Quality of Life Assessments by Adult Substance Abusers Receiving Publicly Funded Treatment in Massachusetts

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ABSTRACT

Purpose. Quality of life (QOL) has become an important endpoint in clinical trials and studies of medical interventions for many chronic diseases, but has not been widely studied in the substance abuse field. The purpose of this study was to measure QOL in a large sample of adult substance abusers (SA), to compare QOL ratings with those for other chronic diseases, and to assess factors influencing QOL levels in this population.

Methods. Hour-long personal interviews were administered to 570 randomly selected substance abuse clients in six detoxification centers and seven outpatient facilities in Massachusetts. Two QOL instruments—the Multidimensional Index of Life Quality (MILQ) and the SF-12—were used to measure QOL. Substance use problems were measured by the Addiction Severity Index Drug and Alcohol composite scores. QOL scores were compared to those for patients...
with other chronic diseases. Multivariable regression analysis was used to estimate the influence of demographic characteristics, co-morbidities, and substance use on QOL summary scores.

Results. SA clients reported significantly lower QOL scores than patients about to undergo heart surgery on seven of the nine MILQ domains as well as the MILQ QOL summary index. SA clients also had much lower mean scores than the general population on both the SF-12’s Mental Health (ES = −1.80) and Physical Health (ES = −0.58) component scales. SF-12 physical component scores were similar to those for other chronic diseases, but mental component scores were markedly lower and comparable on average to clinically depressed groups. In the regression model, MILQ Index scores were significantly lower for dual diagnosis and detoxification cases. Index scores were negatively associated with ASI drug composite scores, but not with ASI alcohol scores.

Implications. The results of this study suggest that the physical functioning of adult substance abusers is similar to the levels for patients diagnosed with other serious chronic diseases, but that mental functioning is much lower. QOL provides information about functioning and well-being that is not captured by traditional measures of substance use, and may soon begin to play a more prominent role in evaluating the effectiveness of treatment services for substance abusers.

Key Words: Quality of life; Substance abuse; Well-being; Mental functioning; Physical functioning.

INTRODUCTION

Quality of life (QOL) has become an important endpoint in many studies of medical and surgical interventions. When first developed, QOL measures were most commonly used in studies of chronic diseases with high mortality rates, such as cancer and AIDS. More recently, applications have expanded to include non-fatal medical conditions and mental disorders (1).

To date, comparatively little work has examined the QOL of people treated for substance abuse (SA). The conventional outcomes for substance abusers continue to be measures of the frequency and quantity of the use of alcohol, cocaine, heroin, and other drugs. However, there are several reasons to believe that QOL could be an especially valuable tool in SA research and evaluation. First, most QOL measures involve two primary dimensions—physical functioning and mental functioning (2). Both dimensions are relevant to SA. Some evidence suggests that mental disorders, particularly mood
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disorders, have a greater impact on QOL than common medical conditions (3,4). Second, because of its emphasis on these two broad areas of functioning, QOL provides a broader, more global context for evaluating treatment effects than usage data alone. Third, there is increasing evidence that QOL is of prognostic value in treatment settings. Pretreatment QOL has been found to predict service utilization and subsequent psychiatric status independently of demographic characteristics, baseline status, and diagnostic group (5). In addition, QOL may also influence the decision to remain in treatment.

Using data from a sample of adults seeking treatment for substance abuse disorders in the Massachusetts Managed Care Study, the objectives of this study were to (1) compare QOL assessments made by substance abusers to those for other chronic diseases, (2) to determine the factors influencing QOL ratings, and (3) to explore the relationship between QOL and traditional measures of substance use.

METHODS

Sampling Procedures

Sampling procedures were designed to provide a representative sample of clients receiving publicly funded treatment for substance abuse disorders throughout Massachusetts in 1997. Study participants were identified through a multistage sampling design. The sampling frame consisted of 27 ATS (acute treatment services or detoxification) facilities and 37 outpatient facilities. Facilities were eligible for the study if they had a minimum of 16 annual Medicaid admissions paid for by either managed care vendors or by fee-for-service. Methadone programs and facilities serving only special populations (youth, seniors, criminal offenders) were not eligible. The facility frame was stratified by geographic region and the provision of ATS and outpatient services.

In the first stage, individual facilities were randomly selected from the frame strata. The three largest sites in the state were selected with certainty. Eleven other facilities were selected with probabilities proportional to the number of annual Medicaid admissions they had in fiscal year 1996. In the second stage, clients were randomly selected from each sampled facility. Clients were eligible to participate if they were Massachusetts residents aged 18–64 years, spoke English or Spanish, and were enrolled in Medicaid or had Department of Public Health (DPH) contract coverage for the uninsured. Different recruitment methods were used in the ATS and outpatient sites. New admissions to ATS facilities were screened for eligibility each week by program staff, sampled at different rates according to insurance coverage, and
recruited during their stay. In outpatient facilities, new admissions and clients on the existing caseload were identified by site liaisons who extended invitations to participate either by telephone or prior to scheduled counseling visits. Recruitment took place from 4 to 23 consecutive weeks at individual sites.

