

Research Article

Validity and reliability of the MEDYN questionnaire for evaluation of functioning in mental health clients receiving occupational therapy

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Background: A number of questionnaires are currently available for measuring functionality of mental health clients; however, they are complex, clumsy to use and impossible to compare to each other. There is a clear need for a simple and straightforward tool that uses quantitative measures. We formulated a questionnaire based on occupational, behavioural and cognitive theories to assess the functioning of psychiatric inpatients receiving occupational therapy.

Methods: Thirty-one patients hospitalised in a closed and an open ward and receiving occupational therapy were monitored during 4 weeks. Clinicians completed the questionnaire for each patient on a weekly basis.

Results: Interrater reliability was found to be generally high with correlations among the raters in the closed ward being higher than among those in the open ward. Both cognitive and general/social functioning improved over time and the improvement was associated with type of illness and duration of treatment.

Conclusions: The MEDYN questionnaire is a valid and reliable objective tool for functional assessment of this subgroup of patients.

KEY WORDS cognition, functional assessment, psychiatry, questionnaire design, social behaviour.

Introduction

Several questionnaires are currently available for measuring functionality of mental health clients. They are, however, complex, clumsy to use and impossible

to compare to each other. There is a clear need for a simple and straightforward tool that uses quantitative measures. Therefore, we formulated a questionnaire based on occupational, behavioural and cognitive theories to assess the functioning of psychiatric inpatients receiving occupational therapy. According to Fossey and Harvey (2001), the use of quantitative research methodologies is necessary as a basis for gaining increased understanding of the functioning and improvement of instrument development. According to the literature review, a test's results should be comparable with other test results, it should be accurate, easy to rate and quantitative, like the MEDYN. In this study, we present the MEDYN questionnaire, designed by our group (the questionnaire's name stands for the authors' initials) for assessing changes and improvements in functional ability in psychiatric inpatients during the course of occupational therapy. The aim of this paper is to describe the formulation of the questionnaire and its reliability and validity when used with hospitalised mental health clients. Our assumption is that the fact that assessments show improved functioning implies that the questionnaire was valid for examining patient functioning in occupational therapy.

Literature review

Deficits in social functioning are a defining characteristic of schizophrenia (American Psychiatric Association, 1994; Leary, Johnston & Owens, 1991; Toress, Mendez, Merino & Moran, 2002). Mueser, Bellack, Douglas and Wade (1991) suggest that social skills tended to improve moderately over time. The measurement of social functioning is important in assessing the ability of these individuals to live in community settings (Dickerson, Parente & Ringel, 2000). In a study of 94 outpatients with schizophrenia, Brekke (1992) found only modest correlation among the assessment of patients on the Global Assessment

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Scale (American Psychiatric Association), the Strauss and Carpenter Outcome Scale (Strauss & Carpenter, 1974), and the Role Functioning Scale (Goodman, Sewell, Cooley & Leavitt, 1993). Additional research has examined the concordance between ratings of individuals with schizophrenia and their caregivers with regard to the social functioning of the individuals with schizophrenia. Some studies suggest that the viewpoints of outpatients with schizophrenia differ from those of their caregivers (Massey & Wu, 1994; Sainfort, Becker & Diamond, 1996). Dickerson *et al.* (2000) studied the correlation among different instruments. They used the Social Functioning Scale (SFS) (Birchwood, Smith, Cochrane, Wetton & Copestake, 1990), the Multnomah Community Ability Scale (MCAS) (Dickerson, Friedman, Kordonski, Cisney & Origoni, 1998), and the Quality of Life Interview (QOLI) (Lehman, 1998) to evaluate 72 stable outpatients with schizophrenia. Their expectation, that the instruments would show a high degree of shared variance, was not supported by the results. The only limited overlap between the measures may be due to the fact that the questions vary among the instruments. For example, the MCAS is the only one inquiring about an individual's physical health, whereas the QOLI asks about monthly income and the person's perception of the adequacy of their finances, which none of the other measures deal with. The SFS asks about the person's participation in numerous specific recreational and community activities, items that are not included in any of the other instruments. The format of the questions varies as well among the instruments and that may have contributed too to the limited overlap among the measures. Even with items that share similar content, the questions are worded differently in the different measures. For example, the QOLI asks a series of yes-no questions about the individual's activities in the last week, whereas the SFS asks about activities over the last several months on a 4-point frequency scale. The SFS scale rates the individual's employment/occupational activity, with responses ranging from competitive employment to no activity; the MCAS contains an item about meaningful activity and not about employment per se; the QOLI has a section on work/school, but this is completed only if the respondent has engaged in competitive employment or some school activity over the last year.

Another possible reason for the lack of significant overlap between measures is the source of the ratings. Both the QOLI and the SFS are self-report instruments, whereas the MCAS is clinician rated.

