

CORRELATES OF QUALITY OF LIFE IN PRIMARY CARE PATIENTS WITH HYPERTENSION*

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ABSTRACT

Background: Hypertension has been associated with lower levels of quality of life (QoL). However, the specific correlates of lower QoL in this patient population have remained largely unclear. *Methods:* A cross-sectional design of 1,125 primary care patients with hypertension. We evaluated demographics, health status, subjective health and mental health, health behaviors, health beliefs, knowledge of hypertension treatment, satisfaction with medical care, and quality of medical care as potential predictors of QoL

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and perceived QoL in the hypothetical absence of hypertension. *Results:* Worse financial status, poorer blood pressure control, worse subjective health, mental distress, lack of hypertension diet, and irregular hypertension care were all associated with worse QoL. Worse financial status, poorer blood pressure control, higher body mass index, mental distress, and following a hypertension diet were associated with better QoL in the hypothetical absence of hypertension. *Conclusions:* In addition to taking into consideration well known determinants of QoL, such as financial status, health status, and mental health, physicians need to be aware of the potential tradeoff between following medical recommendations that advocate for a strict diet and the impact these have on patients' QoL. Physicians also need to be aware of the effect of imparting information regarding imbalanced blood pressure on perceived QoL.

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Key Words: subjective well being, illness representations, knowledge, disease management, health status, health behaviors, satisfaction with medical care

Quality of life (QoL) has been shown to be a risk factor for longer and more complicated hospital stay, poorer adherence to medical treatment, and increased morbidity and mortality [1-4]. Thus, it is highly important to take into consideration one's QoL as part of the comprehensive management of a disease [5]. Hypertension (HTN) is an asymptomatic condition at low and moderate levels. Therefore, there has been a debate over the impact of hypertension on QoL. Some have argued that the presence of hypertension has no impact [6], whereas others have shown that hypertension is associated with lower QoL [7-9]. Specifically, research has shown that uncontrolled blood pressure [9], hypertension complications and symptoms [10-12], antihypertensive medications' side effects [12], and being labeled as suffering from hypertension [9, 13, 14] all are associated with lower QoL.

These studies provide preliminary information about potential determinants of QoL in patients with hypertension. However, the majority of these studies did not evaluate psychosocial predictors of QoL, such as knowledge of hypertension care or satisfaction with medical services, but instead focused on biomedical determinants of QoL. In addition, none of the studies has asked people directly about the subjective impact of hypertension over their QoL (i.e., perceived QoL in the hypothetical absence of hypertension). The present study, in contrast, evaluates a large array of potential predictors of QoL and perceived QoL in the hypothetical absence of hypertension in a sample of hypertensive primary care patients. Because of the asymptomatic nature of hypertension, we hypothesized that psychosocial aspects, such as knowledge of disease management, assignment

of responsibility for hypertension care, and satisfaction with medical care would play a large role in determining patients' QoL.

METHODS

The Study Population

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

The study population included all 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% of the population. A representative sample of 997 physicians was drawn after stratifying for specialty (general practitioners versus specialists in family medicine, internal medicine or another specialty) and terms of employment (salaried versus independent physicians). Of these, 743 physicians were interviewed, yielding a response rate of 78%. Each physician was assigned a weight based on the probability of being sampled.

Patient population included 1,775 patients with hypertension and/or diabetes listed with these primary care physicians (from half of the physicians, we sampled patients with diabetes and from half patients with hypertension). A total of 1,369 participants completed the patient questionnaire (77% 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 diseases. The secondary data analysis presented in this article is based on the 1,125 weighted cases of patients with hypertension.

Data Collection

Between December 2002 and June 2003, telephone interviews were conducted with patients suffering from hypertension using structured questionnaires, to assure understanding of questions and reduce missing data. The interviews lasted an average of 20 minutes, and were conducted by trained interviewers. The questionnaires were translated into Russian and Arabic to include significant segments of Israel's population that do not speak Hebrew fluently.

