Disability in Schizophrenia: Contributing Factors and Validated Assessments

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Patients with schizophrenia experience impairments in multiple domains of everyday life, including the ability to maintain social relationships, sustain employment, and live independently. These impairments typically persist after patients achieve symptom remission. Assessment of patients' functioning requires multiple information sources (such as the patient, a relative, or a case worker) and performance-based measures. Functional milestones (for example, marriage or a job) are not highly related to each other and require separate assessments. Clinicians could enhance their practice by being familiar with assessment tools, such as the University of California, San Diego, Performance-Based Skills Assessment (UPSA) and the MATRICS Consensus Cognitive Battery, which are designed to evaluate real-life skills and cognitive abilities. Although often considered together, cognitive and negative symptoms appear to have differential effects on domains of functioning and likely require separate treatment interventions. With targeted therapies and frequent contact with supportive clinicians, there is increasing evidence that patients can improve in their functioning in crucial areas that impact their quality of life.

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Disability in people with schizophrenia is pervasive, affecting social, vocational, and residential domains.[1] Impairments in these domains are present over the course of illness and are evidenced by reductions in achieving functional milestones common in the general population, such as independent living, marriage, and employment.[2] As treatment goals shift from symptom remission to recovery in these functional areas, clinicians must begin to understand the dimensions of functional impairment, increase familiarity with assessments of functional disability, and understand the predictors of functioning in order to help patients with schizophrenia live as full a life as possible.

DIMENSIONS OF FUNCTIONAL IMPAIRMENT

The majority of people with schizophrenia are functionally disabled at the time of their first episode, and successful treatment of psychotic symptoms does not guarantee or even predict functional recovery. For example, in a study[3] of first-episode patients with schizophrenia or schizoaffective disorder (N = 118), 90 had achieved symptom remission at some point during the 5-year follow-up, while only one-quarter achieved sustained social and vocational functioning, and about one-eighth met full recovery criteria for 2 years or longer (Figure 1).[3]

Objective Impairments

Objective impairments are measurable areas that represent typical milestones for the general population. The first area is occupational impairment, which may be present at illness onset and remain even after treatment.[2] A study[2] in patients with schizophrenia or schizoaffective disorder (N = 238) uncovered that about 70% of patients (both with and without neuropsychological impairment) were unemployed, and only about 20% were working at competitively obtained jobs. Another study[4] found that 81% of patients with schizophrenia had worked for pay part-time or full-time at some time in their life, while only 12% were currently competitively employed.

Another area of impairment is social function, which encompasses social relations as well as romantic and long-term relationships. In a study[4] of 195 participants with schizophrenia, 54% had experienced marriage or an equivalent relationship at some previous point.[4] Multiple symptom domains are implicated in the occurrence of social deficits, but patients generally continue to experience social deficits even after achieving remission from positive symptoms.[5]

A third area of functioning is self-care, which spans the entire domain from handling basic and instrumental activities of everyday living (eg, shopping, preparing meals) to managing transportation and medications.[6] Patients with schizophrenia typically struggle to follow their treatment regimens accurately, leading to greater risk of relapse and poor outcomes.[6] Another aspect of self-care is independent living. Harvey and colleagues[4] found that about 60% of study participants were living independently and over 40% were financially responsible for their residence, although these patients were generally receiving disability compensation.[6]

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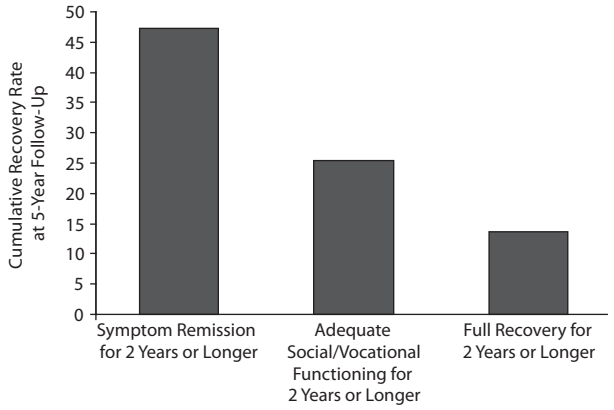
Clinical Points

- Functional skills deficits can hinder patients in occupational, social, self-care, and independent living domains.
- Assessment using multiple sources, including performance-based measures, is the best way to gauge disability in schizophrenia.
- Cognitive deficits and negative symptoms both predict functional impairment, but they affect different functional domains and require separate interventions.

