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Health-related Quality of Life among Hypertensive Patients Compared with General Population Norms

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The 36-item short form (SF-36) health survey is the most popular generic HRQOL instrument that has been widely used to measure several population studies and variety of health conditions, including hypertension. The objectives of this study were to compare the HRQOL of hypertensive patients with that of a general population norm and analyze differences according to the presence of comorbid conditions such as diabetes mellitus and cardiovascular comorbidities. A total of 388 hypertensive patients was included in this cross-sectional study. Socio-demographic information and the presence of diabetes mellitus and cardiovascular comorbidities were recorded. HRQOL was assessed by using SF-36 instrument. General linear models were used to identify statistically significant differences in scale scores. Hypertensive patients reported lower scores in six SF-36 dimensions except bodily pain and role emotional dimension when compared with Malaysian norms. After adjusting for socio-demographic variables (age, gender, education and employment), SF-36 scores in the presence of diabetes mellitus and cardiovascular comorbidities were comparably limited and both had statistically significantly lower scores than hypertensive patients without comorbidities. Hypertension reduced HRQOL and cardiovascular comorbidities exacerbate reductions. Hence, future research of effective interventions should include ensuring desirable HRQOL as well as controlling blood pressure to prevent or reduce comorbidities of hypertension.

Key words: Health-related quality of life, hypertension, comorbidity, health status, SF-36

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INTRODUCTION

Health-related Quality of Life (HRQOL) is emerging as an important outcome in hypertension studies. HRQOL of people with hypertension can be adversely affected by hypertension itself and side-effect of treatments. Anxiety and depression have been reported among hypertensive patients (Erickson *et al*., 2004; Kiran *et al*., 2010; Saboya *et al*., 2010). Labeling effects, beliefs and attitudes about illness affect HRQOL of hypertensive (Mena-Martin *et al*., 2003; Li *et al*., 2005). Thus, hypertension may have an impact on patients' physical, psychological and social functioning, that altered their HRQOL. Many instruments have been developed for quality of life assessments and generic HRQOL measures allow comparisons across different populations. The 36-item short form (SF-36) health survey (Ware and Sherbourne, 1992) is one of the most popular generic HRQOL instruments. It has been administered to several population studies (Azman *et al*., 2003) and variety of health conditions (Johnson, 2006; Shafipour *et al*., 2010; Douki *et al*., 2010; Hosseini and Yousefi, 2009; Taragh and Ilali, 2010), including hypertension (Bardage and Isacson, 2001; Erickson *et al*., 2004; Aydemir *et al*., 2005; Ogunlana *et al*., 2009; Wang *et al*., 2009; Poljicanin *et al*., 2010; Wan-Fei *et al*., 2011).

Epidemiological (Bardage and Isacson, 2001; Wang *et al*., 2009; Poljicanin *et al*., 2010) and clinical studies (Erickson *et al*., 2004; Aydemir *et al*., 2005; Ogunlana *et al*., 2009; Saboya *et al*., 2010; Wan-Fei *et al*., 2011) assess the effect of hypertension on HRQOL had been carried out in various countries; quality of life was shown to decrease among hypertensive patients in the SF-36 scale scores. Erickson *et al*. (2004) found that hypertensive patients scores lower (i.e., poor HRQOL) on all SF-36 scales when compared to normal control. Poljicanin *et al*. (2010) compared SF-36 scores of hypertensive patients to those of patients with diabetes mellitus or other cardiovascular comorbidities. Patients with hypertension had comparable HRQOL to patients with diabetes mellitus and both samples had scored significantly higher than those with cardiovascular comorbidities on all SF-36 scales. Bardage and Isacson (Bardage and Isacson, 2001) found that HRQOL in SF-36 scores were poorer in hypertensive patients than in general population, especially in the physical domains while less pronounced in mental domains. Complications in hypertension further deteriorate patient's quality of life.

It would be interesting to assess which reductions in HRQOL that are unique to patients with hypertension, when compared with patients with other complications. The HRQOL of hypertension has been compared with hypertensive patients with complications such as diabetes mellitus, cardiovascular diseases, nephropathy, retinopathy and other comorbidities (Bardage and Isacson, 2001; Aydemir *et al*., 2005; Ogunlana, *et al*., 2009; Wang *et al*., 2009; Poljicanin *et al*., 2010; Wan-Fei *et al*., 2011). Epidemiological research of HRQOL in Malaysia has been conducted for general population (Azman *et al*., 2003) while research of HRQOL in Malaysia participants with chronic conditions is still lacking. Hypertension is the major chronic disease that affects the largest number of individuals and lead to severe complications (Damorou *et al*., 2009). Thus, the present study aimed to compare the HRQOL of hypertensive patients with that of a general population. The HRQOL differences according to presence of comorbid conditions such as diabetes mellitus and cardiovascular comorbidities were analyzed.