Measures

Outcome Variables

QoL was examined by the question "how would you define your overall quality of life." Response options were "very good," "good," "mediocre," "bad,"

“terrible.” Because this variable was positively skewed, with the majority of participants stating that their QoL was very good, good, or mediocre, we dichotomized this variable to those endorsing the values very good and good (1) versus all others (0).

Perceived QoL in the hypothetical absence of hypertension was examined by the question “if you did not suffer from hypertension, how would your overall quality of life have been.” Response options were “much better,” “somewhat better,” “exactly the same,” “worse,” “much worse.” Because this variable was positively skewed with the majority of participants stating that their perceived QoL in the absence of hypertension 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 that signifies “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, age, place of birth (Israel versus outside of Israel), work status (employed versus unemployed), education (elementary school or less versus more than elementary school), and difficulties meeting basic needs, such as buying food products, paying household bills, etc.

Health status—We evaluated the presence of well-controlled blood pressure, hypertension related complications, and body mass index (BMI).

Subjective health and mental health—We evaluated subjective health status and the presence of mental distress.

Health behaviors—We evaluated whether the participant was physically active, followed a special hypertension diet (e.g., caloric restriction, no salty foods, etc.), regular hypertension self-care (e.g., regular medical follow-ups, regular blood checks) (higher score indicates greater care), and pharmaceutical treatment related to hypertension care.

Health beliefs and knowledge—In order to evaluate hypertension related knowledge, we used five questions concerning the potential impact of hypertension and its management (e.g., imbalanced blood pressure can cause a heart attack or stroke; being overweight has no effect on blood pressure; consumption of salty foods can cause hypertension; physical activity can help balancing blood pressure; pharmaceutical treatment is sufficient for keeping blood pressure under control) (higher score indicates better hypertension knowledge). We evaluated perceived responsibility for hypertension care as being primarily of the patient versus primarily of medical team.

Quality of medical care—We used seven questions to assess whether or not participants received explanations from medical staff regarding hypertension complications, appropriate diet and body weight, hypertension management, and hypertension medications (higher score represents more explanations provided by medical staff). We evaluated satisfaction with hypertension care (higher score representing greater satisfaction).

Statistical Analysis

Analyses were conducted using SPSS Version 13.0 computer package. We first ran descriptive statistics. Then, for each outcome separately, we conducted chi-square analyses in the case of categorical predictors and *t*-test analyses in the case of continuous predictors. All variables significant at the .05 level were examined for multicollinearity and then entered into multivariate logistic regression models as potential predictors of QoL and perceived QoL in the hypothetical absence of hypertension.

RESULTS

Demographic and clinical characteristics of the sample are summarized in Table 1. The sample consisted of equal numbers of males and females with the majority having an education of elementary school or less (63.4%). The average age of the sample was 72. The majority of the sample reported that their QoL was very good or good (78.3%) and that their QoL would not have improved in the hypothetical absence of hypertension (53.4%).

Bivariate analyses indicated significant associations between QoL and employment status, level of education, financial status, hypertension complications, balanced blood pressure, subjective health status, mental distress, physical activity, hypertension diet, regular hypertension care, hypertension knowledge, responsibility for hypertension care, level of explanation from medical team, and satisfaction with medical care (Table 2). There was no evidence of multicollinearity among potential predictors. Multivariate analysis revealed that greater difficulties meeting basic needs, poorly controlled blood pressure, worse subjective health, the presence of mental distress, not following a hypertension diet, and irregular hypertension care are associated with worse QoL. See Table 3 for details.

In bivariate analyses, we found significant associations between QoL in the hypothetical absence of hypertension and level of education, financial status, hypertension related complications, well-controlled blood pressure, body mass index (BMI), subjective health status, mental distress, physical activity, hypertension diet, pharmaceutical treatment related to hypertension, hypertension knowledge, responsibility for hypertension care, and level of explanation from medical team. See Table 4 for details. There was no evidence of multicollinearity.