Figure 1. Level of Recovery Achieved by Patients (N = 118) After Their First Episode of Schizophrenia or Schizoaffective Disorder[a]



[a]Data from Robinson et al.[3]

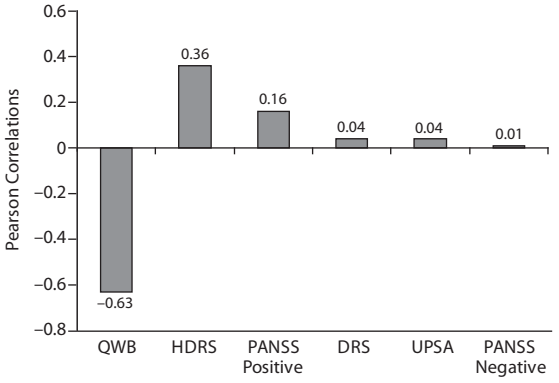
Subjective Impairments

Subjective impairments include perceived illness burden and impressions of the quality of life. Multiple studies[7,8] have indicated that subjective illness burden in schizophrenia is smaller than would be expected from the substantial deficits seen in objective functioning. Further, subjective quality of life and illness burden do not correlate well with objective information, including lifetime achievements and functional abilities measured with performance-based tests (Figure 2).[7] Thus, it is important to examine subjective impressions because of their potential to influence behavior such as medication adherence and motivation, but these impressions do not predict the patients' ability to perform everyday tasks and function socially.

ASSESSMENTS OF FUNCTIONAL DISABILITY

Patients with schizophrenia require new interventions to improve everyday functioning, and new medications and therapy options are being explored to meet this need. Before implementing an intervention, clinicians must evaluate which domains need improvement. Strategies for assessing real-world functioning include patient and informant reports, direct observation, objective information, and performance-based assessments.[9]

Figure 2. Correlations of Disability Scores With Psychiatric Symptoms, Cognitive Performance, and Everyday Functioning in Patients With Schizophrenia (N = 54)[a]



[a]Data from McKibbin et al.[7]
Abbreviations: DRS = Dementia Rating Scale, HDRS = Hamilton Depression Rating Scale, PANSS = Positive and Negative Syndrome Scale, QWB = Quality of Well-Being, UPSA = University of California, San Diego, Performance-Based Skills Assessment.

Patient and Informant Reports

The first strategy is patient self-report, but it is also the least reliable. Patients with schizophrenia are often unable to provide accurate self-reports about their functioning. Between 50% and 80% of patients with schizophrenia do not realize the significance of the clinical symptoms of their illness. Impaired insight may also impact self-assessment of cognitive impairments and functional abilities.[9] For example, in a study[9] of patients' self-assessment accuracy in real-world functioning, the patients who had never been employed rated themselves as equally or more capable in vocational skills than did those who had been employed. Another study[10] revealed that 36% of patients accurately rated their functional skills compared with objective assessments, while 40% overestimated and 24% underestimated their abilities. This propensity to misestimate their abilities makes patient self-reports less reliable than other assessment methods. Sabbag and colleagues[11] found that when patients rated their functioning across 6 everyday functioning status scales, their self-reports only minimally correlated with their performance on objective tests.

Reports from an informant who knows the patient well are another source of information. Informants may be a friend, family member, case manager, or other clinician who has frequent contact with the patient. In a study by Sabbag and colleagues,[11] ratings from both friend/relative informants and high-contact clinicians were also collected in addition to patient self-reports. The clinicians provided ratings of everyday functioning that were better correlated with patients' performance scores than were the reports from friend or relative informants. Reports from friends and relatives about patients' functioning were minimally correlated with the patients' self-reports and also poorly correlated with the patients' actual performance.