MATERIALS AND METHODS

Participants: A cross-sectional study was carried out in Serdang Hospital, Selangor, Malaysia from November 2008 to April 2009. A total of 388 respondents who had been confirmed diagnosed of hypertension and taking antihypertensive medication at least 6 months, aged 21 to 80 years old and able to read or understand in Malay language were recruited into this study. This study was approved by the Ethical Committees of Ministry of Health, Malaysia and the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

Instruments: All participants were interviewed personally by the first author using a structured pre-tested questionnaire. The questionnaire was designed to collect socio-demographic information such as age, gender, educational status and employment status. Participants were asked about the presence or absence of comorbid conditions including diabetes, heart disease and stroke. These information were later validated with their medical records. Respondents were divided into 3 groups: participants with hypertension, participants with hypertension and cardiovascular co-morbidities, participants with both hypertension and diabetes mellitus. Cardiovascular comorbidities were defined as self-reported history of angina, myocardial infarction, heart insufficiency or stroke.

HRQOL was assessed by SF-36, the medical outcome study short-form health survey (Ware and Sherbourne, 1992). The Malay version of the SF-36 was translated, validated and established norms of the SF-36 in Malaysia (Azman *et al*., 2003). Psychometric testing of the SF-36 shown that it demonstrated adequate reliability

and validity (Sararaks *et al.*, 2005). The instrument consists of 36 items that are scored to measure eight domains of health Physical Functioning (PF), role limitations due to physical health problems (RP), Bodily Pains (BP), General Health (GH), Vitality (VT), Social Functioning (SF), role limitations due to emotional health (RE) and Mental Health (MH). Scores range from 0 (poorest health) to 100 (optimal health).

Reference population: The reference group consists of a random sample (n = 3072), aged 18 to 87 years which was representative of the general Malaysian population (Azman *et al.*, 2003).

Statistical analysis: All statistical analyses were performed using SPSS. Descriptive analysis included calculations of means, standard deviations and frequencies of categorical variables. To estimate the HRQOL of hypertension, we computed the mean of SF-36 scale scores for the 388 hypertensive patients of this study. We compared the mean scores reported by the study patients to general population scores by using t-test. Separate ANCOVAs were used to estimate the individual scales on which the group differed significantly, when socio-demographic variables such as age, gender, educational level and employment status were controlled. Post hoc analyses were performed to determine which groups contribute to the significant differences ($p<0.05$).

RESULTS

Table 1 shows the characteristics of respondents. A total of 388 patients was included in this study. Their average age was 60 years. Of the sampled patients, 61.8% were Malay, 25.8% were Chinese and 12.4% were Indian. A majority of the respondents were married (74.5%) and unemployed (72.7%). Almost half of respondents had graduated from secondary school. There were 138 participants with hypertension, 154 participants with hypertension and diabetes mellitus and 96 participants with hypertension and cardiovascular comorbidities (Table 1).

The mean SF-36 scale scores for the 388 adults with hypertension were significantly lower than the Malaysian norms for physical functioning, role limitations due to physical problems, vitality, mental health, social functioning and general health (Table 2). However, the scores for role limitations due to emotional problems and bodily pain were consistent with general population norms.

Adjusted mean differences for the eight-domain scales are presented in Table 3. After adjusting for socio-demographic variables (age, gender, education and employment), patients with cardiovascular comorbidities had lower scores than hypertensive patients on all scales except mental health and bodily pain. Patients with hypertension and diabetes mellitus had lower health-related quality of life (HRQOL) scores than patients with hypertension on the physical function scale. There were no significant differences between hypertensive patients with diabetes mellitus and cardiovascular comorbidities in all SF-36 scales except for the role-emotional domain.

Table 1: Characteristics of respondents (N = 388)

Characteristics	N	%
Gender		
Male	181	46.6
Female	207	53.4
Age		
Mean±SD	59.72±12.46	
Ethnicity		
Malay	240	61.8
Chinese	100	25.8
Indian	48	12.4
Marital status		
Single	24	6.2
Married	289	74.5
Divorced/widowed	75	19.3
Working status		
Employed	106	27.3
Unemployed	282	72.7
Educational level		
No formal education	62	16.0
Primary school	150	38.7
Secondary school	130	33.5
University or higher	46	11.8
Comorbidities		
Hypertension only	138	35.6
Hypertension and Diabetes Mellitus	154	39.7
Hypertension and cardiovascular comorbidities	96	24.7

Table 2: Comparison of SF-36 scores of adults with hypertension and the general population scores

SF-36 domains	Hypertension (N = 388) (Mean±SD)	Normal population (N = 3072) (Mean±SD)	Mean difference	p-value
Physical functioning	73.15±27.68	85.98±17.91	-12.83	<0.001
Role physical	62.60±39.24	82.03±32.12	-19.43	<0.001
Role emotional	76.92±34.35	79.23±35.92	-2.31	0.186
Vitality	58.39±19.45	66.79±17.68	-8.40	<0.001
Mental health	70.53±19.46	74.66±17.19	-4.13	<0.001
Social functioning	78.34±25.14	83.73±19.28	-5.39	<0.001
Bodily pain	72.05±26.50	69.96±17.59	2.09	0.121
General health	56.86±21.42	66.74±19.99	-9.88	<0.001

Table 3: Adjusted mean* SF-36 scale scores by comorbidities for adults with hypertension, hypertension with diabetes mellitus and hypertension with CVD comorbidities