Table 1. Demographic and Clinical Characteristics of the Sample

Variable	Value N = 1,125
<i>Outcome variables</i>	
QoL excellent, very good	768 (78.3)
QoL in the hypothetical absence of HTN stays the same or worse	600 (53.4)
<i>Demographic predictors</i>	
Female	565 (50.2)
Age	72.03 (10.05)
Born in Israel	478 (42.5)
Unemployed in the past three months	353 (31.4)
Elementary school or less	713 (63.4)
Difficulty meeting basic needs	
Very difficult	126 (11.2)
Somewhat difficult	255 (22.7)
No difficulty	631 (56.1)
<i>Health status predictors</i>	
HTN related complications	88 (7.8)
Balanced blood pressure	
Yes	729 (64.8)
Occasionally	210 (18.7)
No	111 (9.9)
BMI	28.36 (5.65)
<i>Subjective health status predictors</i>	
Subjective health status excellent, very good, or good	697 (61.9)
Mental distress	254 (22.5)
<i>Health behaviors predictors</i>	
Physically active	537 (47.7)
HTN diet	
Yes	500 (44.5)
Occasionally	230 (20.4)
No	379 (33.7)
Regular HTN care	.62 (.33)
Pharmaceutical treatment related to HTN	1008 (89.7)
<i>Knowledge and beliefs predictors</i>	
HTN knowledge	.77 (.25)
Responsibility for HTN care only or primary of patient	794 (70.6)
<i>Satisfaction and perceived quality of medical care predictors</i>	
Level of explanation from medical team	3.48 (2.12)
Satisfaction with medical care	.104 (1.63)

Values are reported as mean (standard deviation) for continuous variables and frequency (percentage) for categorical variables.

In multivariate analysis, greater difficulties meeting basic needs, imbalanced blood pressure, higher BMI, higher levels of mental distress, and following a hypertension diet were associated with better QoL in the hypothetical absence of hypertension. See Table 5.

DISCUSSION

The present study is unique because, in contrast to previous research that concentrated primarily on biological determinants of QoL, such as medication side effects or hypertension complications, this study evaluates a variety of cognitive-affective predictors of QoL. As expected, worse financial situation, poorly controlled blood pressure, worse subjective health, and mental distress were associated with lower QoL. Interestingly, however, following a suitable hypertension diet was associated with better QoL as well as with better QoL in the absence of hypertension. This suggests that a tradeoff exists between following a strict life style as advocated by current medical thinking and one's QoL. No doubt, following a hypertension diet is likely to improve one's QoL, but at the same time, it may also have an adverse impact over one's QoL in the short term (i.e., QoL in the hypothetical absence of hypertension). Those who do not follow a hypertension diet may compromise their health and risk future cardio vascular and other complications in order to improve their QoL in the short run. We found a similar tradeoff in a sample of diabetic patients [15].

We also found that a higher BMI was associated with better QoL in the hypothetical absence of hypertension, but had no association with overall QoL. While some have argued that being over weight and having a higher BMI are associated with worse QoL[16], there is a general notion that increased weight does not impair happiness or QoL[17, 18]. Our study demonstrates that while it has no impact on one's QoL, it does impair QoL in the hypothetical absence of hypertension, as these individuals probably are required to change their life style once hypertension is detected.

In contrast to our expectations, we did not find a relationship between knowledge and beliefs about hypertension and QoL or a relationship between satisfaction with medical care and QoL. This may be due to the fact that hypertension is a relatively asymptomatic condition that does not require intensive medical care. Thus, while financial status, health status, and mental health all impact one's QoL in both hypertensive and non-hypertensive samples [19, 20], factors that are more specifically related to hypertension, such as satisfaction with medical care or knowledge of hypertension management and consequences, do not play a role in this patient population. As stated before, the one very unique factor that did show a relationship with QoL and QoL in the hypothetical absence of hypertension was following a specific hypertension diet.

