

Development of Outcome Indicators for Monitoring the Quality of Public Mental Health Care

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Objective: The study attempted to develop a brief and integrated set of reliable and valid outcome measures that could be used by both consumers and providers to assess the quality of public mental health care. **Methods:** A model of outcomes in four domains—consumer satisfaction, functioning, quality of life, and clinical status—was developed from the literature and from the priorities expressed by members of an advisory group of stakeholders. Based largely on extant measures, a consumer survey and a case manager survey were then created to assess these domains. A total of 236 adult consumers of mental health services from six community mental health centers in Washington State were surveyed. The four-item case manager survey to rate consumers' clinical status was completed by 163 of the participants' case managers. Scores and ratings on the survey were analyzed using correlational analysis and principal components analysis to determine whether the data provided empirical support for the four-domain model. **Results:** Principal components analysis demonstrated support for the four-domain model. Internal consistency of the outcome indicators was adequate, and their concurrent validity was partly supported. **Conclusions:** The described outcome measures provide a practical, empirically supported structure for monitoring and improving public mental health services. (*Psychiatric Services* 48: 903–909, 1997)

The quality of health and mental health care services has traditionally been defined on the basis of setting structure, service processes, and consumer outcome variables (1–8). Outcomes are assessed and monitored more rarely than

structure or process indicators because their measurement is considered to be costly and temporally removed from the point of service (4). However, outcomes are a much more direct indicator of quality than either structure or process indicators.

The interplay between structure, process, and outcome variables is highlighted in the area of continuous quality improvement, in which improvement of poor outcomes occurs through understanding system processes and structure (9–11). Outcome monitoring and continuous quality improvement have a heightened role within emerging managed care systems that may drive down costs and consequently put quality at risk.

Despite the importance of outcome monitoring, limited work has been done toward developing outcome assessment systems. Such systems have two components—a set of outcome assessment tools and a series of implementation mechanisms, including methods for sampling and data collection, analyzing and monitoring data, and providing feedback to stakeholders. This paper focuses on the first component, that of developing a comprehensive yet practical outcome assessment package to gather data on specific outcome indicators.

Outcome measures typically assess specific domains in detail—for example, a person's functioning, symptoms, and quality of life. However, when multiple domains must be assessed, the tools become too long and impractical. Agency administrators require brief user-friendly outcome measures that can be used

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repeatedly over time to monitor program quality (4). Key outcomes must also be assessed by both service providers and consumers. A brief integrated package of outcome assessment tools that can be used by different raters to assess multiple domains has not been described. In the next section we introduce the conceptual framework for outcome domains on which measurement selection and outcome indicators are based. The remainder of the paper describes the reliability and validity tests of the indicators.

Outcome priorities

To choose an appropriate set of outcomes, the consensus of "customers" is required (4). However, gaining consensus about the most important outcomes to measure and how to measure them has been a challenge to the field, and no "gold standard" exists. Stakeholder groups, including mental health consumers, family members, providers, and administrators, often debate what service goals and outcome priorities should be (12; McGuirk F, Zahniser J, Bartsch D, et al., unpublished data, 1995).

Examination of frameworks that encompass the outcome priorities of many stakeholders (13–16) reveals four outcome domains: satisfaction, functional status, quality of life, and clinical status. These domains are conceptually supported by research reviewed below and by input from a stakeholder advisory committee established for this study, which was composed of consumers, family members, providers, administrators, and funders.

Stakeholder groups are all concerned about satisfaction with services (17; McGuirk F, Zahniser J, Bartsch D, et al., unpublished data, 1995). Important dimensions are general satisfaction, whether services meet stated needs, service context variables (accessibility, safety, friendliness, and facility environment), and appropriateness of services to persons with certain socio-demographic characteristics. Other key outcomes include whether consumers are involved in and influence service decisions (18–21).

Measures of functioning generally

assess consumers' social and vocational role performance and their ability to perform activities of daily living. Service providers and administrators prioritize appropriate vocational and leisure activities (22), while researchers and administrators view positive interpersonal functioning as an important outcome (23). Consumers have stressed the value of social support and a sense of belonging (24,25).

In the area of quality of life, both consumers and family members have identified adequate housing, employment or other meaningful activity, and sufficient finances as important outcomes (24–28). Safety issues, including prevention of victimization and harm to others, are also important (29–32). Quality of life can in part be viewed as the degree to which consumers are satisfied with their housing, activities, finances, and safety (21,23,33).

Researchers and service administrators are concerned with improved symptoms (24,32), knowledge of illness (31), and emotional well-being (29). Self-management of illness, including compliance with treatment and medication, are also viewed as important issues by providers and administrators (26,32).