Measures of social functioning are often imprecise, and are not designed to detect small changes in behaviour, which may allow an evaluation of a

service or treatment regime (Wykes & Sturt, 1986). The detection of small improvements in behaviour provides reinforcement for staff working with those patients and motivating them to continue behavioural or other treatment interventions.

Dickerson, Boronow, Ringel and Parente (1996) administered a battery of neurocognitive tests and assessed symptoms independently (PANSS: Positive and Negative Syndromes in Schizophrenia) (Kay, 1991) and social functioning (SFS) (Birchwood *et al.*, 1990) in 88 stable outpatients with schizophrenia. They found a significant correlation between neurocognitive and social functioning variables. Bellack (1992), Brenner, Hodel, Roder & Corrigan (1992) and Brekke, Ranie, Ansel, Lencz and Bird (1997) have suggested that poor social functioning in schizophrenia might be related to attention and cognition deficits in combination with dysfunctional reactions to social or environmental stressors. Social problem solving requires cognitive flexibility, which enables individuals to generate a range of interpersonal skills (Addington & Addington, 1999). This view suggests that social functioning consists of complex tasks, thus one would expect a relationship with complex cognitive processes. Wykes *et al.* (2003) investigated the durability of the effects of cognitive remediation therapy. They found that when cognitive improvements reached a criterion threshold, there were also improvements in social behaviour. Impairments in cognitive and social functioning result in pervasive disability at both the individual and the interpersonal levels (Penny, Mueser & North, 1995). Allen and Allen (1987) suggested that cognitive disabilities can be used to predict social functioning.

Cognitive impairment has long been identified as a core feature of schizophrenia (Kraepelin, 1919; Bleuler, 1950). According to Allen (1985), the role of the mental health occupational therapist is to assess the cognitive level, to adapt activities, and to modify the environment consistent with the desires, capabilities, and needs of the client. Cognitive impairment is related to the disease process itself and is not simply a product of active psychotic symptoms, neuroleptic medications, or duration of illness (Secrest, Wood & Tapp, 2000). The degree and type of cognitive deficits vary among individual patients (Goldberg *et al.*, 1990). Strong inferential evidence suggests that the extent of cognitive impairment widens sharply with the onset of psychotic illness (Bellack, Gold & Buchanan, 1999). Meltzer, Thompson, Lee and Ranjan (1996) suggested that there may be progressive deterioration in some cognitive areas during the course of the illness. The cognitive deficits persist during periods of remission. There is evidence that even after correction for problems in attention, there are persistent deficits

in learning (Kenny & Meltzer, 1991). People with schizophrenia have a harder time with planning and take longer to do it. On the other hand, they tend to be impulsive and react rashly and with a low level of accuracy (Morris, Rushe, Woodruffe & Murray, 1995).

Cognitive abilities such as judgement and comprehension have moderate positive relationships with functional performance (Fong, Chan & Au, 2001). Kotila, Waltimo and Niemi (1984) found support for the relationships between general cognition and poor functional performance. Silverstein, Fogg and Harrow (1991) found that better performance on cognitive measures was associated with better work outcomes over a 2-year period.

Assessing functioning is recommended for the development of individual care plans, for monitoring individual outcomes, or to evaluate services from a functional perspective (Fossey & Harvey, 2001). Andrews, Peters and Teesson (1994) and Stedman, Yellowlees, Mellsop, Clarke and Darke (1997) discuss the many assessments of functioning and of the related concepts of disability which have been developed, as illustrated by recent efforts to identify suitable measures for routine outcome assessment. Despite their frequent use, these concepts, and the distinctions between them, are poorly defined (Fisher, 1992; Lehman, 1996; Katsching, 1997). This lack of conceptual clarity raises questions about where the focus should be and whose viewpoint should be considered. These make the development of tools to measure functional outcomes a serious challenge. Functional measures need to be applicable, acceptable, and practical to administer routinely in mental health services, as well as reliable, valid, and sensitive to change (Andrews *et al.*; Stedman *et al.*).

One widely known global function scale is the Global Assessment Functioning (GAF), part of the Diagnostic and Statistical Manual (DSM) multi-axial diagnosis (American Psychiatric Association, 1994), in which social and vocational domains of functioning are combined with symptoms to give one aggregate score. Aggregate scores may be quite different depending on the domains included in global measures (Scott & Lehman, 1998). In addition, when global measures are used, it is impossible to separate symptomatology from dysfunction in everyday life, thus introducing measurement redundancy (Katsching, 1997). This also implies that change in functioning, as distinct from symptomatic improvement, or within different domains, is difficult to assess (Goldman, Skodol & Lave, 1992). Thus, improvements in functioning may go undetected, particularly when they occur within different domains at varying rates (Dickerson, 1997) as seems to happen in cases of people with schizophrenia (Harding, Zubin & Struss, 1992;

Davidson & McGlashan, 1997). So, global function measures are less useful for identifying functional difficulties, or improvements within specific domains of functioning (Dickerson, 1997). They may give the false impression of measuring functional domains. The Health of the Nation Outcome Scales (HoNos) (Wing *et al.*, 1998) was developed in the UK for service monitoring and evaluation (Stein, 1999). The HoNos comprises 12 scales that separately assess symptoms, behaviours, impairments, and functioning. Trauer *et al.* (1999) point out that these scales are conceptually complex, and so may be understood to varying degrees within teams. Ratings may be based on differing views of what is deemed important, and it is difficult to rate these complex areas as single items. Therefore, measures that focus more specifically on functioning and use several items to capture specific aspects of functioning have some advantages.

