

Assessment of the Quality of Life of Patients With Major Depression

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Objective: This study examined the relationship between a measure of quality of life and measures of depressive symptoms among patients with major depression. **Methods:** One hundred patients with primary major depression and 61 control subjects from the San Diego Veterans Affairs Medical Center and surrounding area were compared using a variety of measures, including the Quality of Well-Being (QWB) scale, the Hamilton Rating Scale for Depression, and the Beck Depression Inventory. **Results:** After analyses controlled for age, gender, family history of mental illness, and comorbid axis III diagnosis, subjects' scores on the QWB were significantly correlated with their scores on the Hamilton scale and Beck inventory. The severity of depressive symptoms was inversely related to quality of life as measured by the QWB, independent of the variables that were controlled for. **Conclusions:** The QWB is sensitive to symptoms of depression among patients diagnosed with major depression. The reduction in quality of life associated with psychiatric symptoms of depression is comparable to that observed among physically ill patients. (*Psychiatric Services* 48:224-230, 1997)

Depression is associated with substantial personal, social, and economic effects (1-5). Estimates of the one-month prevalence of major depression range from 2.2 to 4.9 percent, and estimated lifetime prevalence rates from 5.8 to 18 percent (6-9). Depression may adversely affect longevity and quality of life both during the episode and potentially for the remainder of life (10). In addition, depression seems to affect people more frequently during their more productive years (6-8). Although most episodes improve with

time and appropriate treatment, depression tends to recur and in some cases to be associated with incomplete recovery (11). Therefore, it is important to quantify both the severity of depressive symptoms and the personal impact of depression.

The Hamilton Rating Scale for Depression and the Beck Depression Inventory are commonly used to monitor depressive symptoms. These instruments do not, however, adequately address quality-of-life issues. Measures that address quality of life include depression-specific measures

(12,13) and generic measures (14,15).

The 36-item short-form health survey (SF-36) used in the Medical Outcomes Study is an example of a generic quality-of-life measure (15). In a large cohort of subjects, results from SF-36 subscales showed that patients with depressive symptoms had a similar or lower quality of life than patients with common chronic physical disorders (2). In addition, persons with dysthymia and major depression had similar SF-36 scores over a two-year period of time (17). A study by Ormel and colleagues (16) that used another instrument, the Social Disability Schedule, showed that the severity of depressive symptoms directly correlated with severity of social and occupational disability. They also observed that the social disability was relatively stable over time. Clearly, measures such as the SF-36 and the Social Disability Schedule are helping to quantify the disability associated with depression.

Over the past few years interest has increased in applying economic outcome methods, including cost-effectiveness and cost-utility analyses, to health care delivery. Cost-utility analysis requires a generic expression of health benefit. Typically, the generic unit used is a year of life. Thus cost-utility analysis considers the cost to produce the equivalent of a year of life.

A generic unit of health benefit by definition is not specific to a disease category or medical specialty. Psychiatry, like other medical specialties,

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competes for health care resources. Cost-utility analysis considers the return in health care benefits from investing in a specific service, such as psychiatry, compared with that from investing in other health care services. One important methodological challenge is to determine whether generic measures, used in a variety of areas of health care, also have validity for studies in mental health.

In this paper we introduce the Quality of Well-Being scale (QWB) as a measure of the health status or quality of life (18,19) of patients with a diagnosis of major depression. The QWB has several advantages, including a generic expression of health benefit based on well years of life, a single scale anchored by death, and a 20-year history of use in cost-utility analyses for various physical disorders. This paper will evaluate the validity of the QWB for use with patients with depression.

Despite the many strong points of the SF-36, we believe the QWB has several advantages over the SF-36. In particular, the QWB may be more sensitive to minor variations in wellness at both ends of the continuum. It is also less dependent on subjective reports of limitation because it assesses actual activity. It also covers a shorter time period and thus is less prone to recall biases.

Further, only the QWB provides utility-weighted outcomes that can be used for cost-utility analyses. The SF-36 cannot be used in cost-utility analysis because it does not place outcome on a single utility-weighted scale anchored by death. Such a scale is necessary for cost-utility analysis that requires trade-offs between quality and quantity of life.