Structured, in-person interviews were conducted by trained Institute interviewers in private rooms at each facility. The interviews followed a common protocol for a multisite cooperative agreement that was adapted for Massachusetts. Respondents signed an informed consent before the interview. All recruitment, contact, and interview procedures were approved by the Institute’s Institutional Review Board and research committees within the state. The study was also granted a federal Certificate of Confidentiality for the protection of research subjects.

**Measures**

The survey instrument contained a broad array of demographic, health status, treatment, and substance use variables. Substance use was measured by the Addiction Severity Index [ASI; (6)]. The alcohol composite and drug composite scores from this instrument are based on frequency of use in the previous 30 days, ratings of troublesomeness, and assessments of need for treatment. ASI composite scores have previously been shown to be highly correlated with clinical staff assessments of need for treatment (6). Composite scores may range from 0 to 1 with higher scores indicating greater severity.

Two quality of life instruments were used in the study. The SF-12 (7) is a 12-item version of the Short Form-36, the most frequently cited quality of life measure in the literature (8). The SF-12 contains at least one item from each of the eight scales composing the SF-36 (physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health). Item responses are weighted and combined to produce a Physical Health Component Summary score (PCS-12) and a Mental Health Component Summary (MCS-12). Two-week test-retest reliabilities in a general population were 0.89 for the PCS-12 and 0.76 for the MCS-12. Like the SF-36, SF-12 scores are normed so that each score has a mean of 50 and standard deviation of 10 in the general U.S. population.

The Multidimensional Index of Life Quality (MILQ) is a 35-item measure that provides scores for nine individual life domains (mental health, physical health, physical functioning, cognitive functioning, social functioning, intimacy, productivity, financial status, and relationship with health professionals) (9). These domains were identified from focus group discussions
with patients at cardiovascular disease clinics. Cronbach’s alpha was 0.76 or higher for each domain except social functioning, and test-retest reliabilities ranged from 0.62 to 0.84. The MILQ also provides a single summary index for overall QOL that is a weighted combination of the physical functioning and mental health domain scores.

Because they have been used so widely, SF-12 component scores can be compared to a variety of chronic diseases and health conditions. The MILQ provides scores for physical functioning and mental health as well as seven other domains that are important in patients’ lives but that are not captured by the brief SF-12. Moreover, the MILQ is one of the few instruments that has an algorithm for computing an overall QOL summary score.

The project did not have access to facility medical records. Dual-diagnosis status (a diagnosed mental disorder in addition to a substance abuse disorder) was therefore operationalized by any self-reported overnight hospital stays for psychological or emotional problems in the 6 months before the interview. Respondents indicated whether a doctor had ever told them they had any of six major comorbid conditions (lung problems, asthma, heart problems, stomach ulcers, arthritis, and neurological problems). These comorbidities have previously been shown to have a significant impact on physical and mental functioning (10).

Statistical Analyses

Results reported in this article are weighted to reflect the multistage sampling design. The total weight is the product of separate weights for the probability that the facility was selected, the probability that a client was selected from the facility, and a poststratification weight that balances the sample with respect to statewide admissions by insurance group.

QOL scores in this sample were compared with the results reported in other studies. The magnitudes of group differences were summarized by effect sizes [difference between group means divided by standard deviation; (11)]. Multiple regression analysis, estimated by ordinary least squares, was used to determine the effects of selected factors on MILQ Index scores.

RESULTS

Sample Characteristics

Thirteen facilities (six ATS and seven outpatient) participated in the study. Two randomly selected sites declined to participate, and one additional
facility was added to replace them. Personal interviews were successfully completed with 409 ATS clients and 161 outpatients.

Descriptive statistics are shown separately for SA detox clients and outpatients in Table 1. Overall, women composed one-third of the sample, and one-third were members of minority groups. Heroin use was self-reported as the primary problem drug by half of the detox clients, whereas alcohol was the most common problem drug reported by outpatients. Eleven percent of the sample was classified as dual-diagnosis cases. The detox group had considerably higher ASI composite scores than the outpatients, and lower scores on the MILQ Index and SF-12 scales.