Method

The MEDYN questionnaire was designed by members of two occupational therapy clinics serving the open and closed wards of Geha Mental Health Center in Israel. MEDYN is an acronym of the authors' first names. The questionnaire consists of 18 items covering three areas: general/social behaviour, cognition, and task behaviour. All are rated on a scale of 1 (lowest level of functioning) to 5 (highest level). A sample of the MEDYN questionnaire is in Appendix I and the rating guide for the MEDYN questionnaire is in Appendix II.

The study used newly admitted patients. On admission to Geha Mental Health Center, patients were evaluated by a multidisciplinary team. They determined the diagnosis, prescribed the necessary medications, and scheduled the patient for occupational therapy. The MEDYN questionnaire was tested for consistency and validity with 31 patients, 19 from the closed ward and 12 from the open ward. Their demographic variables are described in Table 1. The majority of subjects (62%) were 45 years old or below, and over half were female. Most were single or separated/divorced, living with their family, and had had no military service. About 30% completed elementary school (8th grade), and 20% had some form of higher education. Over 77% had a previous history of psychiatric illness and 64.5% had schizophrenia. All diagnoses were made on the basis of the ICD-10 criteria. All patients were receiving medications.

The first occupational therapy session consisted of a patient interview and assessment and the objectives of the therapy were jointly developed. Next, the patients were given an occupational task suited to their cognitive level. Four occupational therapy

TABLE 1: *Distribution of the subjects by demographic variables*

Variable	No. of points	%
Age (year)		
18–30	8	25.80
31–45	11	35.48
46–65	6	19.35
> 66	6	19.35
Gender		
Male	13	41.93
Female	18	58.06
Family status		
Single	15	48.39
Married	6	19.35
Divorced/widowed	10	32.23
Children		
Yes	14	45.16
No	17	54.83
Living conditions		
With family	22	70.96
Alone	7	22.58
Hostel/institution	1	3.22
With friend	1	3.22
Education (year)		
< 8	9	29.03
8–10	5	16.12
10–12	10	32.25
> 12	7	22.58
Country of origin		
Israel	16	51.61
Other	15	48.38
Army service		
Yes	9	29.03
No	19	61.29
No information	3	9.67
Psychiatric past		
Yes	24	77.41
No	7	22.58
Hospitalisation duration (months)		
0–1	4	12.90
1–3	13	41.93
3–6	5	16.12
> 6	9	29.03
Diagnosis		
Schizophrenia	20	64.51
Affective disease	9	29.03
Personality disorder	1	3.22
Organic disorder	1	3.22

clinicians, two from the open ward and two from the closed ward, were asked to observe independently from each other, the study patients during task performance and to complete the questionnaire for each

TABLE 2: *Interrater reliability between the two wards (using Pearson's correlation coefficient)*

Item	Open ward	Closed ward
1	0.74	0.87
2	0.65	0.87
3	0.43	0.74
4	0.81	0.85
5	0.90	0.83
6	0.79	0.77
7	0.65	0.90
8	0.67	0.90
9	0.81	0.91
10	0.88	0.88
11	0.73	0.64
12	0.86	0.83
13	0.89	0.80
14	0.72	0.79
15	0.90	0.73
16	0.88	0.87
17	0.86	0.87
18	0.92	0.87

of them. Two independent referees then reviewed the ratings. The version that was used in the study is in Appendices I and II.

To test for questionnaire consistency was as follows: Each subject was observed by an occupational therapist during task performance in the occupational therapy clinic over a 4-week period. The clinician completed the questionnaire once weekly. Consistency for each item and among items was determined by Cronbach's alpha.

Results

Four occupational therapy clinicians, two from the open ward and two from the closed ward, were asked to observe the study patients during task performance and to complete the questionnaire for each of them. They did this work completely independently from each other. Two independent referees then reviewed the ratings.

