

Determinants of Quality of Life in Primary Care Patients with Diabetes: Implications for Social Workers

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Using a cross-sectional design of 400 primary care patients with diabetes, the authors evaluated demographics, health status, subjective health and mental health, health behaviors, health beliefs, knowledge of diabetes treatment, satisfaction with medical care, and quality of medical care as potential predictors of QoL and QoL in the hypothetical absence of diabetes. Those who reported difficulties meeting basic needs, diabetes-related complications, worse subjective health, and dissatisfaction with medical care were more likely to report worse QoL. Those who reported difficulties meeting basic needs, higher cholesterol level, and worse subjective health also were more likely to report better QoL in the hypothetical absence of diabetes. In addition, diabetes management played a major role in one's QoL in the hypothetical absence of diabetes: Engaging in stricter diabetes self-care and taking pharmaceutical treatment for managing diabetes were associated with better QoL in the hypothetical absence of diabetes. Providing psychosocial support geared toward diabetes self-management may improve patients' QoL. When doing so, social workers need to be aware of the potential trade-off between following medical recommendations that advocate for a strict lifestyle and patients' QoL.

KEY WORDS: *disease management; illness representations; patient–physician relationships; quality of life; subjective well-being*

Diabetes has long been acknowledged as a biopsychosocial disease (DeCoster, 2001). Diabetes management involves a dramatic change in lifestyle, including keeping a low-sugar diet, maintaining an exercise regime, monitoring daily blood sugar, and taking oral medications or insulin supplements. Social workers are in a unique position to help patients with diabetes maintain a healthy lifestyle and negotiate the medical world (Amir, Rabin, & Galatzer, 1990; DeCoster & Cummings, 2005; Gross et al., 2007). Knowledge of the specific factors that affect one's quality of life (QoL) is of utmost importance to social workers for the development and implementation of future interventions that would help patients with diabetes manage their condition (Claiborne & Massaron, 2000). Because the QoL of diabetic patients is affected by many variables, which are not all related to diabetes, it is particularly important to ask patients about their QoL in the hypothetical absence of diabetes and not only about their subjective general QoL. The

former gives information about the perceived effect diabetes has on one's QoL.

QoL has captured an increasing role in medical literature. Research has shown that QoL is a risk factor for longer and more complicated hospital stays, poor adherence to medical treatment, and increased morbidity and mortality (Fan, Curtis, Tu, McDonell, & Fihn, 2002; Jacobson, Wu, & Feinberg, 2003; Rumsfeld et al., 1999; Westin, Nilstun, Carlsson, & Erhardt, 2005). As a result, it is no longer acceptable to evaluate only the biophysiological indicators of the disease, rather a comprehensive evaluation that takes into consideration QoL is indicated (Rubin & Peyrot, 1999).

Diabetes has been associated with low QoL that tends to decline over the years (Brown et al., 2004; Hart, Redekop, Berg, Bilo, & Meyboom-de Jong, 2005). Several studies have identified demographic and clinical characteristics, illness representations, and health behaviors associated with QoL in patients with diabetes. For example, all of the following have

been associated with lower QoL in patients with diabetes: lower socioeconomic status (Wandell, 2005), medical comorbidity, diabetes-related complications and symptoms (Davis et al., 2005; De Berardis et al., 2002; Hart et al., 2005; Vileikyte, 2001; Wandell, 2005;), higher body mass index (BMI) (Maddigan, Majumdar, & Johnson, 2005), pain, depression (Lustman & Clouse, 2005; Paschalides et al., 2004), anxiety (Paschalides et al., 2004), lower perceived sense of control over diabetes (Paschalides et al., 2004), lower self-efficacy (Rose, Fliege, Hildebrandt, Schirop, & Klapp, 2002), pessimism (Rose et al., 2002), nonadherence to an exercise regime (Glasgow, Ruggiero, Eakin, Dryfoos, & Chobanian, 1997; Smith & McFall, 2005), and poor continuity of care (Wandell, 2005).

