domains of work and social contacts. The modest correlations were as could be expected since there was a difference in time frame between the FR tool (6 months) and CANSAS-P (past month), and since independent functioning and care needs are related but not identical concepts. For instance, one can function well at work and daily activities but still have care needs in these areas.

Scoring and Weighing

The question arises as to the relevance to mental health care practice of recovery scores of 1 (partial recovery) and 2 or above (no functional recovery). These scores could be used to set priorities in treatment and to determine the support level needed by a service-recipient group. According to our results, the sum score of the FR tool, which can range from 0 to 6, has no floor or ceiling problems (i.e., no accumulation of cases at the low or high ends of the scale) but is distributed equally over the seven categories. The distribution of scores over the entire range of the scale is favorable from a psychometric point of view (allowing greater change in scores). It also facilitates differentiation in the individual domains of functioning, which was also established by the FR total sum score rather than by the dichotomous overall score on the FR tool (yes/no).

Application in Clinical Practice and National Routine Outcome Monitoring

In two thirds of the cases, the clinicians were skeptical about the relevance of the FR tool to clinical practice, while one third found it to be of direct added value to treatment. The background to these responses is that many participants were long-time service users with the same teams and that the instrument had been combined with more elaborate instruments such as CANSAS-P. Adding an additional brief and global assessment in such cases did not always provide clinicians with additional information. However, we expect that the functional recovery tool also may be useful on a national level to evaluate progress toward the national objective of promoting recovery among people with SMIs.

When measuring symptomatic remission and functional recovery, routine outcome monitoring is not complete. It is important to include participants' perspectives on personal recovery (Davidson, Lawless, & Leary, 2005) by using instruments that address the subjective process dimension of recovery (e.g., Boevink, Kroon, Delespaul, & van Os, 2017; Neil et al., 2009).

Conclusion

This study of the FR tool supports its relevance as an additional instrument for routine outcome monitoring. In view of its validity and reliability, it can contribute to measuring functional recovery from a social perspective for this population. If it becomes part of regular procedures for routine outcome monitoring, it could be a useful addition to current measures of symptomatic remission and personal recovery.

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