Gender Differences in Health-Related Quality of Life in Patients with Bipolar Disorder

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Abstract

Purpose—Health-related quality of life (HRQOL) is a widely-accepted measure of illness state that is related to morbidity and mortality. Findings from various populations show that women report lower HRQOL than men. We analyzed baseline HRQOL data for gender differences from a multisite, randomized controlled study for adults with bipolar disorder.

Methods—HRQOL was assessed using the SF-12 physical (PCS) and mental (MCS) health scales. Multivariate linear and bivariate regression models examined differences in self-reported data on demographics, depressive symptoms (PHQ-9), bipolar disorder symptoms (Internal State Scale), and medical comorbidities.

Results—Out of 384 enrolled (mean age=42 years), 256 were women (66.7%). After controlling for sociodemographic characteristics and clinical factors, women had lower SF-12 PCS scores than men ($\beta= -1.78$, SE= 0.87, p<.05), indicating worse physical health, but there were no gender differences in MCS scores. After controlling for patient factors including medical and behavioral comorbidities, the association between gender and PCS score was no longer significant. Of the medical comorbidities, pain was associated with lower PCS scores ($\beta= -4.90$, SE= 0.86, p<.0001).

Conclusions—Worse physical HRQOL experienced by women with bipolar disorder maybe explained by medical comorbidity, particularly pain, suggesting the importance of gender-tailored interventions addressing physical health conditions.

Keywords

Quality of Life; Bipolar Disorder; Gender; Comorbidity

INTRODUCTION

Bipolar disorder affects up to 6.4 % of the population and is associated with poor functional outcomes and high societal costs (Judd and Akiskal 2003). The World Health Organization ranks bipolar disorder as the twelfth most disabling health condition worldwide (World

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Health Organization 2008). Mortality risk, particularly from cardiovascular disease, is increased in those with bipolar disorder, estimated at 1.5 to 2.5 times greater than the general population (Osby et al. 2001; Roshanaei-Moghaddam and Katon 2009; Ramsey et al. 2010). In addition, bipolar disorder is the most costly mental health condition, and analyses of some health care plans show up to 70% of these costs occur in non-mental health settings (Bryant-Comstock et al. 2002; Kleinman et al. 2003). The estimated total annual prevalence-based cost of bipolar disorder in 2009 was $151 billion, which includes the impact of indirect costs of morbidity and premature mortality (Dilsaver 2011).

Compared to the general population and even other psychiatric illnesses, patients with bipolar disorder report lower levels of quality of life (Kilbourne et al. 2009; Michalak et al. 2005; Michalak et al. 2008; Fenn et al. 2005). Health-related quality of life (HRQOL) is a widely accepted measure of health and illness states that is associated with morbidity and mortality status as well as health care utilization (Guyatt et al. 1993; Singh et al. 2005). Arnold and colleagues (Arnold et al. 2000) assessed health-related quality of life using the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), a self-administered questionnaire in which lower scores are indicative of greater impairment. They found that patients with bipolar disorder (N=44) reported lower mean scores of HRQOL than the general population on all scales except physical functioning. In the Netherlands Mental Health Survey and Incidence Study (NEMESIS), participants with bipolar disorder type 1 (N=93) showed significantly lower mean SF-36 scores compared to subjects with other psychiatric disorders (ten Have et al. 2002).

Previous studies examining gender differences of self-rated HRQOL show that women report a lower HRQOL than men in different populations (Jorngarden et al. 2006; Mrus et al. 2005; Arrington-Sanders et al. 2006). A study of elderly subjects (N=544) utilized the Nottingham Health Profile (NHP), a generic measure of HRQOL, and found women exhibited worse results than men on HRQOL (mean of NHP total score 28.3 vs. 16.7, $p<0.001$) (Orfila et al. 2006). In the PRIME-MD study, HRQOL assessed using the Medical Outcomes Study SF-20 was significantly lower in women than in men, but these differences in HRQOL were no longer significant in five of six domains after controlling for mental disorder diagnoses (Linzer et al. 1996). In a population of U.S. Veterans with serious mental illness, female Veterans reported lower scores on the SF-36 physical component summary, more limitations on activities of daily living, and more pain than male Veterans (Teh et al. 2008). Among patients specifically diagnosed with bipolar disorder, Robb and colleagues (Robb et al. 1998) found that women reported numerically lower SF-20 scores across most domains, with significant differences in pain and physical health.