One of the most commonly reported outcomes for mental health care consumers is community tenure (23,31,34,35). However, stakeholders do not agree about whether out-of-community care, such as hospitalization, is a positive or negative outcome (30). Furthermore, episodes in institutions can be seen more as indicators of service responsiveness rather than as measures of consumer outcome. We have therefore chosen not to include community tenure as an outcome. Instead it was used as a general index against which the concurrent validity of our selected outcomes was evaluated.

Overall, the literature about the outcome priorities of various stakeholders supports a four-domain model of consumer outcomes. In the study reported here, empirical support for this model was provided through principal components analysis of surveys assessing these domains that were completed by 236

consumers and 163 of their case managers in Washington State.

Methods

Measures

Selection of measures was based on psychometric adequacy, brevity, ease of administration, and comprehensibility of items. Measures were reviewed by the study advisory committee and pilot tested by members of a consumer advisory committee. The surveys were completed in May and June 1995.

Consumer surveys. Consumer surveys included the eight-item Client Satisfaction Questionnaire (CSQ) (36) and the SF-12 (37,38). Seven items about residential arrangements, social and leisure functioning, family interactions, and safety were included from the Lehman Quality of Life Interview (39). Three items were developed to assess consumer involvement in treatment—that is, the extent to which consumers feel they are part of decision making and planning—and two items assessed appropriateness of treatment for age and for ethnic and cultural background.

Four additional items from a California public mental health survey (40) assessed whether consumers' work and education goals were attained. Four items assessed consumers' self-reported skills in handling stress and symptoms. Two items assessed whether consumers had been a victim of a crime in the past 12 months, and two items assessed concerns about their living condition.

Case manager surveys. Surveys were sent directly to the case managers. Case managers completed items about consumers' community tenure (including admissions to psychiatric and medical hospitals and jail episodes). They also completed the Four-Dimensional Classification Scale (41), which includes four single-item 7-point scales that assess symptoms, functioning, substance abuse, and treatment compliance.

Information systems. Regional management information systems were the source of sociodemographic data for the participants as well as information about their residential situations and daily activities.

Participants

A total of 236 consumers of mental health services were recruited by surveyors (see below) from six community mental health centers in two regions of Washington state. The regions encompass rural, suburban, and small urban centers. Regions were selected as part of a larger study evaluating the impact of replacing process regulations with clinical outcomes as a method of accountability.

Sixty percent of the sample were women. Ninety-one percent were Caucasian. The mean \pm SD age was 47.9 ± 18.2 years. The incomes of most participants (79 percent) were below the poverty level, and most participants (89 percent) received Medicaid-funded services.

Eight percent of the participants were involved in paid work or in school. Most lived in their own residence or with parents (79 percent), while the remainder lived in supported housing or nursing homes. Diagnostic categories included schizophrenia (31 percent), major depression (18 percent), bipolar disorder (13 percent), dysthymia and minor depression (9 percent), adjustment disorder (6 percent), and dementia (3 percent).

The sample was representative of the region's mental health consumer population in gender, ethnicity, income, and residential situation. However, study participants were older, less likely to have meaningful daily activity, and more likely to have schizophrenia. Even though all study participants had case managers, case manager compliance was imperfect. Case manager surveys for only 163 of the participants were completed. Participants whose case managers completed the survey were younger than the full sample ($t=5.1$, $df=108$, $p<.001$), but they did not differ in ethnicity, gender, involvement in meaningful daily activity, or diagnostic mix.

Consumer data collection

Consumers from service delivery systems adjacent to the study regions were hired as surveyors to facilitate self-administration of consumer surveys. Surveyors recruited consumers at agencies as they came in for ap-

Table 1

Mean scores of 236 mental health consumers on a survey measuring satisfaction, functioning, and quality of life and mean ratings of consumers' clinical status by 163 of their case managers

Domain and measure	Number of items in measure	Mean	SD	Possible score range
Satisfaction				
Client Satisfaction Questionnaire	8	3.29	.61	1-4
Involvement in treatment	3	3.98	1.03	1-5
Treatment appropriateness	2	3.98	1.07	1-5
Safety at the mental health center	1	.89	.32	0-1
Functioning				
Physical ¹	6	10.04	.74	—
Mental ¹	6	10.03	.66	—
Social and leisure	3	4.74	1.28	1-7
Skills for handling stress and symptoms	4	3.54	.87	1-5
Quality of life				
Safety	4	4.89	1.30	1-7
Concerns about living condition	2	.60	.38	0-1
Goal attainment	4	.73	.18	0-1
Victimization	2	1.82	.31	1-2
Clinical status				
Four-Dimensional Classification Scale	4	4.14	1.05	0-6

¹ Because items from the SF-12 used to measure these constructs are rated on different scales, the standardized scale scores are shown.

pointments and on outreach appointments with case managers. Participants were generally able to complete the survey with little difficulty in 15 to 20 minutes.