Methods

Subjects

Data were collected between 1987 and 1993 from 100 patients with a current diagnosis of primary major depression and 61 normal control subjects. The study continuously enrolled subjects during this time and included follow-up evaluations every six months for up to five years. The patients included 40 inpatients and 60 outpatients who were participating in a study of life events and mood dis-

orders at the Mental Health Clinical Research Center at the University of California, San Diego. The inpatients were from the Veterans Affairs Medical Center in San Diego; outpatients were from both the VA Medical Center and the community. The control subjects were identified by VA Medical Center staff and were paid for their time. Before subjects entered the study, they received a complete description of the study procedures and provided written informed consent.

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Procedure and measures

To establish diagnoses, all subjects were interviewed using either the Schedule for Affective Disorders and Schizophrenia (SADS) (20), used in the study from 1987 to mid-1990, or the Structured Clinical Interview for DSM-III-R (SCID) criteria (21), used from mid-1990 through 1993. Final diagnoses were made by consensus of the Mental Health Clinical Research Center staff. Exclusion criteria included a diagnosis of primary bipolar disorder, primary psychotic disorder, primary organic mood disorder, or serious general medical illness. Control subjects did not have a current or past diagnosis of mental illness according to SADS and SCID criteria.

At baseline, all subjects completed an evaluation that included the Beck Depression Inventory, the Hamilton

Rating Scale for Depression, and the QWB.

The Beck inventory is a 21-item self-administered questionnaire (22). Probably the most commonly used self-rating scale for depression, it focuses on the cognitive and neurovegetative symptoms of depression. This questionnaire has undergone extensive reliability and validity testing (23). Possible scores on the Beck inventory range from 0 to 63, with higher scores indicating more severe depressive symptoms.

The Hamilton scale is a 21-item observer-rated scale based on a semi-structured interview. It has established reliability and validity (24,25) and is probably the most widely used scale in treatment studies of depression. It focuses primarily on the somatic and behavioral symptoms of depression. Possible scores on the Hamilton scale range from 0 to 62, with higher scores indicating more severe symptoms.

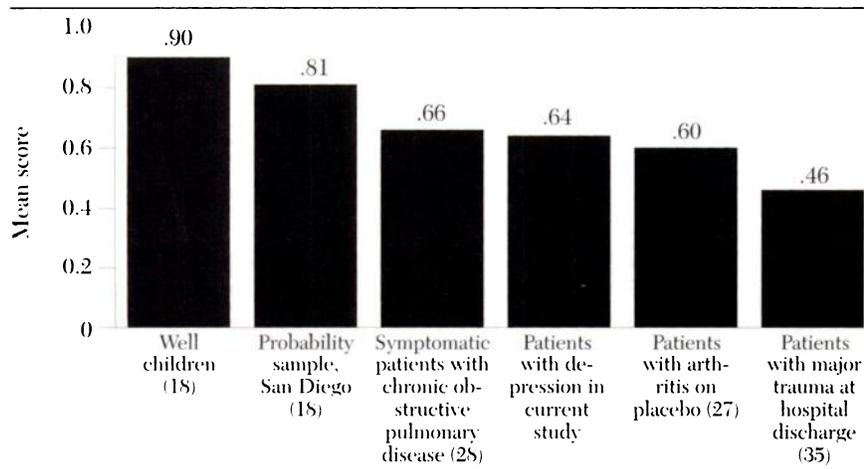
The QWB, an examiner-administered questionnaire, includes four subscales: symptom or problem complex, mobility, physical activity, and social activity (18,19). Each subscale has an established range of preference-weighted scores (18).

The preference weights were determined through surveys of a random sample of San Diego residents during two successive years. The probability sample included 866 respondents who were representative of the ethnic composition of the population. From a listing of all possible responses to the four QWB subscales, a stratified random sample of 343 case descriptions was developed and divided among eight sets of computer-generated booklets. All respondents were assigned randomly to rate the desirability of the case descriptions in one of the eight booklets, creating eight subgroups of approximately 100 respondents each.