Nonetheless, few studies examined whether these gender differences in HRQOL in bipolar disorder remained significant after controlling for bipolar episode or symptom burden. Previous studies suggest that the particular stage of bipolar disorder (i.e., manic, mixed, depressive, or euthymic) may have an impact on HRQOL (Ozer et al. 2002; MacQueen et al. 2000; Endicott et al. 1993). Evidence also suggests that women are more likely to experience depressive than manic episodes, which might explain differences in HRQOL (Altshuler et al. 2010; Christensen et al. 2003; Roy-Byrne et al. 1985). This is important as further understanding of how gender affects HRQOL in patients with bipolar disorder can help inform treatment and prognosis for this complex condition. Using comprehensive baseline data on clinical and sociodemographic factors from a national study of patients with bipolar disorder from community-based practices, the primary aim of this study is to investigate gender differences in HRQOL among patients with bipolar disorder and to assess whether bipolar disorder symptoms or medical comorbidity explained HRQOL differences.

MATERIALS AND METHODS

Baseline data were ascertained from the Recovery-oriented Collaborative Care (ROCC) study, a multisite study of bipolar disorder treatment implementation from community mental health or primary care programs in Michigan or Colorado. Details of ROCC are reported elsewhere (Kilbourne et al. 2012). In brief, participating clinical sites were selected from three large organizations from the Michigan and Colorado regions: Washtenaw Community Health Organization (WCHO, Ann Arbor, MI) Genesee County Community Mental Health (GCCMH, Flint, MI), and Colorado Access (CO Access, Aurora, CO). Patient outcomes at baseline, 6, 12 and 24 months into the study were monitored at each of the sites starting in March 2010, and patient enrollment ended in December 2011. The study target population consisted of adult patients with a diagnosis of bipolar disorder (bipolar I, II, NOS, or bipolar-schizoaffective subtype) receiving care from the participating sites. Patient inclusion criteria were: 1) 18 years of age or older; 2) currently being seen as a patient at the particular site; 3) active diagnosis or treatment plan for Bipolar I, Bipolar II, Bipolar NOS; and 4) community-dwelling (i.e., not living in a nursing home or other institution). Patient exclusion criteria were: 1) serious illness or evidence of intoxication at enrollment precluding participation in the collaborative care intervention components as indicated by the provider or 2) inability to provide informed consent. The study was reviewed and approved by local IRBs, and for this paper only baseline data were analyzed.

Measures

The dependent variable was HRQOL, assessed using the Short Form 12-item survey (SF-12) (Ware et al. 1996), a widely used and validated instrument that generates two summary scores to reflect physical (PCS) and mental (MCS) health–related quality of life. The SF-12 was highly correlated with the longer SF-36 on the PCS (r=0.92) and MCS (r=.91) scales. Possible scores range from 0 to 100 for each scale, with higher scores indicating better health.

Key independent variables included patient demographics (age, gender, race, education), as well as depressive symptoms, bipolar current episode, and medical comorbidities. The Patient Health Questionnaire-9 (PHQ-9) was used to assess depressive symptoms (Kroenke et al. 2001). The PHQ-9 is the 9-item depression module from the full PHQ, a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders. Possible scores range from 0 to 27, with higher scores indicating more severe depressive symptoms. Bipolar disorder current episode was assessed with the Internal State Scale (ISS), a 15-item self-completed instrument that consists of 4 subscales: activation, wellbeing, depression index, and perceived conflict. An algorithm using scores from the activation and wellbeing subscales was used to identify an individual into a manic, depressed, mixed, or euthymic state (see Table 1). These ISS subscale categories were highly correlated with clinician ratings of current episode (Bauer et al. 2000; Glick et al. 2003). Self-reported comorbid medical conditions were based on questions regarding whether the participant was even told they had any of the following: diabetes, hypertension, heart disease (history of angina or myocardial infarction), or pain (Fenn et al. 2005). Hazardous drinking was assessed using the 3-item AUDIT-C (Dawson et al. 2005) using a common screening algorithm for men and women (Bush et al. 1998). Current smoking status was ascertained by a yes/no response to the question, "do you smoke cigarettes now?"