Another interesting association should be noted—lower QoL and higher expected QoL in the absence of hypertension were experienced by patients who

Table 2. Bivariate Analysis of Potential Predictors of Quality of Life

Categorical predictors	Poor N (%)	Good N (%)	p Value
<i>Demographics</i>			
Employment			<.0001
Employed	70 (24.1)	279 (36.5)	
Unemployed	221 (75.9)	486 (63.5)	
Education			<.0001
Elementary school or less	222 (76.3)	474 (62.2)	
More than elementary school	69 (23.7)	288 (37.8)	
Meeting basic needs			<.0001
Very difficult	74 (26.8)	51 (7.1)	
Somewhat difficult	86 (31.2)	161 (22.3)	
No difficulty	116 (42)	510 (70.6)	
<i>Health Status</i>			
HTN related complications			<.0001
Yes	243 (84.4)	716 (94.3)	
No	45 (15.6)	43 (5.7)	
Balanced blood pressure			<.0001
Yes	132 (49.6)	566 (75.4)	
Occasionally	70 (26.3)	138 (18.4)	
No	64 (24.1)	47 (6.3)	
<i>Subjective Health Status</i>			
Subjective health status			<.0001
Generally good	89 (31.4)	573 (76.2)	
Bad	194 (68.8)	179 (23.8)	
Mental distress			<.0001
Yes	126 (43.4)	110 (14.5)	
No	164 (56.6)	649 (85.5)	
<i>Health Behaviors</i>			
Physically active			<.0001
Yes	90 (31)	412 (53.6)	
No	200 (69)	356 (46.4)	

Table 2. (Cont'd.)

Categorical predictors	Poor <i>N</i> (%)	Good <i>N</i> (%)	<i>p</i> Value
HTN diet			<.0001
No	137 (47.2)	216 (28.1)	
Occasionally	50 (17.2)	176 (22.9)	
Yes	103 (35.5)	376 (49)	
<i>Knowledge and Beliefs</i>			
Responsibility for HTN care			.001
Primarily of patient	189 (71.1)	595 (80.5)	
Primarily of medical team	77 (28.9)	144 (19.5)	
Continuous predictors	Poor <i>M</i> (Std)	Good <i>M</i> (Std)	<i>p</i> Value
<i>Health Behaviors</i>			
Regular HTN care	.51 (.34)	.66 (.32)	<.0001
<i>Knowledge and Beliefs</i>			
HTN knowledge	.81 (.23)	.69 (.27)	<.0001
<i>Satisfaction and Perceived Quality of Medical Care</i>			
Level of explanation from medical team	3.42 (2.063)	3.73 (2.24)	.036
Satisfaction with medical care	.908 (1.51)	1.31 (1.83)	<.0001

Only significant predictors are reported. Chi square analyses were conducted for categorical variables and *t*-test analyses for continuous variables.

reported that their blood pressure was not well balanced. This condition, usually does not involve physical symptoms and, therefore, the decreased QoL may be explained by the mental burden of this medical information that may trigger concerns about future adverse effects. Future research that employs a more in-depth qualitative approach may better explain this finding.

Limitations

First, QoL and perceived QoL in the hypothetical absence of hypertension were each evaluated by a single question. Research has shown that a single question is adequate for the evaluation of QoL [21, 22], but some may argue that a more comprehensive scale could potentially improve the evaluation of QoL.