Bowie et al[10] found that case manager ratings of patients' social skills and work were highly correlated with performance on functional capacity and social skills measures. Although many factors may contribute to a patient's everyday functioning, such as opportunity, disability compensation, or other environmental factors, the evidence to date suggests that clinicians should compile systematic observations of patients' functioning over time and not rely exclusively on reports from patients or their friends and relatives.

Direct Observation and Objective Information

Direct observation of patients in naturalistic settings (for example, at work) would be ideal but is impractical and too time consuming for most clinicians.[12] In the recent past, advances in technology have allowed for direct observation in a remotely deliverable format. For instance, smart phone technology allows for systematic and regular assessments of people with schizophrenia as they undergo their daily activities. As technology becomes less expensive and more available, this strategy will become even more common and widely used.

In the interim, clinicians may try to obtain objective information in place of direct observation. Some types of objective information are easier to obtain than others. Occupational and residential functioning can be examined with documents such as pay stubs, rent receipts, or utility bills. Social outcomes are more challenging to assess, not only because objective information may be harder to obtain but also because people have different definitions of good social outcomes, partly due to varying personality traits and cultures.

A caution with assessing functional milestones is that they do not necessarily overlap. A study[4] that examined the overlap between functional milestones found a correlation of 0.15 between patients with schizophrenia having been married and being financially responsible for their residence and a correlation of 0.18 between being employed and living independently. The skill sets for work, independent living, and marriage appear to be relatively independent of each other.[4] As a result, clinicians must remember that achievement in one milestone does not mean that other milestones have been obtained.

Structured Assessment Scales

Functional milestones are not the only way to index real-world functioning. Many aspects of everyday functioning that are important are performed in absence of achievement of full-scale milestones. As noted by Harvey and Bellack,[13] the achievement of functional milestones requires achievement of interim steps. For instance, in the domain of employment, preparing a resume, seeking a job, and going on interviews are critical preliminary steps that need to be accomplished prior to obtaining a job. There are multiple different rating scales, designed for both informant and patient reports, that have been used for rating of the everyday functioning in severe mental illness. The following several scales have shown evidence of good validity for high-contact clinician ratings.

Quality of Life Scale (QLS). The QLS[14] is a 21-item scale that assesses functioning in schizophrenia across 4 domains: intrapsychic foundations, interpersonal relations, instrumental role category, and common objects and activities. The interviewer rates the patient on a 7-point scale. Scores can be calculated for each subscale or for a total score ranging from 0 to 126 with higher scores indicating higher levels of functioning. Administered by a trained clinician as a semistructured interview, the QLS takes about 45 minutes to complete.[15]

Specific Levels of Functioning Scale (SLOF). The SLOF[16] is a 43-item questionnaire given in person to the case manager or caregiver of a patient with schizophrenia. The domains covered include interpersonal relationships, community activities, and work skills, and each domain is rated on a 5-point Likert scale.[15] Scores range from 43 to 215, and higher scores indicate better overall functioning.

Performance-Based Assessments

A solution to the problems with relying on patient and informant reports and obtaining objective information on milestone achievements is to use performance-based capacity measures, which are highly correlated with neuropsychological performance and often related to outcome.[17] Instead of conducting a detailed and complex neuropsychological assessment (which may not be readily available) to understand a patient's functional capacity, direct measurement of functional skills can achieve similar results. Abilities related to residential functioning, work, and social skills can be measured in tests that are structured, quantified, and performance-based.[18] Cognitive performance is related to functional outcomes, and patients with cognitive deficits may experience difficulties performing everyday activities.[18] Therefore, performance-based assessments can be used to evaluate the efficacy of medications so that clinicians can improve cognition and functional capacity in patients with schizophrenia.[12] The following validated assessment tools can help clinicians evaluate the cognitive and functional abilities of their patients with schizophrenia.