Analyses

To assess for demographic differences in the sample, we used t-test and Chi square analyses to study gender differences across variables. We then examined the bivariate relationship between gender and the HRQOL outcomes using t-test and Chi-square analyses.

Multivariate linear and logistic multiple regression models were used to examine the association between gender and the SF-12 PCS and MCS scores using three models in which we progressively controlled for additional clinical factors in order to determine whether psychiatric or medical factors may have explained the association between gender and HRQOL. The first model adjusted for the socio-demographic characteristics of age, race, college education; the second model added depressive symptoms based on the PHQ-9 and bipolar current episode; and finally the third model added each medical comorbidity.

RESULTS

Of the 384 enrolled at baseline, 256 (66.7%) were women and the mean age was 42.0 years (SD=11.3; Range 18–70 years). Nineteen percent (N=71) had received a college education or higher, and 17% were African American and 9.1% Hispanic (Table 1). Compared to males, female respondents were more likely to be college-educated (21.8% versus 12.7%, p <0.05).

Women with bipolar disorder had lower mean PCS scores (35.9 versus 37.7, p <0.05), indicating worse physical health. However, there was no significant differences in mean MCS scores between women and men (31.8 versus 32.0, p=0.73), see Table 1.

Multivariable analyses revealed similar findings regarding PCS scores, which were still lower for women compared to men after adjusting for socio-demographic factors (β= −2.08, SE= 0.87, p<.05) (Table 2). After adjusting for clinical factors including depressive symptoms and bipolar current episode, PCS scores were still significantly lower for women compared to men (β= −1.78, SE= 0.87, p<.05). Depressive symptoms were also associated with lower PCS as well as MCS scores after adjustment in the second model (Table 2).

After additionally controlling for medical comorbidities and behavioral risk factors, we found no significant gender difference for either components of the SF-12 [PCS (β= −1.34, SE= 0.85, p=0.12) or the MCS (β= 0.27, SE= 0.85, p=0.75)]. Of the medical comorbidities, pain was associated with lower scores on the PCS of the SF=12 (β= −4.90, SE= 0.86, p<. 0001), indicating worse physical health. Hazardous drinking was also associated with increased PCS scores (β=3.67, SE=1.24, p=.003).

DISCUSSION

To our knowledge this is one of the first studies to determine whether gender differences in HRQOL among patients with bipolar disorder might explained by physical health problems. In this large multisite study, we found that women were more likely to report worse physical health-related quality of life than men, even after adjusting for socio-demographic characteristics, behavioral, and psychiatric factors. However, this finding was no longer statistically significant after controlling for medical comorbidity. In particular, poorer HRQOL experienced by women may have been explained by worse self-reported pain, and depression continued to be an important contributor to poorer HRQOL overall for both groups.

Prior research on gender differences in HRQOL among persons with mood disorders has primarily focused on the relationship between HRQOL and psychiatric symptoms. Among patients with bipolar disorder, previous studies found that depressive episodes were a stronger determinant of lower HRQOL than manic episodes, even after controlling for socio-demographic and mental health treatment factors (MacQueen et al. 2000; Ozer et al. 2002; Endicott et al. 1993). The results of our study support these findings, as depression was significantly associated with poorer mental and physical HRQOL.

We found that the association between gender, depression, and HRQOL was explained at last in part by physical comorbidity, particularly pain. Poor HRQOL can affect a patient's treatment response and his or her likelihood to seek mental health as well as general medical treatment. Moreover, the positive association between hazardous drinking and physical HRQOL suggests that study participants may have engaged in hazardous drinking as a pain coping strategy. However, pain was still independently associated with physical health-related quality of life even after controlling for hazardous drinking. While previous evidence suggests that women are more likely to experience pain than men (Robb et al. 1998; Teh et al. 2008), this study also suggests that pain in particular contributes to poorer HRQOL independent of bipolar or depressive symptoms. This finding underscores the need to pay attending to physical as well and mental health symptoms among women suffering from this illness.