In a series of studies, a mathematical model was developed to describe the respondents' decision process. The model has been cross-validated ($R=.94$). The preference weights that were developed describe the relative desirability of all of the functional levels and symptom-problem complexes. The four subscales combine on a scale from 0 (death) to 1.0 (asymptomatic

Figure 1

Mean scores on the Quality of Well-Being scale of various community and patient groups



optimum functioning). Thus a case description or a state with a weight of .50 is judged by the members of the community as being about half as desirable as optimum functioning or

about halfway between asymptomatic optimum functioning and death (19).

The QWB can be used at a single time point or over time. For example, an individual who was coughing and

ached all over, drove to the store for cough medicine, did not go to work, and stayed in bed most of the day would have a QWB score for that day of .605. If this condition remained unchanged for one year and the premorbid QWB score was 1.0, then the individual would effectively lose .395 well-years ($1 - .605 = .395$). If an identical course of illness was observed for ten persons, collectively they would lose a total of 3.95 well-years. The same process can be used to calculate well-years gained with treatment by comparing the course with and without treatment.

The QWB has been used as a measure of health status for several physical illnesses including arthritis (26,27), chronic obstructive pulmonary disease (28,29), cancer (30), HIV (31), cystic fibrosis (32), atrial fibrillation (33), diabetes mellitus (34), major trauma (35), and others (36). Figure 1 shows sample QWB scores for various conditions from earlier studies using the instrument.

Table 1

Demographic characteristics of patients with major depression and normal control subjects

Characteristic	Patients (N=100)		Control group (N=61)		χ^2	df	p<
	N	%	N	%			
Gender					9.74	1	.01
Female	18	18	1	1.6			
Male	82	82	60	98.4			
Ethnicity					.03	1	ns
Caucasian	91	91	56	91.8			
Non-Caucasian ¹	9	9	5	8.2			
Work status					32.83	3	.001
Works full time	29	29	42	68.9			
Works part time	12	12	5	8.2			
Unemployed	42	42	3	4.9			
Other ²	17	17	11	18.0			
Education					19.94	3	.001
High school or less	28	28	4	6.7			
Some college	36	36	19	31.1			
College degree	27	27	19	31.1			
Advanced degree	9	9	19	31.1			
Marital status					6.15	3	ns
Never married	17	17	18	29.5			
Married	37	37	25	41.0			
Divorced	40	40	17	27.9			
Other ³	6	6	1	1.6			
Family history of mental illness					28.48	2	.001
None	34	34	47	77.0			
History of mood disorder	36	36	6	9.8			
Other history ⁴	30	30	8	13.1			

¹ Non-Caucasians included African Americans, Asians, and Hispanics.

² Includes retired, never worked, homemaker

³ Includes widowed and separated

⁴ Family history of mental illness other than mood disorder, for example, substance abuse or psychosis

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences, version 4.0. The patient sample was divided into three groups—mild, moderate, and severe symptoms of depression—based on Hamilton scale and Beck inventory scores. Continuous data were analyzed using t tests and analyses of variance (ANOVA). Categorical data were analyzed using chi square tests. A hierarchical regression analysis with QWB scores as the dependent variable was done. Initially we entered the variables of age, gender, family history of mental illness, and presence of an axis III diagnosis in the regression analysis and then added Hamilton and Beck scores with presence of a comorbid axis I diagnosis in separate analyses.

Results

Table 1 shows demographic characteristics of the patient group and the control group. Subjects' mean \pm SD age was 48.5 ± 12.1 years for the patient group and 47.4 ± 13.7 for the control group. The patient group consisted of 82 men and 18 women. Thirty-six percent of the patients had a first-degree relative with a history of mood disorder.

der, and 30 percent had a first-degree relative with a history of other types of psychiatric disorder, such as a psychotic disorder or a substance abuse disorder. Sixty-four percent of the patients had comorbid axis I diagnoses. Of those patients, 61 percent had substance abuse or dependence disorder in full remission, 20 percent had dysthymia, and 16 percent had anxiety disorders. Seventy-four percent of the patients had at least one axis III diagnosis.

At the time of the baseline evaluation for the study, 77 percent of the patients were prescribed psychotropic medications. Because the study design was observational, patients could enter the study after initiating treatment. Sixteen percent of the patients were in partial remission at the time of the baseline evaluation.