These studies provide important information about potential determinants of QoL in patients with diabetes. However, the majority of these studies did not evaluate a large set of predictors simultaneously to better determine the relative importance of each predictor. Furthermore, potential predictors of QoL such as knowledge of diabetes care or satisfaction with medical services have not been adequately evaluated in past research. In addition, only very few studies have asked people directly about the subjective effect of diabetes on their QoL (that is, perceived QoL in the hypothetical absence of diabetes) (Bradley & Speight, 2002; Bradley et al., 1999). This question is important because it evaluates the specific effect of diabetes on one's QoL rather than a general perception of QoL. In contrast to past research, the present study evaluates a large array of potential predictors of QoL and perceived QoL in the hypothetical absence of diabetes in a sample of primary care patients with diabetes. This study also has the advantage of being conducted in Israel, a country that has a universal health care system. Thus, we do not expect QoL to be affected by socioeconomic or access issues. Instead, we expect daily factors associated with the management of diabetes to be associated with lower QoL. We also expect subjective health and mental health to be the strongest predictors of QoL because of the relatively symptomatic nature of diabetes.

METHOD

This is a secondary data analysis of a study funded by the Israeli National Institute for Health Policy and Health Services Research to assess adherence

to diabetes and hypertension guidelines by primary care physicians. The study was approved by the Institutional Review Board of Haemek Hospital.

The Study Population

The primary sampling unit included community-based primary care physicians who were affiliated with the two largest health plans in Israel (Clalit Health Services and Maccabi Health Services), insuring over 80 percent of the population. From each physician, we sampled a representative group of patients with diabetes, hypertension, or both. A total of 1,369 participants with diabetes, hypertension, or both completed the patient questionnaire (77 percent response rate). Each participant was assigned a weight based on the probability of being sampled, corrected to reflect the health plan's composition of patients with hypertension, diabetes, or both conditions. The secondary data analysis presented in this article is based on 400 weighted cases of patients with diabetes type 2. We do not report in this analysis data on individuals diagnosed only with hypertension.

Data Collection

Between December 2002 and June 2003, trained interviewers conducted telephone interviews of patients with diabetes using structured questionnaires. The interviews lasted approximately 20 minutes; questionnaires were available in Hebrew, Arabic, and Russian.

Measures

All measures are based on patients' self-report. All measures were validated before their use in the present study. Measures were extensively evaluated for face and construct validity in a pilot study with diabetes patients (see Gross et al., 2003). Face validity was established by review of the questions by four physicians and four health scientists from the Myers-JDC-Brookdale Institute. All have vast experience in conducting care surveys. To establish construct validity of the measures, a pretest with 135 patients with diabetes was conducted (Gross, 2001).

Outcome Variables

QoL was examined by the question "How would you define your overall quality of life?" Response options were very good = 5, good = 4, mediocre = 3, bad = 2, and terrible = 1. This variable followed a

normal distribution. (Note that single-item measures of health, quality of life satisfaction, and so forth are routinely used in population surveys in which health is only one among many issues measured and that have to be covered in a short interview; Wilkin, Hallam, & Doggett, 1991.)

We also evaluated the perceived effect that diabetes had on patients' QoL using a question about QoL in the hypothetical absence of diabetes. Perceived QoL in the hypothetical absence of diabetes was examined by the following question: "If you did not suffer from diabetes, how would your overall quality of life have been?" Response options were much better = 5, somewhat better = 4, exactly the same = 3, worse = 2, and much worse = 1. Because this variable was positively skewed with the majority of participants stating that their perceived QoL in the absence of diabetes would have been much better or somewhat better, it was dichotomized; those endorsing the response options much better or somewhat better were grouped under a single value representing improvement (1), and those endorsing the response options exactly the same, worse, or much worse were grouped under a single value that signifies no change or worse (0).

Predictors

Sociodemographic Information. We evaluated gender (male = 1, female = 0), age, marital status (married = 1, not married = 0), place of birth (Israel = 1, outside of Israel = 0), work status (employed = 1, unemployed = 0), education (did not complete elementary school = 0, no schooling at all = 1, elementary school/middle school = 2, high school education = 3, some college/university = 4), and difficulties meeting basic needs (very difficult = 1, somewhat difficult = 2, no difficulty = 3).

Medical Complications. We evaluated presence of high cholesterol (yes = 1, occasionally = 2, no = 3), balanced glucose level (yes = 1, occasionally = 2, no = 3), diabetes-related complications (yes = 1, no = 0), and BMI.

Subjective Health and Mental Health. We evaluated subjective health status (excellent = 5, very good = 4, good = 3, mediocre = 2, very bad, = 1) and the presence of emotional distress (yes = 1, no = 0). Emotional distress was measured using the following question: "During the past year, have you experienced emotional distress, (for example, depression, anxiety, tension, great sadness), which you

found difficult to cope with by yourself?" Possible responses were yes or no. This question was similar to the perceived need screening question used in the U.S. national comorbidity survey (Kessler et al., 1997) and the Mental Health Supplement of the Ontario Health Survey (Lin, Goering, Offord, Campbell, & Boykem, 1996). It was used in Israel in previous surveys in which construct validity was ascertained (Gross, Feldman, Rabinowitz, & Grinstein, 1998; Rabinowitz, Gross, & Feldman, 1999; Rabinowitz, Gross, & Feldman, 2003).