Table 3. Multivariate Analysis of Predictors of QoL

Predictors of QoL	OR	95% CI	p
<i>Demographics</i>			
Employment	1.41	.86-2.305	.16
Education	1.26	.77-2.074	.34
Meeting basic needs			.13
Somewhat difficult	1.57	.86-2.88	<.0001
No difficulty	3.21	1.83-5.62	
<i>Health Status</i>			
HTN related complications	.53	.28-1.033	.063
Balanced blood pressure			.070
Occasionally	.66	.42-1.035	.003
No	.408	.22-.73	
<i>Subjective Health Status</i>			
Subjective health status	4.903	3.25-7.39	<.0001 .007
Mental distress	.55	.35-.84	
<i>Health Behaviors</i>			
Physically active	1.42	.94-2.15	.088
HTN diet			.59
Occasionally	.85	.49-1.49	<.0001
Yes	2.44	1.54-3.85	
Regular HTN care	2.33	1.27-4.26	.006
<i>Knowledge and Beliefs</i>			
HTN knowledge	1.17	.47-2.89	.72
Responsibility for HTN care	1.13	.707-1.82	.59
<i>Satisfaction and Perceived Quality of Medical Care</i>			
Level of explanation from medical team	.93	.84-1.034	.19
Satisfaction with medical care	1.12	.96-1.29	.12

Logistic regression was conducted to evaluate predictors of QoL ($\chi^2 (17) = 270.45$, $p < .0001$).

Table 4. Bivariate Analysis of Potential Predictors of Quality of Life in the Absence of Hypertension

Categorical predictors	Poor N (%)	Good N (%)	p Value
<i>Demographics</i>			
Education			<.0001
Elementary school or less	377 (63.7)	384 (70.6)	
More than elementary school	215 (36.3)	118 (29.4)	
Meeting basic needs			<.0001
Very difficult	40 (7)	84 (22.8)	
Somewhat difficult	121 (21.3)	113 (30.6)	
No difficulty	408 (71.7)	172 (46.6)	
<i>Health Status</i>			
HTN related complications			<.0001
Yes	28 (4.8)	48 (12)	
No	561 (95.2)	353 (88)	
Balanced blood pressure			<.0001
Yes	426 (74.3)	240 (60.9)	
Occasionally	104 (18.2)	92 (23.4)	
No	43 (7.5)	62 (15.7)	
<i>Subjective Health Status</i>			
Subjective health status			<.0001
Generally good	419 (70.3)	207 (54)	
Bad	177 (29.7)	176 (46)	
Mental distress			<.0001
Yes	88 (14.9)	131 (32.7)	
No	503 (85.1)	270 (67.3)	
<i>Health Behaviors</i>			
Physically active			.002
Yes	308 (51.3)	166 (41.4)	
No	292 (48.7)	235 (58.6)	
HTN diet			<.0001
No	232 (38.6)	103 (25.7)	
Occasionally	130 (21.6)	85 (21.2)	
Yes	239 (39.8)	213 (53.1)	

Table 4. (Cont'd.)

Categorical predictors	Poor <i>N</i> (%)	Good <i>N</i> (%)	<i>p</i> Value
Pharmaceutical treatment			.003
Yes	540 (90)	383 (95.3)	
No	60 (10)	19 (4.7)	
<i>Knowledge and Beliefs</i>			
Responsibility for HTN care			<.0001
Primarily of patient	473 (82.4)	268 (70.7)	
Primarily of medical team	101 (17.6)	111 (29.3)	
Continuous predictors	Poor <i>M</i> (Std)	Good <i>M</i> (Std)	<i>p</i> Value
<i>Health Status</i>			
BMI	28.023 (6.092)	29.29 (5.17)	.002
<i>Knowledge and Beliefs</i>			
HTN knowledge	.79 (26)	.75 (.22)	.16
<i>Satisfaction and Perceived Quality of Medical Care</i>			
Level of explanation from medical team	3.69 (2.16)	3.067 (1.99)	<.0001

Only significant predictors are reported. Chi square analyses were conducted for categorical variables and *t*-test analyses for continuous variables.

Our findings, however, demonstrate that in addition to face validity, QoL questions used in the study have excellent construct validity. Second, in contrast to previous studies, this study did not ask participants to specifically identify hypertension complications, but instead, asked a general question about the presence of hypertension complications. This was done primarily because the focus of this article was on psychosocial variables and not on biomedical variables that contribute to QoL. Last, the cross-sectional nature of the design prohibits conclusions about cause and effect.