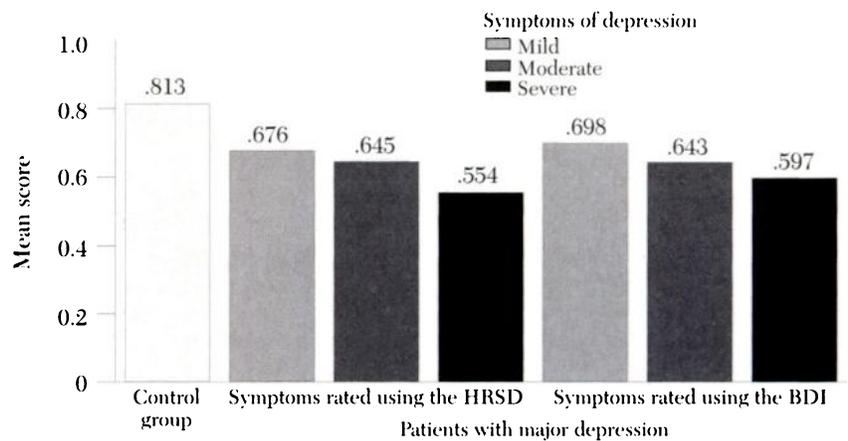
The control group consisted of 60 men and one woman. Six control subjects, or 9.8 percent, had a first-degree relative with a history of mood disorder, and eight, or 13.1 percent, had a relative with a history of psychiatric disorder other than mood disorder. None of the control subjects were prescribed psychotropic medications. In general, compared with the patient group, the control subjects were more likely to be male and to work full time, had more education, and were less likely to have a family history of mental illness. The patient and control groups did not differ significantly in age, ethnicity, or marital status.

In the patient group, the mean \pm SD score on the QWB was $.639 \pm .110$ for the male patients and $.655 \pm .092$ for the female patients, not a significant difference. Patients with a family history of mood disorders had a mean QWB score of $.636 \pm .110$, and those without such a family history had a mean score of $.628 \pm .096$, also not a significant difference.

Patients were grouped according to the highest level of education they had achieved. The mean QWB scores for these groups were compared using a one-way ANOVA followed by a Student-Newman-Keuls pairwise comparison. The results showed no significant differences between groups in QWB scores. In summary, there were no significant differences in the QWB scores of patients based

Figure 2

Mean scores on the Quality of Well-Being scale of control group subjects and subjects with major depression rated using both the Hamilton Rating Scale for Depression (HRSD) and the Beck Depression Inventory (BDI)¹



¹ N=61 for the control group; N=95 for patients rated using the HRSD; N=87 for patients rated using the BDI

² Mild symptoms indicated by scores less than 10 on the Hamilton Rating Scale for Depression and on the Beck Depression Inventory, moderate symptoms by scores from 10 to 18, and severe symptoms by scores greater than 18

on gender, family history of mental illness, or education.

To evaluate the effect of physical illness on QWB scores, the patient group was divided into those with at least one axis III diagnosis and those with no axis III diagnosis. The mean QWB score of patients with no axis III diagnosis was $.687 \pm .106$, compared with $.630 \pm .101$ for patients with at least one axis III diagnosis ($t=2.38$, $df=95$, $p<.05$).

We also evaluated the effect of comorbid axis I disorders. As mentioned above, 64 percent of patients had comorbid axis I diagnoses. Patients without a comorbid axis I diagnosis had a QWB score of $.685 \pm .090$, compared with $.618 \pm .108$ for those with at least one comorbid axis I diagnosis ($t=-3.16$, $df=97$, $p<.05$).

Figure 2 shows the differences in QWB scores for the control subjects and for the patients, grouped accord-

Table 2

Hierarchical multiple regression analyses of variables predicting score on the Quality of Well-Being scale¹

Variable	Analysis 1		Analysis 2	
	Step 1	Step 2	Step 1	Step 2
Age	.10	—	.09	—
Gender	.15	—	.16	—
Family history of mental illness	.18	—	.16	—
Axis III diagnosis	-.24*	—	-.23*	—
Hamilton Rating Scale for Depression score	—	-.47**	—	—
Comorbid axis I diagnosis	—	-.21*	—	-.13
Beck Depression Inventory score	—	—	—	-.48**
Overall F	2.84*	8.67**	2.50*	7.87**
df	4,88	6,86	4,81	6,79
R ² change	.11	.26	.11	.26

¹ Reported values are standardized regression coefficients.