Data analyses

The analyses described below first examined within-domain and between-domain correlations of the 13 scales in the four domains. A correlation matrix was created based on consumers' scores and case managers' ratings from the surveys. A principal components analysis was then conducted to determine whether the four domains could be empirically derived from the data in the correlation matrix. Finally, the 13 domain scales derived from the principal components analysis were tested for reliability and validity.

Results

Table 1 lists the 13 scales in the four domains that were examined in the surveys completed by consumers and case managers. (A copy of the full instrument is available from the first author.) The mean score or rating for each measure is reported, as are the number of items in each measure and the range of possible scores for each measure. Table 2 presents a

correlation matrix showing the correlations between the measures listed in Table 1.

Correlations of scales

Measures within a domain should correlate more highly with each other than with measures from other domains, which was borne out in the analysis. Within-domain correlations for satisfaction and functioning were moderately strong, indicating that the individual measures in each domain are related but also that each contributes some unique variance to the domain. For example, the intercorrelations of the measures related to satisfaction ranged from .24 to .58, and all were statistically significant ($r>.18$).

Most between-domain correlations were nonsignificant and lower than the within-domain correlations. For example, the functioning domain was distinct from the satisfaction domain, with no statistically significant correlations. Quality of life was partly related to both functioning (four significant correlations) and satisfaction (five significant correlations). The clinical domain was more distinct from the other domains, with only one significant correlation.

Table 2

Correlation matrix of data for 13 outcome measures in four domains obtained from a survey of 236 consumers and 163 case managers¹

Domain and measure, with Cronbach's alpha ²	Satisfaction				Functioning				Quality of life			
	1	2	3	4	5	6	7	8	9	10	11	12
Satisfaction												
1. Client Satisfaction Questionnaire (.91)												
2. Involvement in treatment (.41)	.51											
3. Treatment appropriateness (.70)	.58	.39										
4. Safety at the mental health center	.46	.24	.33									
Functioning												
5. Physical (.80)	.05	.02	.00	-.05								
6. Mental (.77)	.17	-.02	.14	.16	.42							
7. Social and leisure (.64)	.21	.04	.10	.13	.17	.47						
8. Skills for handling stress and symptoms (.76)	.13	.05	-.02	.10	.33	.60	.42					
Quality of life												
9. Safety (.82)	.23	.10	.16	.30	.10	.20	.30	.16				
10. Concerns about living condition (.34)	.01	.03	-.10	.02	.05	.07	.14	.00	.27			
11. Goal attainment (.48)	.01	-.11	.06	-.01	-.11	.18	.14	.02	-.08	.25		
12. Victimization (.42)	.20	.07	.21	.25	-.05	.20	.22	.08	.26	.15	.20	
Clinical status												
13. Four-Dimensional Classification Scale (.61)	.15	.13	.30	.18	-.05	.03	.04	.06	.13	.10	.10	.14

¹ Correlations above .18 were significant at $p < .05$. Data on some items were missing for some consumers.

² Cronbach's alpha reflects the internal reliability of each measure (safety at the mental health center was measured by a single item and has no alpha).

Principal components analysis

Domains were derived from the principal components analysis based on a combination of eigenvalues greater than 1, relatively large eigenvectors or component loadings, and judgments about theory and interpret-

tive clarity. The results are shown in Table 3. They were not surprising given the data in the correlation matrix, and they supported the four conceptually derived domains.

The satisfaction component included the CSQ and items about treat-

ment involvement, appropriateness, and safety at the mental health center. This component accounted for 23 percent of the overall variance in consumers' scores on the survey; it had an eigenvalue of 3.01.

The functioning component included the SF-12 and items assessing social and leisure functioning and skills. This component accounted for 16 percent of the score variance and had an eigenvalue of 2.02. The quality-of-life component included items on safety, concerns about living condition, goal attainment, and victimization. This component had an eigenvalue of 1.47, accounting for 11 percent of the variance. The clinical status domain, measured by the four-item Four-Dimensional Classification Scale, had an eigenvalue of .94 and accounted for 7 percent of the variance.