There are limitations to this study that should be considered. The cross-sectional nature of the study precluded us from examining longitudinal trends in HRQOL and measures of effect. Self-reported symptom assessments may not be as sensitive in detecting mood symptom changes as clinician-based assessments. Furthermore, our baseline survey did not assess the presence of pain-related conditions, pharmacotherapy, or use of pain medications which might have affected self-reported pain responses. This study is also limited to patients with bipolar disorder. However, as bipolar disorder is associated with several comorbidities, we believe that it is a representative mental disorder given its significant impact on HRQOL.

CONCLUSION

Overall, our study suggests that women with bipolar disorder independently have worse physical HRQOL, which might be explained by increased self-reported pain. Given that 50–70% of overall health care costs of persons with bipolar disorder are attributable to medical conditions, this study further supports integrated medical and mental health programs for this illness. For women with bipolar disorder, additional interventions that focus on the role of pain are also warranted in order to ultimately improve long-term outcomes for this group.

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Table 1

Demographics and bivariate analyses showing the effect of gender on HRQOL in patients with bipolar disorder

Variable	Total		Women		Men		p
	N=384	%	N=256	%	N=128	%	
Demographics							
Age (M ± SD)	42.04±11.34		41.98±11.57		42.16±10.89		0.88
Race							0.04
African-American	64	17.07	40	16.06	24	19.05	
Hispanic	34	9.07	29	11.65	5	3.97	
Other[a]	277	73.87	180	72.29	97	76.98	
College education	71	18.78	55	21.83	16	12.7	0.03
Current smoker	190	57.58	114	54.03	76	63.87	0.08
Hazardous drinking[b]	40	10.67	25	10.08	15	11.81	0.60
Bipolar Episode [c]							
Depressive	40	10.42	27	10.55	13	10.16	0.89
Manic	168	43.75	110	42.97	58	45.31	
Mixed	74	19.27	52	20.31	22	17.19	
Euthymic	102	26.56	67	26.17	35	27.34	
Depressive Symptoms (Mean ± SD)							
PHQ-9[d]	12.99±6.40		13.37±6.28		12.24±6.60		0.1
Quality of Life-SF-12 (Mean ± SD)							
MCS-12[e]	31.81±8.36		31.70±8.36		32.03±8.39		0.73
PCS-12[f]	36.47±7.50		35.90±7.45		37.68±7.49		0.03

[a]Other" race means non-Hispanic and non-African American.

[b]Current hazardous drinking based on the 3-item AUDIT-C with hazardous drinking defined as scoring at least a four (for men) or three (for women) on a 0–12 scale with higher scores indicating more severe drinking.

[c]Current episode based on the 15-item Internal State Scale (ISS) where individual items are scored from 0 to 100 on an 11-point scale to derive subscales of Well Being and Activation (not shown). Depressed mood is characterized by an Activation score < 155 and a Well-Being score of < 125; Hypomanic and Manic episodes are characterized by an Activation score 155 and 125; Mixed states are characterized by an Activation score 155 and a Well-Being score < 125; and Euthymic episodes are characterized by an Activation score < 155 and 125.

[d]Patient Health Questionnaire-9 depression scale (0 – 27), with higher scores indicating more depressive symptoms such that 5–9 are indicative of minimal symptoms, 10–14 suggest dysthymia or mild major depression, 15–19 suggest moderately severe major depression, and greater than or equal to 20 equates to severe major depression symptoms.

[e]The 12-Item Short Form Health Survey – Mental Component Summary (0 – 100), with higher scores indicating better mental health.

[f]The 12-Item Short Form Health Survey – Physical Component Summary (0 –100), with higher scores indicating better physical health.

Table 2

Multiple regression models using patient and clinical characteristics to show the effect of gender on HRQOL in patients with bipolar disorder