Health Behaviors. We evaluated whether participants were physically active (yes = 1, no = 0), followed a special food and/or drinking diet (lower score indicating a stricter regime, range = 0 to 4), regular diabetes self-care (for example, foot care, glucose checks, and regular doctor appointments; higher score indicating greater care, range = 0 to 3), and pharmaceutical treatment related to diabetes care (pills, injections, or both = 1; none = 0).

Health Beliefs and Knowledge. To evaluate diabetes-related knowledge, we used five questions concerning the potential effect of diabetes on blood vessels and feet and the effects of diet, physical activity, and weight management on diabetes management (higher score indicates better diabetes knowledge, range = 0 to 5). Perceived ability to control diabetes was evaluated by the following statements: "Diabetes medicine can help me feel better," "A diet can help me feel better," "It is important to adhere to diabetes treatment," and "My diabetes can be under control" (higher score indicates greater beliefs in the ability to control diabetes, range = 0 to 4).

Quality of Medical Care. We used six questions about the level of medical explanation regarding diabetes complications, appropriate diet, foot care, eye check, diabetes care, and the importance of carrying a diabetes identification card (higher score represents more explanations provided by medical staff, range = 0 to 6). We evaluated whether care was provided according to guidelines by asking participants about having a physical exam, foot check, electrocardiogram, dietician services, and eye check within the past year (higher score represents greater adherence to guidelines of care, range = 0 to 5). We evaluated satisfaction with diabetes care using the following two statements: "My diabetes could have been managed in a better way" and "I am confused by instructions given by medical personnel" (higher score indicates greater satisfaction, range = 0 to 2).

Statistical Analysis

To examine potential predictors of QoL, we conducted Spearman's correlation. To examine potential predictors of perceived QoL in the hypothetical absence of diabetes, we conducted *t*-test analyses in the case of continuous variables and chi-square analyses in the case of categorical variables. All variables significant at the .05 level were examined for multicollinearity and then entered into multivariate regression models; we conducted an ordinal regression with QoL as an outcome variable and a logistic regression with QoL in the hypothetical absence of diabetes as an outcome variable.

RESULTS

Overall, 74.9 percent of the sample was married. Men constituted 55.7 percent of the sample. A total of 60.9 percent had elementary or high school education. Overall, 22.8 percent reported that it is very difficult for them to meet basic needs, 32.6 percent reported that they suffer from high cholesterol, 19.6 percent reported that they suffer from diabetes-related complications, and 32.2 percent reported that they suffer from emotional distress. A total of 69.7 percent reported that their QoL was very good or good, and 71.2 percent reported that their QoL would have improved in the hypothetical absence of diabetes.

QoL

In bivariate analyses, higher QoL was associated with higher levels of education ($r = .11, p < .05$). Higher QoL was also associated with fewer difficulties meeting basic needs ($r = .36, p < .01$), no medical complications related to diabetes ($r = -.23, p < .01$), a balanced glucose level ($r = -.16, p < .01$), and lower BMIs ($r = -.21, p < .01$). In addition, better subjective health status ($r = .54, p < .01$), the absence of emotional distress ($r = .28, p < .01$), and being physically active ($r = .14, p < .01$) were all associated with higher QoL. Perceived ability to control diabetes ($r = .14, p < .01$) and greater satisfaction with medical care ($r = .25, p < .01$) also were associated with higher QoL. There was no evidence for multicollinearity. Multivariate analysis revealed that relative to those who reported having difficulties meeting basic needs, those who reported having no such difficulties also reported higher QoL. Those who reported more diabetes-related complications and worse subjective health were more likely to report worse QoL. In addition,

Table 1: Multivariate Analysis of Predictors of Quality of Life (N = 400)

Predictor	B	SE B
Demographics		
Education		
(Did not complete/no schooling at all)		
Elementary school/middle school	-.33	.24
High school education	-.26	.23
Some college	-.15	.35
University	.57	.30
Difficulty meeting basic needs		
(Very difficult)		
Somewhat difficult	-.10	.19
No difficulty	.58**	.20
Health Status		
Diabetes-related complications		
(No)		
Yes	-1.10**	.33
BMI	-.003	.008
Subjective Health Status		
Self-rating		
(Very bad)		
Mediocre	.31	.42
Good	.73**	.28
Very good	-.67**	.26
Excellent	-2.33**	.37
Emotional distress		
(No)		
Yes	-.23	.30
Health Behaviors		
Physical activity		
(No)		
Yes	-.42	.28
Knowledge and Beliefs		
Perceived ability to control diabetes	.38	.21
Satisfaction with diabetes treatment	.67**	.20

Notes: Reference categories are in parentheses. BMI = body mass index. Ordinal regression analysis was conducted to evaluate predictors of quality of life [$\chi^2(18) = 125.75, p < .0001$].