Interrater reliability

Interrater reliability was examined for all 18 items separately using Pearson's correlation coefficient for the closed-ward and open-ward patients. The findings are presented in Table 2. It was found to be high with correlations between the raters in the closed ward being higher than between those in the open ward. Aside from the relatively low correlation for

TABLE 3: Item/total score coefficients and average of Cronbach's alpha values for each of the functioning categories

A. General/social behaviour

Items	Week 1	Week 2	Week 3	Week 4
1	0.72	0.67	0.68	0.50
2	0.75	0.67	0.68	0.82
3	0.81	0.86	0.78	0.77
4	0.72	0.74	0.61	0.64
5	0.31	0.48	0.44	0.60
6	0.80	0.81	0.73	0.83
Mean	0.87	0.88	0.86	0.88

B. Cognition

Items	Week 1	Week 2	Week 3	Week 4
7	0.60	0.69	0.74	0.71
8	0.61	0.60	0.69	0.73
9	0.77	0.70	0.82	0.74
10	0.61	0.68	0.80	0.86
Mean	0.82	0.83	0.89	0.89

C. Task behaviour

Items	Week 1	Week 2	Week 3	Week 4
11	0.56	0.39	0.59	0.74
12	0.74	0.45	0.25	0.62
13	0.79	0.81	0.62	0.76
14	0.81	0.64	0.40	0.64
15	0.55	0.42	0.27	0.53
16	0.33	0.34	0.39	0.44
17	0.73	0.68	0.65	0.86
18	0.46	0.43	0.49	0.63
Mean	0.86	0.80	0.76	0.88

item 3 ($r = 0.43$), the correlations between the two wards are nearly identical, with values ranging from $r = 0.65$ to $r = 0.95$.

Internal consistency

The internal consistency of the items in each category was examined by item analysis using Cronbach's alpha. Table 3 presents the coefficients of each of the items and the overall score of the category to which it belongs.

The internal consistency proved to be relatively high for all three categories and at all four time points ($r = 0.76$ to $r = 0.89$). A more detailed examination revealed that item 5 in the general/social behaviour category had a relatively low coefficient at the four time points, but was still within the acceptable range

TABLE 4: Pearson's correlation coefficient (r) for three categories

Category	Week 1	Week 2	Week 3	Week 4
Cognition with general/ social behaviour	0.64	0.69	0.58	0.62
Task behaviour with general/social behaviour	0.63	0.64	0.68	0.63
Task behaviour with cognition	0.70	0.77	0.79	0.84

($r > 0.30$). Several items in the task behaviour category had also relatively weak correlations with some differences among the various time points, other than the third week, when the correlations were higher than $r = 0.30$ ($P < 0.001$).

Intercategory correlations

To examine the association among the categories, the average rating of the items in each category was calculated separately. The higher the score, the better the functioning. These were then compared by Pearson's correlations. As shown in Table 4, the correlations between all the categories were very high. These findings show that a single, overall, general functioning score can be obtained from the questionnaire ($P < 0.001$).

Patients with depression received, on the average, a rating of 3.926 at baseline in general/social behaviour category, whereas people with schizophrenia received 3.108 in this category. Likewise in cognition, patients with depression scored 3.639 and patients with schizophrenia 3.213. The rating in task behaviour was 3.292 for patients with depression and 3.069 for people with schizophrenia. These differences in scores occur at all points of time. The final scores for patients with depression in all three categories were 4.426, 4.417, and 4.056, respectively, whereas for people with schizophrenia they were 3.354, 3.413, and 3.188, respectively ($P < 0.001$).

Validity

To examine the validity of the questionnaire, we compared the assessments of functioning in the three categories at the four time points. We assumed that if the assessments showed improved functioning, the questionnaire was valid for examining patient functioning in occupational therapy. To determine the significance of the differences between the four time points, one-way ANOVA with repeated measures was carried out for each category separately. The averages and standard deviations of the categories at each point of time as well as the results of the ANOVAs are presented in Table 5.

TABLE 5: Average and standard deviations of the categories of functioning

Categories	Week 1		Week 2		Week 3		Week 4		F
	m	SD	m	SD	m	SD	m	SD	
General/social behaviour	3.40	0.81	3.51	0.78	3.70	0.74	3.68	0.82	5.56*
Cognition	3.40	0.81	3.48	0.79	3.64	0.89	3.77	0.93	4.68*
Task behaviour	3.17	0.79	3.27	0.67	3.40	0.62	3.47	0.81	2.49

* $P < 0.001$; m, mean; SD, standard deviation.

Significant differences were found between the time points for the general/social behaviour and cognition categories. Cognitive functioning improved over the 4 weeks, whereas general/social behaviour functioning improved in the last 2 weeks. Numan-Kueles analysis yielded significant differences between all time points for the cognition category, and between the first two and the next two time periods for the general/social behaviour category. These findings are consistent with the hypothesis of the study, that cognitive functioning and social behaviour would improve in the course of the therapy. They are not consistent with the assumption that task functioning would improve. Patients with depression received on the average a higher rating at baseline in general/social behaviour category than people with schizophrenia in this category. Likewise in cognition, patients with depression scored higher than those with schizophrenia. The rating in task behaviour was higher for patients with depression than for people with schizophrenia. These differences in scores occur at all points in time. The final scores for patients with depression in all three categories were higher than people with schizophrenia.