To sum, the uniqueness of the present study is its focus on psychosocial variables that contribute to the QoL of patients who suffer from hypertension. In addition to well-known risk factors of QoL, we found a prominent tradeoff between following a hypertension diet as advocated by medical authorities and one's QoL. This tradeoff may explain the difficulties some patients may have in adhering to a strict diet. Physicians need to be aware of this tradeoff and

Table 5. Multivariate Analysis of Predictors of QoL in the Absence of Hypertension

Predictors of QoL in the hypothetical absence of HTN	OR	95% CI	<i>p</i>
<i>Demographics</i>			
Education	1.52	1.043-2.23	.029
Meeting basic needs			
Somewhat difficult	.39	.207-.73	.004
No difficulty	.17	.098-.32	<.0001
<i>Health Status</i>			
HTN related complications	1.79	.91-3.52	.09
Balanced blood pressure			
Occasionally	1.41	.93-2.16	.105
No	2.43	1.37-4.31	.002
BMI	1.055	1.027-1.083	<.0001
<i>Subjective Health Status</i>			
Subjective health status	.97	.65-1.46	.91
Mental distress	2.905	1.85-4.54	<.0001
<i>Health Behaviors</i>			
Physically active	1.11	.77-1.603	.54
HTN diet			
Occasionally	2.27	1.37-3.78	.001
Yes	2.61	1.71-3.99	<.0001
Pharmaceutical treatment	1.12	.54-2.32	.75
<i>Knowledge and Beliefs</i>			
HTN knowledge	1.48	.59-3.69	.39
Responsibility for HTN care	.58	.37-.89	.015
<i>Satisfaction and Perceived Quality of Medical Care</i>			
Level of explanation from medical team	.95	.87-1.041	.305

Logistic regression was conducted to evaluate predictors of QoL in the absence of hypertension ($\chi^2(16) = 145.32, p < .0001$).

specifically address it when counseling patients with hypertension. Physicians also need to be aware of the impact that information about imbalanced blood pressure has upon the QoL of their patients, inquire about their concerns, and provide more information and support in order to alleviate these concerns. Last, physicians may wish to use the QoL questions used in the present study for screening purposes as part of a more comprehensive approach to patient care. This may help identifying patients who may need professional counseling regarding the potential benefits associated with following a healthy life style.

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REFERENCES

1. Westin L, Nilstun T, Carlsson R, Erhardt L. Patients with ischemic heart disease: Quality of life predicts long-term mortality. *Scandinavian Cardiovascular Journal* 2005;39(1-2):50-54.
2. Jacobson DL, Wu AW, Feinberg J. Outcomes Committee of the Adult AIDS Clinical Trials Group: Health-related quality of life predicts survival, cytomegalovirus disease, and study retention in clinical trial participants with advanced HIV disease. *Journal of Clinical Epidemiology* 2003;56(9):874-879.
3. Fan VS, Curtis JR, Tu S-P, McDonell MB, Fihn SD, for the Ambulatory Care Quality Improvement Project Investigators. Using quality of life to predict hospitalization and mortality in patients with obstructive lung diseases. *Chest* 2002;122(2):429-436.
4. Rumsfeld JS, MaWhinney S, McCarthy M Jr, Shroyer ALW, VillaNueva CB, O'Brien M, Moritz TE, Henderson WG, Grover FL, Sethi GK, Hammermeister KE, for the Participants of the Department of Veterans Affairs Cooperative Study Group on Processes, Structures, and outcomes of care in cardiac surgery: Health-related quality of life as a predictor of mortality following coronary artery bypass graft surgery. *Journal of the American Medical Association* 1999;281:1298-1303.
5. Rubin RR, Peyrot M. Quality of life and diabetes. *Diabetes/Metabolism Research and Reviews* 1999;15:205-218.
6. Stein JD, Brown GC, Brown MM, Sharma S, Hollands H, Stein HD. The quality of life of patients with hypertension. *Journal of Clinical Hypertension (Greenwich)* 2002;4(3):181-188.
7. Battersby C, Hartley K, Fletcher AF, Markowe HJ, Styhles W, Sapper H, Bulpitt CJ. Quality of life in treated hypertension: A case-control community based study. *Journal of Human Hypertension* 1995;9(12):981-986.
8. Bardage C, Isacson DF. Hypertension and health-related quality of life. an epidemiological study in Sweden. *Journal of Clinical Epidemiology* 2001;54(2):172-181.
9. Li W, Liu L, Puente JG, Li Y, Jiang X, Jin S, Ma H, Kong L, Ma L, He X, Ma S, Chen C. Hypertension and health-related quality of life: an epidemiological study in patients attending hospital clinics in China. *Journal of Hypertension* 2005;23(9):1667-1676.