** $p < .01$.

dissatisfaction with medical care was associated with worse QoL [$\chi^2(18, N = 233) = 125.75, p < .001$]. (See Table 1.)

QoL in the Hypothetical Absence of Diabetes

In bivariate analyses, reporting a potential improvement in one's QoL in the hypothetical absence of

diabetes was associated with being younger [$t(359) = -2.67, p < .05$] and with having greater difficulties meeting basic needs [$\chi^2(2, N = 363) = 10.79, p < .01$]. In addition, reporting an imbalanced cholesterol level [$\chi^2(2, N = 355) = 10.38, p < .01$], reporting diabetes-related complications [$\chi^2(1, N = 366) = 7.24, p < .01$], reporting an imbalanced glucose level [$\chi^2(2, N = 346) = 7.29, p < .05$], and reporting poorer subjective health status [$\chi^2(4, N = 363) = 23.10, p < .01$] all were associated with a potential improvement in QoL in the hypothetical absence of diabetes. Last, reporting greater adherence to diabetes diet [$t(363) = -4.17, p < .01$], reporting more regular diabetes care [$t(364) = 4.84, p < .01$], reporting the use of medical treatment related to diabetes [$\chi^2(1, N = 367) = 17.20, p < .01$], and having better diabetes knowledge [$t(364) = 2.87, p < .01$] were associated with a potential improvement in QoL in the hypothetical absence of diabetes. There was no evidence for multicollinearity. In multivariate analysis, those who reported difficulties meeting basic needs were significantly more likely to report better QoL in the hypothetical absence of diabetes. Those of higher cholesterol level and worse subjective health status also were significantly more likely to report better QoL in the hypothetical absence of diabetes. Diabetes management played a major role in the effect that diabetes has on an individual's QoL; engaging in stricter diabetes self-care and taking pharmaceutical treatment for managing diabetes were associated with better QoL in the hypothetical absence of diabetes [$\chi^2(16) = 78.88, p < .001$]. (See Table 2.)

DISCUSSION

The present study evaluated QoL and QoL in the hypothetical absence of diabetes by using a large and representative sample of patients with diabetes. As expected, those who reported suffering from medical complications and having worse health status also reported worse QoL. This finding provides further support to the validity of our QoL measures. It is interesting to note that having difficulties meeting basic needs was a significant predictor of both QoL and QoL in the hypothetical absence of diabetes. Given that Israel has a national health care system, it is of particular interest that income still has such an important impact on all aspects of an individual's QoL.

It was unexpected that engaging in stricter diabetes self-care and taking pharmaceutical treatment

Table 2: Multivariate Analysis of Predictors of Quality of Life in the Hypothetical Absence of Diabetes (N = 400)

Predictor	OR	95% CI
Demographics		
Age	.99	.96–1.03
Difficulty meeting basic needs		
(Yes)		
Somewhat difficult	.48	.20–1.19
No difficulty	.33	.14–.76**
Health Status		
High cholesterol level		
(Yes)		
Occasionally	.54	.17–1.70
No	.46	.24–.90*
Balanced glucose level		
(Yes)		
Occasionally	.66	.46–1.64
No	.22	.70–4.28
Diabetes-related complications		
(Yes)		
No	1.32	.59–2.99
Subjective Health Status		
Self-rating		
(Very bad)		
Mediocre	.61	.23–1.59
Good	.96	.35–2.65
Very good	.30	.08–1.06
Excellent	.05	.01–.46**
Health Behaviors		
Diabetes diet		
(Yes)		
No	.81	.64–1.02
Regular diabetes care	2.07	1.46–2.94**
Pharmaceutical treatment related to diabetes care		
(No)		
Yes	2.74	1.076.99*
Knowledge and Beliefs		
Diabetes knowledge	1.21	.91–1.60

Notes: Reference categories are in parentheses. $\chi^2(16) = 78.88, p < .001$. OR = odds ratio. CI = confidence interval.