Variable	Model 1[*]	MCS[a] Model 2[*]	Model 3[*]	Model 1[*]	PCS[b] Model 2[*]	Model 3[*]
Demographic						
Female	−0.44 (−2.39, 1.51)	0.49(−1.16, 2.14)	0.15(−1.63, 1.94)	[*]−2.08(−3.79, −0.36)	[*]−1.78(−3.49, −0.07)	−1.31 (−2.98, 0.36)
Age	[*]0.12(0.04, 0.19)	[*]0.10(0.03, 0.16)	0.07(−0.01, 0.16)	[*]−0.16(−0.23, −0.09)	[*]−0.17(−0.24, −0.09)	−0.07(−0.14, 0.01)
Race						
African American	−0.96(−3.46, 1.54)	−1.59(−3.69, 0.51)	−1.77(−4.09, 0.57)	−0.54(−2.73, 1.66)	−0.63(−2.81, 1.55)	0.33(−1.85, 2.51)
Hispanic	0.22(−2.87, 3.32)	−0.48(−3.09, 2.13)	−0.94(−4.08, 2.19)	0.17(−2.55, 2.89)	−0.01 (−2.71, 2.69)	0.49(−2.43, 3.43)
Other[c]	1.11(−3.11, 5.33)	0.81(−2.74, 4.36)	0.07(−3.69, 3.84)	−1.89(−5.59, 1.82)	−1.89(−5.56, 1.79)	−0.08(−3.61, 3.44)
College education	0.41(−1.97, 2.79)	0.26(−1.76, 2.27)	1.03(−1.39, 3.45)	1.48(−0.61, 3.57)	1.29(−0.79, 3.37)	−0.28(−2.54, 1.98)
Bipolar episode [d]						
Depressive		−1.97(−4.92, 0.97)	−2.62(−5.89, 0.64)		0.84(−2.21, 3.89)	0.57(−2.49, 3.62)
Manic		1.35(−0.62, 3.32)	0.83(−1.33, 2.99)		0.12(−1.92, 2.16)	0.55(−1.48, 2.57)
Mixed		−1.83(−4.47, 0.81)	−1.96(−4.91, 0.98)		−0.47(−3.21, 2.26)	0.36(−2.39, 3.12)
Depressive symptoms [e]						
PHQ-9		[*]−0.63(−0.77, −0.49)	[*]−0.62(−0.77, −0.47)		[*]−0.2(−0.34, −0.06)	−0.19(−0.34, −0.05)
Medical comorbidity						
Hypertension			−0.31(−2.29, 1.68)			−2.09(−3.95, −0.23)
Pain			1.63(−0.16, 3.42)			[*]−4.90(−6.58, −3.22)
Heart disease			1.06(−2.59, 4.71)			−2.05(−5.46, 1.36)
Diabetes **Behaviors**			1.82(−0.58, 4.23)			−0.36(−2.61, 1.89)
Hazardous Drinker[f]			1.36(−1.25, 3.96)			[*]3.67(1.24, 6.11)
Current smoker			−0.86(−2.62, 0.91)			1.13(−0.52, 2.79)

[*] Model 1 controlled for age, race, college education. Model 2 controlled for age, race, college education + clinical factors on the ISS (depressive, manic, mixed, euthymic) and depression on the PHQ-9. Model 3 controlled for for age, race, college education + clinical factors on the ISS (depressive, manic, mixed, euthymic) and depression on the PHQ-9 + medical comorbidities (hypertension, pain, heart disease, diabetes), as well as current smoking status and hazardous drinking

[a] The 12-Item Short Form Health Survey – Mental Component Summary (0 – 100), with higher scores indicating better mental health.

[b] The 12-Item Short Form Health Survey – Physical Component Summary (0 –100), with higher scores indicating better physical health.

[c] Other" race means non-Hispanic, non-African American, and non-white.

[d] Current episode based on the 15-item Internal State Scale (ISS) where individual items are scored from 0 to 100 on an 11-point scale to derive subscales of Well Being and Activation (not shown). Depressed mood is characterized by an Activation score < 155 and a Well-Being score of < 125; Hypomanic and Manic episodes are characterized by an Activation score 155 and 125; Mixed states are characterized by an Activation score 155 and a Well-Being score < 125; and Euthymic episodes are characterized by an Activation score < 155 and 125.

[e] Patient Health Questionnaire-9 depression scale (0 – 27), with higher scores indicating more depressive symptoms such that 5–9 are indicative of minimal symptoms, 10–14 suggest dysthymia or mild major depression, 15–19 suggest moderately severe major depression, and greater than or equal to 20 equates to severe major depression symptoms.

[f] Current hazardous drinking based on the 3-item AUDIT-C with hazardous drinking defined as scoring at least a four (for men) or three (for women) on a 0–12 scale with higher scores indicating more severe drinking.