10. Anderson RT, Hogan P, Appel L, Rosen R, Shumaker SA. Baseline correlates with quality of life among men and women with medication-controlled hypertension. The trial of nonpharmacologic interventions in the elderly (TONE). *Journal of the American Geriatric Society* 1997;45(9):1080-1085.
11. Erickson SR, Williams BC, Gruppen LD. Perceived symptoms and health-related quality of life reported by uncomplicated hypertensive patients compared to normal controls. *Journal of Human Hypertension* 2001;15(8):539-548.
13. Barger SD, Muldoon MF. Hypertension labeling was associated with poorer self-rated health in the Third US National Health and Nutrition Examination Survey. *Journal of Human Hypertension* 2006;20(2):117-123.
14. Mena-Martin FJ, Martin-Escudero JC, Simal-Blanco F, Carretero-Ares JL, Arzueta-Mouronte D, Herreros-Fernandez V. Health-related quality of life of subjects with known and unknown hypertension: Results from the population-based Hortega study. *Journal of Hypertension* 2003;21(7):1283-1289.
15. Ayalon L, Gross R, Tabenkin H, Porath A, Heymann A, Porter B. *Determinants of quality of life in diabetic primary care patients*. Under review.
16. Yan LL, Daviglus ML, Liu K, Pirzada A, Garside DB, Schiffer L, Dyer AR, Greenland P. BMI and health-related quality of life in adults 65 years and older. *Obesity Research* 2004;12(1):69-76.
17. Swallen KC, Reither EN, Haas SA, Meier AM. Overweight, obesity, and health-related quality of life among adolescents: The National Longitudinal Study of Adolescent Health. *Pediatrics* 2005;115(2):340-347.
18. Thommasen HV, Self B, Grigg A, Zhang W, Birmingham CL. The relationship between self-rated health, stress, health care, overall quality of life and weight in a rural population. *Eating and Weight Disorders* 2005;10(3):66-69.
19. Movsas DB, Scott DC, Watkins-Bruner DD. Pretreatment factors significantly influence quality of life in cancer patients: A radiation therapy oncology group (RTOG) analysis. *International Journal of Radiation, Oncology and Biology Physicians* 2006;24: [Epub ahead of print].
20. Luttik ML, Jaarsma T, Veeger N, van Veldhuisen DJ. Marital status, quality of life, and clinical outcome in patients with heart failure. *Heart and Lung* 2006;35(1):3-8.
21. Bernhard J, Sullivan M, Hurny C, Coates AS, Rudenstam CM. Clinical relevance of single item quality of life indicators in cancer clinical trials. *British Journal of Cancer* 2001;84(9):1156-1165.
22. deBoer AG, van Lanschott JJ, Stalmeier PF, van Sandick JW, Hulscher JB, de Haes JC, Sprangers MA. Is a single-item visual analogue scale as valid, reliable and responsive as multi-item scales in measuring quality of life? *Quality of Life Research* 2004;13(2):311-320.

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