The limitation of the study is that it took place for only a 4-week period.

Discussion

This paper describes the construction and application of the MEDYN questionnaire for assessing and following changes in functioning in mental health clients undergoing occupational therapy. The results indicate that the questionnaire is a reliable tool with high interitem reliability in all three categories that were evaluated: general/social behaviour (six items), cognition (four items), and task behaviour (eight items). In addition, no association was found between the evaluation of functioning and between gender, army service, or country of origin, thereby indicating that the questionnaire is free of demographic influence.

The questionnaire revealed differences between patients with depression and patients with schizophrenia, with the former achieving higher ratings in all categories at all time points. Patients with depression received on average a rating of 3.926 at baseline in general/social behaviour category, whereas people with schizophrenia received 3.108 in this category. Likewise in cognition, patients with depression scored 3.639 and those with schizophrenia 3.213. The rating in task behaviour was 3.292 for patients with depression and 3.069 for people with schizophrenia. These differences in scores occur at all points of time. The final scores for patients with depression in all three categories were 4.426, 4.417, and 4.056, respectively, whereas for people with schizophrenia they were 3.354, 3.413, and 3.188, respectively. These findings are consistent with the conclusions of Allen (1985) that people with schizophrenia have greater cognitive impairment than those with depression.

Nevertheless, our findings show that whatever the diagnosis, improvement in patient functioning is positively correlated with the duration of treatment. When each area of functioning was analysed separately we found a consistent improvement in all items in the cognition category from the start of the evaluations, whereas in the general/social behaviour category, improvement began only in the middle of the study period (after 2 weeks). No improvement was found in task functioning. We believe the improvement in cognition stems in part from the patient receipt of psychiatric medication and in part from the natural course of recovery, both of which increase information processing capacity (Allen, Earhart & Blue, 1992). Medication suppresses the more severe symptoms of psychosis, such as associative thinking, delusions, and hallucinations (Munitz, 1995), and this enables patients to start organising cognitively. Furthermore, the initial emphasis in occupational therapy is on cognitive functioning, and the treatment focuses on attention, organisation, problem solving, and learning ability. Each of these components improves cognitive ability from the onset of the treatment.

According to Katz (1992), every cognitive disturbance can cause the individual to deteriorate from full functioning to non-functioning. Cognitive understanding and a correct interpretation of the situation help improve social skills. Therefore in our study, the onset of improvement in general/social behaviour functioning only in the middle of the trial period can be explained by the fact that cognition needed to be improved first in order to enable the patients to change their general/social behaviour.

Regarding the lack of change in task behaviour, Allen (1985) claimed that changes in cognition are reflected in qualitative changes in the task performance. Being

that task performance requires a high level of organisation, and a high level of organisation can be acquired only after prolonged treatment, four weeks of observation were probably not long enough to allow for an improvement in task functioning. Further analysis over a longer term is needed to draw conclusions concerning this area. Nevertheless, we would expect a positive change in light of our finding that as treatment progresses, the overall results improve.

Future studies should compare patient behaviour in occupational therapy with the behaviour on the ward (NOSIE Nursing Questionnaire) (Honigfeld, Gillis & Klett, 1965), and should evaluate caretakers' evaluations (Brief Psychiatric Rating Scale) (Overall & Gorham, 1962) as well as other treatments (Hamilton Rating Scales for depression and anxiety) (Hamilton, 1967).

Conclusion

In summary, the MEDYN questionnaire is a promising adjunctive tool for evaluating functioning in mental health clients receiving occupational therapy. The questionnaire enables the clinicians to attain a weekly profile of the patient's level of functioning in different areas in the form of a single score. It can be used to chart improvement in the course of hospitalisation. The questionnaire is reliable and valid, easy to complete and does not require special resources.