* $p<.05$

** $p<.001$

ing to Hamilton scores and according to Beck scores as having mild, moderate, or severe symptoms of depression. The mean Hamilton scale and Beck inventory scores for the patient group with severe symptoms were 22.5 and 25.6, with ranges from 19 to 28 and from 19 to 40, respectively. The QWB scores for the patients with mild, moderate, and severe symptoms, grouped according to their Hamilton scale scores were .676, .645, and .554, respectively, and the QWB scores for the patients grouped according to their Beck inventory scores were .698, .643, and .597, respectively. The ANOVA equations using the QWB score as the dependent variable were highly significant, both when the patients were grouped by Hamilton scale scores ($F=44.69$, $df=3,152$, $p<.001$, main effect; $F=127.21$, $df=1,152$, $p<.001$, planned comparison for linearity) and when they were grouped by Beck inventory scores ($F=41.53$, $df=3,144$, $p<.001$, main effect; $F=120.30$, $df=1,144$, $p<.001$, planned comparison for linearity).

To evaluate which of seven variables—age, gender, family history of mental illness, presence of an axis III diagnosis, presence of a comorbid axis I diagnosis, Hamilton scale score, and Beck inventory score—best predicted the QWB score, a hierarchical multiple regression analysis was conducted. The results are shown in Table 2. In step 1 we entered age, gender, family history, and presence of an axis III diagnosis into the regression equation. These variables accounted for 11 percent of the total variance. Axis III diagnosis was the only statistically significant variable, indicating the expected inverse relationship between the presence of an axis III disorder and QWB score. Step 2 was first run entering comorbid axis I diagnosis and Hamilton scale score, which resulted in a highly significant equation accounting for an additional 15 percent of the variance. Both the Hamilton scale score and the presence of a comorbid axis I diagnoses were significantly related to the QWB score, after controlling for the variables entered in step 1 of the analysis.

To test the generalizability of this finding, we repeated the hierarchical

regression substituting the score on the self-rated Beck inventory for the score on the examiner-rated Hamilton scale. Step 2 again resulted in a highly significant equation and accounted for an additional 15 percent of the variance. However, in this equation, the presence of a comorbid axis I diagnosis was not a statistically significant variable.



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Discussion and conclusions

This study considered the relationship between a quality-of-life measure, the Quality of Well-Being scale, and measures of depressive symptoms. To our knowledge, this study was the first to examine use of the QWB scale as a measure of quality of life in a patient population with a diagnosis of primary major depression. The analysis suggests that the QWB scale is a sensitive indicator of morbidity and disease severity among patients with major depression. We found no significant difference in patients' QWB scores based on age, gender, education, or family history of mental illness.

We did, however, find significant inverse relationships between score on the QWB and presence of a co-

morbid axis III diagnosis, presence of a comorbid axis I diagnosis, Hamilton scale score, and Beck inventory score. The relationship between axis III diagnosis and the QWB score is not surprising, given previous research on effects of physical illnesses on quality of life. However, we found that after controlling for the effect of axis III diagnosis in the first step of a hierarchical regression, the QWB score remained significantly correlated with the Hamilton scale score, with the presence of a comorbid axis I diagnosis, and with the Beck inventory score.

In comparing the regression coefficients of these variables, the Hamilton scale score and the Beck inventory score, with coefficients of $-.47$ and $-.48$, respectively ($p<.001$), appear to be the strongest predictors of the QWB score in this patient population. This finding suggests that the QWB is more sensitive to depressive symptoms, as indicated by the Hamilton scale and the Beck inventory, than to comorbid axis I or axis III diagnoses in this patient population.

The QWB provides scores on a defined scale ranging from death to full functioning without symptoms. The meaning of differences in QWB scores is defined by human judgment about the placement of health states along this continuum. For example, the difference between QWB scores of $.70$ and $.75$, a difference of $.05$, is equal to about 5 percent of the difference between death and wellness. Studies of community members' preferences suggest that most observers judge cases with scores separated by a difference of $.02$ or less as about equivalent and that differences larger than $.02$ can be detected by the average observer (19). In this study, the observed differences between control subjects and patients ranged from $-.14$, for mildly depressed patients to $-.26$, for severely depressed patients. These differences mean that for every 100 patients remaining mildly depressed for one year, 14 well-years would be lost among them, and for every 100 patients who remained severely depressed, 26 well-years would be lost.