**MILQ Comparisons**

The MILQ was previously administered to a sample of 132 patients during the week before they underwent cardiac surgery (coronary artery bypass grafts or percutaneous transluminal coronary angioplasty) (12). Table 2 compares

| Table 1. Descriptive statistics for Massachusetts detoxification clients and outpatients receiving publicly-funded treatment for substance abuse disorders, 1997–98. |
|---|---|
| | Detox (n = 409)<sup>a</sup> | Outpatient (n = 161)<sup>a</sup> |
| Female (%) | 29.2 | 42.9 |
| African American (%) | 18.7 | 21.1 |
| Hispanic (%) | 18.2 | 8.6 |
| Education (yr) | 11.8 (2.3) | 12.0 (2.4) |
| Age (yr) | 34.2 (8.5) | 36.9 (8.5) |
| Mental health hospitalization (%) previous 6 months | 8.9 | 15.0 |
| Heroin primary drug (%) | 50.6 | 14.1 |
| Alcohol primary drug (%) | 22.1 | 42.6 |
| ASI alcohol composite | .396 (.341) | .159 (.241) |
| ASI drug composite | .296 (.167) | .057 (.089) |
| MILQ Index score | 47.8 (15.8) | 52.0 (16.5) |
| SF-12 physical component | 42.7 (9.4) | 47.8 (11.7) |
| SF-12 mental component | 30.6 (10.2) | 35.7 (11.7) |

Numbers in parentheses are standard deviations.

ASI = Addiction Severity Index; MILQ = Multidimensional Index of Life Quality.

<sup>a</sup>Unweighted sample size; descriptive statistics are weighted.
these surgical patients to the SA outpatient and detoxification samples on each of the nine MILQ domains and the summary index. The score profiles for the two SA groups were very similar to one another, and significantly lower than the CVD surgery sample on all but two of the scales. The SA groups had markedly poorer scores on the financial status domain. The QOL summary score, the MILQ Index, was also significantly lower for the detoxification group (47.8) and the outpatient group (52.0) than for the surgery group (59.0). Translated into effect sizes, these represent medium to large differences from the surgery group mean (effect sizes of –.86 and –.54, respectively.

### SF-12 Component Score Comparisons

SF-12 scores are normed as T-scores (mean = 50, Standard Deviation[SD] = 10) for the general population. The mean MCS-12 and PCS-12 scores in the SA sample were 35.7 (SD = 11.7) and 47.8 (SD = 11.7) respectively for the outpatients, and 30.6 (SD = 10.2) and 42.7 (SD = 9.4) respectively for the detoxification clients.
for the detox clients. These scores are lower than the population norms, with
effect sizes ranging from $-0.22$ for the outpatient PCS score to $-1.94$ for the
detox group’s MCS score. Figure 1 displays SF-12 PCS and MCS scores for the
two SA groups, and for seven self-reported chronic diseases and conditions in
the National Survey of Functional Health Status (10). SA outpatients had
comparatively high PCS scores, whereas the PCS scores for detox clients were
similar to patients with arthritis or lung diseases. MCS scores, on the other hand,
were markedly lower for the SA clients than for adults with any other chronic
health problem. The MCS score for the depression group in the graph is based
on self-reported depression in the general population. The MCS score for
clinically diagnosed depression among primary care patients in the Medical
Outcomes study was lower than this [MCS = 34.8; (10)].

![Figure 1. SF-36 Physical Health Component Summary (PCS) and Mental Health Component Summary (MCS) for substance abuse detoxification clients, substance abuse outpatients, and other selected conditions.](image-url)
To assess the impact of substance use status on overall QOL, we used the MILQ Index as a summary measure of QOL. The MILQ Index combines the two most important QOL domains, mental functioning and physical functioning, into a single score. No comparable overall score is available for the SF-12 or SF-36. In fact, the SF-12 scoring algorithms force MCS and PCS scores to be uncorrelated with one another in spite of substantial evidence that these two domains are in fact highly correlated in both general population and patient samples (13).

Of primary interest in this analysis is the effect of ASI scores, detox vs. outpatient status, and mental hospitalization in the past 6 months (as a surrogate for dual diagnosis cases) on QOL levels. The regression model controls for demographic characteristics and the impact of six chronic health conditions.

### Table 3. Multiple regression analysis estimates for MILQ index.

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Unstandardized coefficient</th>
<th>Standard error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>−0.33**</td>
<td>0.08</td>
</tr>
<tr>
<td>Female</td>
<td>−1.45</td>
<td>1.37</td>
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<tr>
<td>African American</td>
<td>3.24</td>
<td>1.67</td>
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<tr>
<td>Hispanic</td>
<td>−0.49</td>
<td>2.07</td>
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<td>Education (yrs)</td>
<td>−0.02</td>
<td>0.28</td>
</tr>
<tr>
<td>Heart disease</td>
<td>0.61</td>
<td>2.05</td>
</tr>
<tr>
<td>Neurological condition</td>
<td>−3.70</td>
<td>2.11</td>
</tr>
<tr>
<td>Ulcers</td>
<td>−7.53**</td>
<td>1.95</td>
</tr>
<tr>
<td>Arthritis</td>
<td>−4.70*</td>
<td>1.89</td>
</tr>
<tr>
<td>Lung disease</td>
<td>−0.69</td>
<td>1.95</td>
</tr>
<tr>
<td>Asthma</td>
<td>−1.48</td>
<td>1.77</td>
</tr>
<tr>
<td>Mental hospitalization</td>
<td>−8.10**</td>
<td>2.09</td>
</tr>
<tr>
<td>Detox client</td>
<td>−4.42*</td>
<td>1.83</td>
</tr>
<tr>
<td>ASI alcohol composite</td>
<td>0.34</td>
<td>2.06</td>
</tr>
<tr>
<td>ASI drug composite</td>
<td>−15.61**</td>
<td>4.52</td>
</tr>
<tr>
<td>Intercept</td>
<td>68.48</td>
<td>4.38</td>
</tr>
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</table>