References

- Addington, J. & Addington, D. (1999). Neurocognitive and social functioning in schizophrenia. *Schizophrenia Bulletin*, 25, 173–182.
- Allen, C. K. (1985). *Occupational therapy for psychiatric diseases: Measurement and management of cognitive disabilities*. Boston/Toronto: Little Brown.
- Allen, C. K. & Allen, R. E. (1987). Cognitive disabilities: Measuring the social consequences of mental disorders. *Clinical Psychiatry*, 48, 185–190.
- Allen, K. C., Earhart, A. C. & Blue, T. (1992). *Occupational therapy. Treatment goals for physically and cognitively disabled*. Rockville, MD: American Occupational Therapy Association Inc.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, D.C.: Author.
- Andrews, G., Peters, L. & Teesson, M. (1994). *Measurement of consumer outcome in mental health: A report to the National Mental Health Information Strategy Committee*. Sydney: Clinical Research Unit for Anxiety Disorders.
- Bellack, A. S. (1992). Cognitive rehabilitation for schizophrenia. Is it possible? Is it necessary? *Schizophrenia Bulletin*, 18, 43–50.
- Bellack, A. S., Gold, J. M. & Buchanan, R. W. (1999). Cognitive rehabilitation for schizophrenia: Problems, prospects, and strategies. *Schizophrenia Bulletin*, 25, 257–274.
- Birchwood, M., Smith, J., Cochrane, R., Wetton, S. & Copestake, S. (1990). The Social Functioning Scale: The development and validation of a new scale of social adjustment for use in family intervention programmes with schizophrenic patients. *British Journal of Psychiatry*, 157, 853–859.
- Bleuler, E. (1950). *Dementia praecox or the group of schizophrenias*. New York: N. Y. International Universities Press.
- Brekke, J. S. (1992). An examination of the relationship among three outcome scales in schizophrenia. *The Journal of Nervous and Mental Disease*, 180, 162–167.
- Brekke, J. S., Ranie, A., Ansel, M., Lencz, T. & Bird, L. (1997). Neuropsychological and psychophysiological correlates of psychosocial functioning in schizophrenia. *Schizophrenia Bulletin*, 23, 19–28.
- Brenner, H. D., Hodel, B., Roder, V. & Corrigan, P. (1992). Treatment of cognitive dysfunction and behavioral deficits in schizophrenia. *Schizophrenia Bulletin*, 18, 21–26.
- Davidson, L. & McGlashan, T. H. (1997). The varied outcomes of schizophrenia. *Canadian Journal of Psychiatry*, 42, 34–43.
- Dickerson, F. B. (1997). Assessing clinical outcomes: The community functioning of persons with serious mental illness. *Psychiatric Services*, 48, 897–902.
- Dickerson, F., Boronow, J. J., Ringel, N. & Parente, F. (1996). Neurocognitive deficits and social functioning in outpatients with schizophrenia. *Schizophrenia Research*, 21, 75–83.
- Dickerson, F. B., Origoni, A. E., Pater, A., Friedman, B. K., Kordonski, W. M. (2003). An expanded version of the Multnomah Community Ability Scale: Anchors and interview probes for the assessment of adults with serious mental illness. *Community Mental Health Journal*, 39, 131–137.
- Dickerson, F. B., Parente, F. & Ringel, N. (2000). The relationship among three measures of social functioning in outpatients with schizophrenia. *Journal of Clinical Psychology*, 56, 1509–1519.
- Fisher, A. G. (1992). The foundation-functional measures, part 1: What is function, what should we measure, and how should we measure it? *American Journal of Occupational Therapy*, 46, 183–185.
- Fong, K. N. K., Chan, C. C. H. & Au, D. K. S. (2001). Relationship of motor and cognitive abilities to functional performance in stroke rehabilitation. *Brain Injury*, 15, 443–453.
- Fossey, E. M. & Harvey, C. A. (2001). A conceptual review of functioning: Implications for the development of consumer outcome measures. *The Australian and New Zealand Journal of Psychiatry*, 35, 91–98.
- Goldberg, T. E., Ragland, D., Torrey, E. F., Gold, J. M., Bigelow, L. B. & Weinberger, D. R. (1990). Neuropsychological assessment of monozygotic twins discordant for schizophrenia. *Archives of General Psychiatry*, 47, 1066–1072.
- Goldman, H. H., Skodol, A. E. & Lave, T. R. (1992). Revising axis V for DSM-IV. A review of measures of social functioning. *American Journal of Psychiatry*, 149, 1148–1156.
- Goodman, S. H., Sewell, D. R., Cooley, E. L. & Leavitt, N. (1993). Assessing levels of adaptive functioning: The role functioning scale. *Community Mental Health Journal*, 29, 119–131.
- Hamilton, M. (1967). Development of a rating scale for primary depressive illness. *British Journal of Social and Psychology*, 6, 278–296.