Scale loadings on the satisfaction component were clearly distinct from other components. One measure from the functioning domain—social and leisure functioning—and one from the quality-of-life domain—safety—loaded higher on the satisfaction domain than on their respective domains. However, these measures were not included in the satisfaction domain because it made more interpretive sense to include them in their

Table 3

Principal components analysis of 13 outcome measures, with component loadings on four outcome domains

Domain and measure	Component loadings ¹			
	Satisfaction (3.01)	Functioning (2.02)	Quality of life (1.47)	Clinical status (.94)
Satisfaction				
Client Satisfaction Questionnaire	.40	-.30	-.16	.06
Involvement in treatment	.35	-.34	-.23	-.03
Treatment appropriateness	.33	-.36	-.09	.16
Safety at the mental health center	.33	-.23	.01	-.13
Functioning				
Physical	.15	.35	-.35	-.09
Mental	.34	.42	-.10	.21
Social and leisure	.33	.30	.05	.01
Skills for handling stress and symptoms	.28	.40	-.22	.12
Quality of life				
Safety	.31	.03	.14	-.62
Concerns about living condition	.11	.12	.50	-.38
Goal attainment	.08	.11	.53	.54
Victimization	.27	-.03	.37	.01
Clinical status				
Four-Dimensional Classification Scale	.19	-.18	.20	.31

¹ Eigenvalues are in parentheses below each domain.

Table 4

Concurrent validity of four outcome domains demonstrated by their associations with three community-valued outcome indicators

Domain	Meaningful activity						Living situation						Out-of-commu- nity episodes ¹					
	None (N=112)		Any (N=89)				Dependent (N=49)		Independent (N=159)				Any (N=13)		None (N=51)			
	Mean	SD	Mean	SD	t	df	Mean	SD	Mean	SD	t	df	Mean	SD	Mean	SD	t	df ²
Satisfaction	9.92	.80	10.10	.68	1.69	198	9.92	.86	10.01	.71	.82	203	10.60	.73	10.60	.69	.01	62
Functioning	9.96	.70	10.05	.55	.97	198	10.18	.67	9.95	.62	-2.18*	203	10.10	1.03	9.8	.82	-1.34*	61
Quality of life	9.88	.67	10.07	.59	1.99*	198	10.04	.65	9.94	.63	-.88	205	9.9	.67	9.8	.86	-.58	65
Clinical status	3.71	1.11	4.42	.95	3.90**	131	3.57	1.30	4.15	1.01	2.45*	134	3.2	1.09	4.2	.66	3.32**	14

¹ Admissions to psychiatric and medical hospitals and jail episodes

² The df value for clinical status (df=14) was estimated from samples with unequal variances.

*p<.05

**p<.01

respective domains. Likewise, goal attainment was included in the quality-of-life domain for interpretive reasons, even though it also loaded on the clinical status domain.

Outcome indicator scores and reliability

Outcome indicators were calculated as mean scores within each of the four domains derived from the principal components analysis—satisfaction, functioning, quality of life, and clinical status. Outcome indicators were scored so that positive values indicated more favorable status. Scores for the domains of satisfaction, functioning, and quality of life were standardized for comparison around a mean of 10 and a standard deviation of 1.

For satisfaction, the mean±SD score for the sample of 236 participants was 9.94±.70; the internal reliability of the measures in this domain was high (Cronbach's alpha=.88). For functioning, the sample mean was 10.06±.74 (Cronbach's alpha=.85). For quality of life, the mean score was 9.93±.80 (Cronbach's alpha=.70). For clinical status, the mean rating was 4.15±1.05 (Cronbach's alpha=.61). The alpha values indicate that reliability was adequate.

Concurrent validity

Because no standard exists by which to determine the concurrent validity of outcome indicators (that is, whether they measure what they claim to measure), we believe the key

is to determine their relationship to more distal community-valued indicators, such as involvement in meaningful daily activity, residential independence, and community tenure. Meaningful activity was defined as involvement in any activity that was age appropriate and not treatment related. Residential independence was defined as residing in a stable location that was not linked with treatment or not a correctional facility. Community tenure was defined as the absence of a psychiatric or medical hospitalization or jail episode within the previous six months.

Parametric t tests were used to compare outcome indicators with distal indicator values. Two-tailed p values were set at <.05. As shown in Table 4, clinical status was significantly lower for participants without meaningful daily activity, those in dependent living situations, and those who had experienced an out-of-community episode. The relationship of consumer-reported satisfaction, functioning, and quality of life to validity indicators was more inconsistent. It is likely that residential situation, community tenure, and work involvement are strongly influenced by clinicians' decisions and their judgments about clinical status. A strong relationship, therefore, may not be as likely for the other outcome indicators, which are rated by consumers. Further, an anomaly of the data was that consumers living with their parents were considered to be "independent."