MATRICS Consensus Cognitive Battery. The purpose of the National Institute of Mental Health's Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) initiative was to develop a consensus battery to assess cognitive change in clinical trials.[19] Ten tests were chosen to represent 7 cognitive domains (Table 1).[19] The MATRICS Consensus Cognitive Battery meets the need for a reliable and valid assessment of cognitive functioning that is practical for multisite trials and may also help clinicians assess the effectiveness of cognitive remediation methods. The total testing time is estimated to be just over an hour, and the training required to administer the tests should take about a day.[19]

Schizophrenia Cognition Rating Scale (SCoRS). The SCoRS[20] was developed to assess the cognitive domains

Table 1. The MATRICS Consensus Cognitive Battery[a,b]

Speed of processing
Trail Making Test, Part A (1)
Brief Assessment of Cognition in Schizophrenia, symbol coding subtest (2)
Category fluency test, animal naming (8)
Working memory
Wechsler Memory Scale, 3rd ed, spatial span subtest (4)
Letter-Number Span test (5)
Reasoning and problem solving
Neuropsychological Assessment Battery, mazes subtest (6)
Verbal learning
Hopkins Verbal Learning Test—Revised, immediate recall (three learning trials only) (3)
Visual learning
Brief Visuospatial Memory Test—Revised (7)
Social cognition
Mayer-Salovey-Caruso Emotional Intelligence Test, managing emotions branch (9)
Attention/vigilance
Continuous Performance Test, Identical Pairs version (10)

[a]Based on Nuechterlein et al.[19]
[b]Numbers in parentheses indicate the recommended order of administration.
Abbreviation: MATRICS = Measurement and Treatment Research to Improve Cognition in Schizophrenia.

of attention, memory, reasoning and problem solving, working memory, language production, and motor skills. Each of the 18 items is rated on a 4-point scale during the interview. The SCoRS is administered by the clinician to the patient and to an informant, culminating in 3 different ratings (from the patient, informant, and clinician). Each interview takes about 12 minutes with an additional 1 to 2 minutes of scoring time. A global rating based on the 18 areas of cognition is rated from 1 to 10.[20]

The University of California, San Diego, Performance-Based Skills Assessment Battery (UPSA). The UPSA[21] was designed to measure performance in 5 domains of functioning: household chores, communication, finance, transportation, and planning recreational activities. Using standardized role-play situations, clinicians can administer the UPSA in about 30 minutes. The UPSA is a valid and reliable tool for assessing everyday function in mentally ill adults.[12]

A shortened version of the UPSA, the UPSA-Brief (UPSA-B),[22] consists of 2 subscales, communication and finance, from the original UPSA. The UPSA-B is highly correlated with the UPSA ($r = 0.91$), is sensitive to change, and takes only 10 to 15 minutes to administer. This test is also able to predict residential independence.

Social Skills Performance Assessment (SSPA). The SSPA[23] is a brief assessment tool of social competence in which the patient is rated on 2 standardized role-play scenarios, one requiring introduction to a stranger and the other requiring assertive behavior with a landlord. The SSPA takes about 12 minutes to complete both the role play and ratings.

Summary. Performance-based assessments can help clinicians measure patients' cognitive and functional abilities throughout treatment. They are less dependent on patient insight than self-reports, and they measure real-life functioning and impairments that may direct treatment targets.[12] One drawback is that the contrived environments may differ from real-life situations, but the direct measurement of functional skills can provide more insight into patients' abilities in less time than a detailed neuropsychological assessment.