* $p < .05$. ** $p < .01$.

for managing diabetes were associated with better QoL in the hypothetical absence of diabetes but not with an individual's QoL. These findings emphasize the trade-off between following a strict lifestyle as advocated by current medical thinking and an individual's QoL. Our findings demonstrate the high

Social workers can assist patients with diabetes in their adjustment to lifestyle changes by providing them with supportive medical services, psychosocial counseling, and self-help groups.

toll diabetes management takes on an individual's QoL. Regular checkups for potential complications of diabetes and the use of pharmacological measures are often considered necessary ingredients for the successful management of diabetes. Yet the present study highlights a noteworthy conflict related to diabetes management by showing that strictly adhering to medical guidelines for the treatment of diabetes hampers the individual's QoL. Thus, patients may prefer to compromise their health and risk future complications to improve their QoL in the short-term. Our findings are in line with previous studies that highlight the difficulties patients with diabetes report in adopting appropriate lifestyle behaviors (Anderson et al., 2003; Hall, Joseph, & Schwartz-Barcott, 2003), as these behaviors often are disruptive and require patients to be highly motivated. Moreover, patients with diabetes may feel stigmatized by the management of their condition (for example, the need to inject and to maintain a special diet), and this may lead to further impairment in their QoL (Broom & Whittaker, 2004; DeCoster, 2003). Our findings suggest that when working with patients with diabetes, social workers should adapt an ecological approach that takes into consideration the patient's psychosocial and medical needs as well as the overall social environment (McLeroy, Bibeau, Steckler, & Glanz, 1988).

The finding that dissatisfaction with medical services is associated with worse QoL is understandable given that successful diabetes management requires close relationship with medical services. Thus, to improve the QoL of diabetes patients, social workers should be aware of the need to counsel patients and assist them in overcoming bureaucracy and other problems they may encounter with medical services (Gross et al., 2007).

LIMITATIONS

First, QoL and perceived QoL in the hypothetical absence of diabetes were each evaluated by a single question. However, research has shown that

a single question is adequate for the evaluation of QoL (Ayalon et al., 2006; Bernhard, Sullivan, Hurny, Coates, & Rudenstam, 2001; de Boer et al., 2004). In addition, some may question the validity of evaluating one's QoL in the hypothetical absence of diabetes because of the hypothetical aspect of this question. However, both our pilot study and this study found that in addition to face validity, the QoL questions also have high construct validity. Furthermore, research has consistently shown that asking patients about their QoL in the hypothetical absence of the disease provides meaningful information (Ayalon et al., 2006; Bradley & Speight, 2002; Bradley et al., 1999). Second, the study did not include biological markers of diabetes and did not evaluate physicians' perceptions of patients' conditions. A more comprehensive approach that takes into consideration biological markers and physicians' perception may provide important insights. However, it is important to note that subjective evaluation of an individual's own health status is considered one of the best indicators of mortality and morbidity (Idler & Kasl, 1991). Last, the cross-sectional nature of the design prohibits conclusions about cause and effect.

IMPLICATIONS FOR SOCIAL WORKERS

In recent years, researchers have called for increased cooperation between medicine and social work (Wendt, 1990) in the management of diabetes (Gross et al., 2007). The implications of this study suggest that attempts to improve the QoL of patients with diabetes should follow an ecological approach for health promotion by focusing on the individuals within the social and medical context (McLeroy et al., 1988). Social workers are in a unique position because they can assist patients with diabetes in their adjustment to lifestyle changes by providing them with supportive medical services, psychosocial counseling, and self-help groups (Wendt, 1990). When doing so, social workers need to be aware of the potential trade-off between following medical recommendations that advocate for a strict lifestyle and patients' QoL. This may improve patients' adherence to diabetes management recommendations and as a result improve patients' medical conditions, reduce diabetes-related complications, and reduce health care expenditures (Amos, McCarty, & Zimet, 1997; Goldfracht & Porath, 2000). Social workers can further assist medical personnel in negotiating

these changes with patients (Gross et al., 2007). Furthermore, because of their knowledge of public policy and community work, social workers can help integrate appropriate health behaviors into the public notion (McLeroy et al., 1988; Wendt, 1990). Finally, as part of a comprehensive approach toward the management of diabetes, the questions used in the present study to measure QoL and perceived QoL in the hypothetical absence of diabetes could be used to screen patients and assist those with lower QoL to better cope with the demands of diabetes management. **HSW**

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