- Harding, C. M., Zubin, J. & Struss, J. S. (1992). Chronicity in schizophrenia revisited. *British Journal of Psychiatry*, *161*, 27–37.
- Honigfeld, G., Gillis, R. D. & Klett, C. J. (1965). Nurses' observation scale for inpatient evaluation: A new scale for measuring improvement in chronic schizophrenia. *Journal of Clinical Psychology*, *21*, 65–71.
- Katsching, H. (1997). How useful is the concept of quality of life in psychiatry? *Current Opinion in Psychiatry*, *10*, 337–345.
- Katz, N. (1992). *Cognitive rehabilitation models for intervention in occupational therapy*. Boston: Andover Medical Publishers.
- Kay, S. R. (1991). *Positive and negative syndromes in schizophrenia: Assessment and research*. New York, NY: Bruner/Mazel.
- Kenny, J. & Meltzer, H. Y. (1991). Attention of higher cortical functions in schizophrenia. *Journal of Neuropsychiatry and Clinical Neuroscience*, *3*, 269–275.
- Kotila, M., Waltimo, O. & Niemi, M. L. (1984). The profile of recovery from stroke and factors influencing outcome. *Stroke*, *15*, 1039–1044.
- Kraepelin, E. (1919). *Dementia praecox and paraphrenia*. Livingstone, E: R. M. Barclay.
- Leary, J., Johnston, E. C. & Owens, D. G. C. (1991). Social outcome. *British Journal of Psychiatry*, *159*, 13–21.
- Lehman, A. F. (1996). Measures of quality of life among persons with severe and persistent mental disorders. *Social Psychiatry and Psychiatric Epidemiology*, *31*, 78–88.
- Lehman, A. F. (1998). A quality of life interview for the chronically mentally ill. *Evaluation and Program Planning*, *11*, 51–62.
- Massey, O. T. & Wu, L. (1994). Three critical views of functioning: Comparisons of assessments made by individuals with mental illness, their case managers, and family members. *Evaluation and Program Planning*, *17*, 1–7.
- Meltzer, H. Y., Thompson, P. A., Lee, M. A. & Ranjan, R. (1996). Neuropsychologic deficits in schizophrenia, relation to social function and effect of antipsychotic drug treatment. *Neuropsychopharmacology*, *14*, 27s–33s.
- Morris, R. G., Rushe, T., Woodruffe, P. W. R. & Murray, R. M. (1995). Problem solving in schizophrenia: A specific deficit in planning ability. *Schizophrenia Research*, *14*, 235–246.
- Mueser, K. T., Bellack, A. S., Douglas, M. S. & Wade, J. H. (1991). Prediction of social skill acquisition in schizophrenic and major affective disorder patients from memory and symptomatology. *Psychiatry Research*, *37*, 281–296.
- Munitz, H. (1995). *Selected chapters in psychiatry*. Tel Aviv, Israel: Papyrus Publishing House, Tel Aviv University.
- Overall, J. E. & Gorham, D. R. (1962). The brief psychiatric rating scale. *Psychological Reports*, *10*, 799–812.
- Penny, N. H., Mueser, K. T. & North, C. T. (1995). The Allen cognitive level test and social competence in adult psychiatric patients. *The American Journal of Occupational Therapy*, *49*, 420–427.
- Sainfort, F., Becker, M. & Diamond, R. (1996). Judgments of quality of life of individuals with severe mental disorders: Patients self-report versus provider perspectives. *American Journal of Psychiatry*, *153*, 497–502.
- Scott, J. E. & Lehman, A. F. (1998). Social functioning in the community. In: K. T. Mueser & N. Tarrier (Eds.). *Handbook of social functioning in schizophrenia*. Boston: Allyn and Bacon.
- Secrest, L., Wood, A. E. & Tapp, A. (2000). A comparison of the Allen cognitive level test and the Wisconsin card sorting test in adults with schizophrenia. *The American Journal of Occupational Therapy*, *54*, 129–133.
- Silverstein, M. L., Fogg, L. & Harrow, M. (1991). Prognostic significance of cerebral status: dimensions of clinical outcome. *Journal of Nervous and Mental Disease*, *179*, 534–539.
- Stedman, T., Yellowlees, P., Mellsop, P., Clarke, R. & Darke, S. (1997). *Measuring consumer outcomes in mental health. Field testing of selected measures of consumer outcomes in mental health*. Canberra: Department of Health and Family Services.
- Stein, G. S. (1999). Usefulness of the Health of the Nation Outcome Scales. *British Journal of Psychiatry*, *174*, 375–377.
- Strauss, J. S. & Carpenter, W. T. (1974). The prediction of outcome in schizophrenia: Characteristics of outcome. *Archives of General Psychiatry*, *27*, 739–746.
- Toress, A., Mendez, L. P., Merino, H. & Moran, E. (2002). Improving social functioning in schizophrenia by playing the train game. *Psychiatric Services*, *53*, 799–801.
- Trauer, T., Callaly, T., Hantz, P., Little, J., Shields, R. & Smith, J. (1999). Health of the Nation Outcome Scales: Results of the Victorian field trial. *British Journal of Psychiatry*, *174*, 380–388.
- Wing, J., Beevor, A. S., Curtis, R. H., Park, S. B. G., Hadden, S. & Burns, A. (1998). Health of the Nation Outcome Scales: Research and development. *British Journal of Psychiatry*, *172*, 11–18.
- Wykes, T., Reeder, C., Williams, C., Corner, J., Rice, C. & Everitt, B. (2003). Are the effects of cognitive remediation therapy (CRT) durable? Results from an exploratory trial in schizophrenia. *Schizophrenia Research*, *61*, 163–174.
- Wykes, T. & Sturt, E. (1986). The measurement of social behaviour in psychiatric patients: An assessment of the reliability and the validity of the SBS schedule. *British Journal of Psychiatry*, *148*, 1–11.