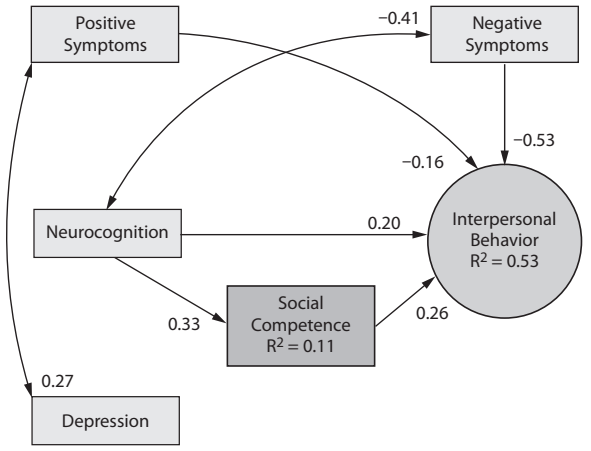
PREDICTORS OF REAL-WORLD FUNCTIONING

Research[3,24] indicates that cognitive impairments and negative symptoms are the most consistent predictors of disability. In a study[17] of 222 outpatients with schizophrenia, different factors predicted real-world behavior in work skills, interpersonal relationships, and community activities. All 3 areas were directly affected by social competence. For work skills, the independent symptomatic and cognitive predictors were depression, positive symptoms, processing speed, and attention/working memory. For interpersonal behavior, depression, negative symptoms, processing speed, and executive functioning predicted outcomes. Community activities, which include the ability to live independently, care for oneself, and pay bills, were directly influenced by positive symptoms and processing speed. Everyday living skills influenced community activities and work skills but not interpersonal behavior.[17]

A question arising from studies like the one by Bowie et al[17] is whether poor social outcomes are specifically related to negative symptoms. Several studies[5,6] have found that negative symptoms were strongly predictive of social dysfunction while cognitive deficits predicted other aspects of outcomes such as residential and vocational functioning. In a study by Leifker and colleagues,[25] social competence and cognitive function did not account for any variance in social outcomes when negative symptoms were included in the analysis, but 2 negative symptoms (blunted affect and social withdrawal) were the primary predictors of poor social outcomes. Another study by Bowie and colleagues[26] found that in patients with schizophrenia (N = 161), negative symptoms have a greater impact on interpersonal behavior than on residential and vocational outcomes (Figure 3).[26] While successful treatment of negative symptoms can lead to social gains, improvements in other aspects of everyday functioning may require improved cognitive function and social competence.

Cognitive deficits and negative symptoms respond differently to treatment. For example, cognitive remediation therapy, which improves cognitive performance, has been shown (in combination with functional skills training) to improve work skills and community/household activities but to have little impact on negative symptoms and inconsistent impact on social outcomes.[27] Similarly, pharmacologic agents may have differential effects on cognition and negative symptoms, with potentially different effects on downstream functioning (residential and vocational vs social). To date, pharmacologic agents that improve negative symptoms have yielded little to no positive impact on cognitive measures,

Figure 3. Prediction of Interpersonal Behavior in Schizophrenia (N = 161)[a]



[a]Adapted with permission from Bowie et al.[26]

although this finding could be due to the specific properties of the drugs tested.[28]

CONCLUSION

Functional impairment is common in patients with schizophrenia, affecting areas such as employment, relationships, self-care, independent living, and perceived quality of life and illness burden. Assessment of real-world functioning requires collecting information from multiple sources including patients, informants (such as relatives and case workers) who have frequent contact with the patient, objective information sources, or direct observation. Because patient and family reports do not always reflect patients' true functioning, clinicians should also incorporate performance-based assessments to gauge treatment efficacy and functional improvement. Functional milestones in work, independent living, and stable relationships are not highly related and require separate assessments. Many validated assessment tools are available to measure neurocognition and real-life skills through interviews, surveys, and role-play scenarios. Cognitive deficits and negative symptoms are both predictors of functioning, but they should be viewed as separate symptom sets requiring different interventions. Disability may need to be treated domain by domain with different strategies. A patient with a job may not need employment skills but may need help developing social skills or self-management skills. Recovery across functional domains is not guaranteed by the absence of either negative symptoms or cognitive impairments. Disability in schizophrenia requires a holistic approach that considers multiple features of the illness in terms of predicting and overcoming disability.

Disclosure of off-label usage: Dr Harvey has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents that is outside US Food and Drug Administration–approved labeling has been presented in this activity.

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