Our study has several limitations. Because the patient sample was pre-

dominantly made up of male veterans, it cannot be seen as representative of the community population of depressed patients. We cannot be certain to what extent our findings can be generalized to community samples that have higher proportions of women and nonveterans.

Women were underrepresented in both the control group and the patient group. The QWB score in the general population tends to be higher among men before age 45 and among women after age 45 (37). If our control group had included more women, the mean QWB score for that group may have been higher, thus increasing the difference between the study groups. Therefore, any gender-related bias that was introduced by the predominance of male subjects in the control group would have been in a conservative direction. In addition, the mean QWB score for control subjects was very similar to that of the San Diego sample involved in the original preference studies for the instrument, suggesting that the control subjects in our study were not atypical (See Figure 1). When we limited our comparison to male subjects, the differences between the patient group and the control group remained ($F=43.08$, $df=3,133$, $p<.001$, main effect; $F=124.37$, $df=1,133$, $p<.001$, planned comparison for linearity).

An additional limitation is the potential confound of depressive symptoms and the QWB symptom-problem subscale. One of the 24 items in the subscale rates "spells of feeling upset, being depressed, or of crying," and the score for the subscale is based on the symptom-problem complex rated as most distressing by the subject. However, in our study, 81 percent of the patient sample chose a symptom-problem complex other than depressed mood as most distressing. Therefore, this potential confound could have had only a limited effect on the analysis.

Another concern is that scores on the QWB subscale rating mobility could be affected by inpatient status. The mobility subscale asks directly about inpatient status as an indicator of illness severity. In our study, inpatients had a mean overall QWB score

of .567, compared with .679 for outpatients ($t=5.31$, $df=84$, $p<.001$). We think this difference is an accurate reflection of difference in illness severity, as the mean Hamilton scale scores for inpatients and outpatients were 16.1 and 11.8, respectively.

There is also concern that both the QWB and measures of depression depend on patients' self-reports and that the cognitive distortions associated with depression may artificially inflate the correlation between self-report measures. Unfortunately, valid and reliable measures of depression that are free of self-report information are not available. However, self-report measures of both quality of life and depression have been validated in a wide variety of studies. Outcomes research is based on the measurement of outcomes from the patient's perspective. As such, outcomes research cannot avoid using information generated by patients' reports. The effect of cognitive distortion associated with depression on self-reported quality of life is an important issue that will require future study.

Another potential confound relates to the effects of socioeconomic status, specifically employment, on health status (38). The QWB represents the overall effects of health conditions on health-related quality of life. Not working because of a health problem, for example, will result in a lower QWB score. Removing questions about employment from the QWB would take away a central component of the content. Although QWB scores and socioeconomic status are correlated, we are unable to say whether low socioeconomic status causes lower quality of life or whether illness interferes with the ability to earn income. Long-term prospective studies would be necessary to clarify this issue.

The standardization of quality of life is admittedly a complicated process. The Quality of Well-Being scale provides a reasonable and useful determination of this complex variable. We believe the use of preference-weighted rating scales is an appropriate approximation for measuring quality of life, and that the QWB, in particular, is potentially useful for cost-utility analyses. Future studies

are needed to replicate these results, examine the changes in QWB scores over time, and evaluate the use of the QWB among patients with other psychiatric illnesses besides major depression. ♦

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Correction

In the paper entitled "The Impact of Medicaid Managed Care on Child and Adolescent Emergency Mental Health Screening in Massachusetts," by Joanne Nicholson, Ph.D., Stephen Dine Young, M.A., Lorna Simon, M.A., Anne Bate-man, R.N., Ed.D., and William H. Fisher, Ph.D., in the December 1996 issue (pages 1344-1350), there is a typographical error in column 2 of Table 2 on page 1349. The percentage of children and adolescents with a presenting problem in the symptoms category in the year after implementation of Medicaid managed care should be 9.3.