Appendix I: Questionnaire for evaluation of functioning in mental health clients (MEDYN)

Select the most appropriate response for all items:

1. Not at all
2. Very little
3. Partial
4. Almost completely
5. Completely

Note: See explanatory notes for items A–F and O–R.

General/social functioning

- A. Appearance — clean, neat, appropriate clothing
- B. Behaviour appropriate to the situation
- C. Varied and suitable expression, verbal and nonverbal
- D. Independence in all ward activities
- E. Cooperation in planning and implementing the treatment program with the caretaker
- F. Ability to relate

Cognition

- G. Attention — attentive to the task while filtering out extraneous stimuli
- H. Organization — ability to cope with the non-human environment
- I. Problem solving at work, on his/her own
- J. Learning ability — ability to comprehend instructions without difficulty, in accord with his/her level

Task behaviour

- K. Initiative — participates actively in the decisions and activities involved in his/her treatment
- L. Precision — keeps to schedule and follows the rules
- M. Continuity in working
- N. Appropriate level of expectations — functional ability
- O. Appropriate satisfaction with completed product
- P. Ability to delay gratification and tolerate frustration
- Q. Work output
- R. Independence at work

Appendix II: Rating guide for the MEDYN questionnaire

- A. Appearance
 - hair unwashed
 - hair uncombed
 - body unwashed
 - bizarre appearance
 - sloppy

Note: The highest score is if no above items are related to the patient, the lowest score is if 5 to 6 above items are related to him/her.

Score	Items
1	5-6
2	3-4
3	2
4	1
5	0

- B. Behaviour appropriate to the situation
 - catatonic
 - too cut off or interferes in what is going on around him/her
 - bizarre
 - inappropriate laughing or crying
 - too quiet or too loud
 - doesn't observe interpersonal boundaries

Score	Items
1	6-7
2	4-5
3	2-3
4	1
5	0

- C. Varied and suitable expression, verbal and nonverbal
 - Score
 - 1 flat and totally inappropriate
 - 2
 - 3
 - 4
 - 5 varied and totally appropriate
- D. Independence in all ward activities
 - washing
 - dressing
 - eating
 - making bed
 - orientation in the ward and surroundings

Score	Items
1	5
2	4
3	2-3
4	1
5	0

- E. Cooperation in planning and implementing the treatment program with the caretaker
 - Score
 - 1 doesn't plan or carry out
 - 2 little planning and little carrying out
 - 3 either complete planning or complete carrying out
 - 4 either planning or carrying out are complete, while the other is partial
 - 5 complete planning and complete carrying out
- F. Ability to relate
 - Score
 - 1 does not relate at all, either verbally or otherwise
 - 2 relates non-verbally and non-continuously
 - 3 partial verbal relating to caretakers and/or patients
 - 4 relates well to caretakers or patients
 - 5 relates well to caretakers and patients

- L. Precision — keeps to schedule and follows the rules
 - Score
 - 1 not present at all or goes only to the coffee corner or peeks into occupational therapy without doing anything
 - 2 functions about one-fourth of the time
 - 3 functions about half of the time
 - 4 functions about three-fourths of the time
 - 5 functions during all hours of the activity

- M. Continuity in working
 - Score
 - 1 does not function at all
 - 2 works for a few minutes each time
 - 3 works about half the time of the session or continuously for reasonable amounts of time
 - 4 functions most of the time
 - 5 works continuously throughout the sessions

- N.** Appropriate level of expectations — functional ability
- 1 expectations not appropriate to ability to function
 - 2 expects to function at too high or too low level
 - 3 tries to work at a higher or lower level than his/her capacity
 - 4 expects to work slightly above or below his/her capacity
 - 5 expectations appropriate to ability to function
- O.** Appropriate satisfaction with completed product
- Score
- 1 total mismatch between level of satisfaction and the finished product
 - 2 poor match between level of satisfaction and the finished product
 - 3 reasonable match between level of satisfaction and the finished product
 - 4 good match between level of satisfaction and the finished product
 - 5 total match between level of satisfaction and the finished product
- P.** Ability to delay gratification and tolerate frustration
- Score
- 1 none at all
 - 2
 - 3
 - 4
 - 5 completely able to delay gratification and tolerate frustration
- Q.** Work output by time and by complexity of work relative to the norm
- R.** Independence at work
- Score
- 1 does not plan at all; needs endless instructions and many demonstrations
 - 2 does not plan and does little even with help
 - 3 needs help in planning or doing
 - 4 either plans independently and needs some help in doing, or the reverse
 - 5 plans and works without repeated instructions