N = 523.
R² = .184.
MILQ = Multidimensional Index of Life Quality; ASI = Addiction Severity Index.
*p < .05.
**p < .01.
The regression results are shown in Table 3. MILQ Index scores were significantly lower for SA respondents with arthritis and ulcers, and declined with age. QOL scores were negatively associated with ASI drug composite scores, but were not independently affected by ASI alcohol composite scores. The zero-order Pearson correlations with the MILQ Index were −0.20 for the drug composite, but only −0.06 for the alcohol composite. Evaluated at the mean score for the sample, the effect of the ASI drug component is equivalent to a decline of 3.6 index points (effect size = 0.23). Index scores were significantly lower for detox clients than for outpatients. In addition, index values were more than 8 points lower for those with recent hospitalizations for mental health problems.

DISCUSSION

In this representative sample of adult clients treated for substance abuse disorders in Massachusetts, we measured QOL using two different instruments. The results indicate that QOL for these clients receiving public assistance was below that for the general adult population, and as low or lower than for patients with other serious chronic diseases and health conditions. Physical functioning levels for the SA clients were generally similar to those for patients with other chronic diseases. Mental functioning scores, however, were considerably lower for the SA clients. SF-12 Mental Health Component scores on average were comparable to those found for patients with clinically diagnosed depression. SA clients had significantly lower scores than patients undergoing cardiovascular surgery on seven of the nine domains measured by the MILQ, as well as the MILQ Index.

Overall QOL, as measured by the MILQ Index, was lower for detoxification clients than for outpatients. Detox respondents were interviewed at the treatment facility prior to discharge, a point at which well-being would be expected to be particularly low. A study of patients treated for substance dependence by Garg and his colleagues (14) also found less favorable SF-36 MCS scores for detoxification cases.

We used mental health facility hospitalizations in the past 6 months to identify cases of dual diagnosis, or clients diagnosed with both a psychiatric disorder and a substance use disorder. This hospitalization measure likely underestimates the true prevalence of psychiatric diagnoses in our sample. Dual diagnosis clients had significantly lower QOL scores than other study respondents. This finding is consistent with other studies that have found dual diagnosis effects on quality of life (15), psychosocial functioning (16), service utilization (17), and severity of impairment (18). However, this previous
research has been based on substance abusers identified within larger samples of psychiatric patients. In contrast, our dual diagnosis cases represent psychological disorders identified within a sample of substance abusers.

An important question in the substance abuse field is the extent to which alcohol and drug affect QOL independently of other diseases and health conditions. We used the ASI composite scores as measures of substance use severity. We found that overall QOL was negatively affected by ASI drug composite scores, but that ASI alcohol scores had comparatively little impact. Stein et al. (19) also found that alcohol and substance use explained little of the variation in the SF-20, a 20-item version of the SF-36. It is not clear why alcohol use did not have a greater impact, but the small zero-order correlation for this measure suggests that the estimated effect was not greatly diminished by controlling for the other characteristics in the regression model. In a group of alcohol-dependent adults, Daeppen et al. (20) found correlations of $-0.24$ and $-0.40$ between ASI alcohol scores and the physical functioning and mental health subscales of the SF-36. Correlations with the ASI may be larger in samples where all clients are homogeneous with respect to drug choice than in settings with a wider variety of substance users. In addition, our estimates are derived from a treatment sample in which all subjects have used substances. Stronger substance use effects might be found in general population studies that include both users and nonusers.

One important implication of the regression results is that QOL measures important aspects of functioning and well-being that is not captured by conventional measures of substance use such as the ASI. QOL may become an increasingly important outcome for assessing substance abuse treatment to the extent that it reflects broader aspects of functioning that are important to patients, coincides with treatment goals, and predicts treatment adherence. The growing recognition in the medical community that drug dependence should be viewed and treated as a chronic rather than acute illness (21) is also likely to increase interest in QOL. Collecting QOL data with standardized instruments not only makes it possible to compare the effects of substance abuse disorders with other chronic diseases, as we have done in this study, but also to directly compare the effectiveness of behavioral health interventions with other types of medical treatment.

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