Discussion

This study described the development of and empirical support for a set of practical yet comprehensive outcome indicators. Four outcome domains were identified from a theoretical framework, which was supported by stakeholder input. Brief measures, largely compiled from extant scales, adequately captured the content of each outcome domain: clinical status (four items), functioning (19 items), consumer satisfaction (14 items), and quality of life (12 items). Easily administered consumer and case manager surveys were developed.

The conceptually derived domains were empirically supported by the principal components analysis. Outcome indicators for each domain were found to have adequate internal consistency, and concurrent validity of the clinical status domain was supported. Researchers often feel torn between concerns for psychometric adequacy and administrative needs for very brief assessment tools. The results of this study are encouraging because they suggest that it is possible to have both.

The outcome indicators in this study lie within a growing body of work on outcomes and quality monitoring. Compendiums of outcome measures are popular, and methods for performance-based contracting and for designing provider "report cards" have been topics of recent industry conferences (43–45). Meas-

urement packages that assess relevant domains and that can be used by different raters (45–47) and separate consumer or clinician-rated measures (48,49) are also available. However, these tools are considerably longer than those described in this paper, and thus respondent burden is increased. Some are also proprietary (45), making cost an additional consideration. Although each package and measure has strengths, we believe that the set of measures described in this study provides a unique combination of advantages in terms of brevity, cost, ease of administration, and psychometric promise.

Using outcome data

Discussion in this section focuses on use of the four outcome indicator scores shown in Table 2. However, one could also use raw individual scale scores (see Table 1) in similar ways.

It is important to recognize that the consumer population served in the public mental health system is clinically heterogeneous. Consumers' presenting problems range from mild anxiety to severe and persistent mental illness. The initial severity of illness is related to both the level of expected outcomes and the rate at which outcomes can be achieved. As such, it is critical to identify case-mix groups or risk groups that have similar expected outcomes.

Without such adjustment of expected outcome measures, providers may attempt through "skimming" or "dumping" to attract and serve consumers for whom positive outcomes are easier to achieve, particularly if providers' performance evaluation is tied to achievement of outcomes. Case-mix adjustment methods may be especially useful for capitated financing plans, in which both capitation rates and expected outcomes may be based on case-mix groups.

Stakeholder groups often have different uses for outcome data. For example, funders may want to use outcome indicators as the basis for contracting and accountability. Mean scores on the satisfaction indicator would be useful for this purpose. Risk-adjusted change in functioning or clinical status over a given period

of time would also provide useful information. Fiscal incentives could then be based on the provider's performance relative to other providers or relative to that provider's previous performance. The choice of incentive structures is critical to the success of such an accountability system. Once an incentive structure is imposed, service providers will work toward obtaining the selected incentives, and other outcome goals may be compromised.

Service providers may want to use outcome indicators for quality improvement. They may, for example, be interested in examining risk-adjusted outcomes for different clinicians. Satisfaction ratings can be used to identify areas within a provider agency that may warrant further study for development of quality improvement projects. Consumers with scores at the extremes on any indicator can also be identified for the purpose of more intensive investigation, further clinical supervision of staff, or advocacy on behalf of the consumer.

Study limitations

A limitation of the study is that the outcome indicators are relevant only to consumers already receiving mental health services. Stakeholders are also interested in understanding outcomes of consumers who may be in need of services but do not receive services or who prematurely terminate services (27). Another limitation of the study was use of data from management information systems to determine concurrent validity. As discussed, certain variables, such as independent living, were defined in ways that hampered clear-cut conclusions.

Conclusions

This paper describes the development of outcome indicators related to consumer characteristics. Future research may expand this study into the area of indicators of system performance, such as service accessibility and responsiveness, staff satisfaction, and cost-efficiency.

Cultural differences in outcome indicators are another potentially fruitful area for research. Although some

scales described here have been used with a variety of ethnic groups, their validity in capturing issues relevant to specific groups has yet to be established. Even if scales demonstrate such content validity, their relationship to distal community-valued variables may vary across groups. Research in this area might suggest adjustments of normative values for outcome indicators for different groups in a manner analogous to risk adjustment.

Overall, the outcome indicators discussed in this study provide a practical structure for mental health quality monitoring and improvement. Outcome indicators can be especially useful for mental health programs embarking on managed care where incentives may exist for decreasing service—and potentially service quality—in favor of cost savings. The outcome indicators discussed, based on stakeholder priorities, are assessed in a package that is brief, yet provides a rich array of information. As such, this set of empirically supported outcome indicators can serve as a critical and timely component of quality management in mental health care. ♦

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