SF-36 scale scores	Hypertension	Hypertension with diabetes mellitus	Hypertension with CVD comorbidities	p-value
Physical functioning	80.36	71.34[a]	65.52[a]	<0.001
Role physical	69.88	59.99[a]	58.72[a]	0.044
Role emotional	79.59[a]	79.85[a]	69.64	0.046
Vitality	62.03	57.03[a]	56.53[a]	0.046
Mental health	71.56	70.24	68.88	0.590
Social functioning	81.44[a]	78.75[ab]	72.12[b]	0.025
Bodily pain	75.82	70.48	70.90	0.154
General health	60.98	55.53[a]	54.06[a]	0.031

*Adjusted for age, gender, educational level and employment status. Means in a row with the same letter do not differ significantly, p<0.05 according to post hoc test

DISCUSSION

Hypertensive patients had lower scores on all domains in the SF-36 instrument-scale than the Malaysian norms except for bodily pain and role emotional. These results suggest that the burden of disease, as indicated by HRQOL (Ware and Sherbourne, 1992), is primarily in the physical dimensions of health. Although this finding contrasts with the traditional idea that hypertension is an asymptomatic condition, this is consistent with other HRQOL studies (Bardage and Isacson, 2001; Erickson *et al*., 2004; Wang *et al*., 2009; Poljicanin *et al*., 2010) which showed that hypertension was associated with alterations in HRQOL. This might suggest that hypertension causes some changes in patient's life, such as those related to behavioral and psychological characteristics.

Hypertension was related to significantly lower physical scales, including physical functioning, role physical and general health scales, when compared to comparable measures in the Malaysian normal population (the norm). The differences in scores in domains related to mental health were smaller than those in domains related to physical function. These smaller reductions in mental health domains concur with previous reports (Aydemir *et al*., 2005) and support the suggestion that people with hypertension tend to have a better coping mechanism and adaptation to this disease, especially the elderly. It is possible that the hypertension condition has developed for many years in most respondents; hence psychological adaptation may lead to least decline in subjective well-being in hypertensive patients (Kempen *et al*., 1997). In contrast, the results of our study are not consistent with the outcomes previously reported by Bardage and Isacson (2001) and other previous studies (Battersby *et al*., 1995; Li *et al*., 2005). They found significant negative effects of hypertension on mental, social and psychological well-being. However, the two study samples use different study populations. The present study used a clinical-based older sample (mean age = 60 years), whereas Bardage and Isacson used a community-based sample (mean age = 46 years). Besides, anxiety and depression maybe the possible reason of the relationship between HRQOL and hypertension which could not be assessed in this study (Saboya *et al*., 2010).

Cardiovascular comorbidities affected most of the domains in HRQOL negatively (Lalonde *et al*., 2004; Baune and Aljeesh, 2006; De Gusmao *et al*., 2009). It has an impact on both physical and mental domains. Results of this study are consistent with the findings of studies on hypertensive patients with angina, myocardial infarction and stroke which reported lower physical and psychological well-being (Lalonde *et al*., 2004; Poljicanin *et al*., 2010). These findings agree with another study which showed that cardiovascular diseases can cause physical disability and psychological stress, thus, affect the HRQOL assessment (Baune and Aljeesh, 2006).

In the present study, about half of hypertensive patients did have diabetes mellitus. They reported more impairment in physical domains than mental domains, in agreement with previous studies (Saito *et al*., 2006). Hypertension with diabetes mellitus resulted in lower HRQOL than those with hypertension per se, in physical functioning, role-physical, vitality and general health. Wee *et al*. (2005) identified diabetes mellitus and hypertension as having an additive effective which is probably due to an interaction, in producing lower HRQOL. Subjects with diabetes mellitus and hypertension experienced further lowering of physical functioning scores by 2.3 points. In contrast to these findings it has also been reported that there is no further impact on quality of life due to hypertension and diabetes mellitus (Aydemir *et al*., 2005).

We found no statistically significant differences between hypertensive patients with cardiovascular comorbidities and those with diabetes mellitus. There are probably at least two reasons for these findings. First, we did not assess the biomedical severity of the chronic conditions. Second, in this study patients were recruited from hospital-based and therefore tend to have more severe illness than subjects from the general population. It is not known whether cardiovascular comorbidities and diabetes mellitus impact similarly on quality of life of hypertensive patients.

The SF-36 scale is a generic instrument, is available in many languages and had been used to assess quality of life in many chronic conditions (Sprangers *et al*., 2000; Alonso *et al*., 2004; Assal *et al*., 2006; Shafipour *et al*., 2010; Yazdi *et al*., 2008; Douki *et al*., 2010; Taspinar *et al*., 2010). The smaller reductions in many dimensions of HRQOL in hypertension than in several other chronic diseases might indicate lesser sensitivity of the SF-36 questionnaire to capture and measure attributes of health more specific for hypertension. These attributes may include symptoms such as headache, dizziness, irritability, memory impairment, blurred vision, sexual dysfunction, sleep disorder and emotional problems such as anxiety and depression (Bulpitt *et al*., 1976). These symptoms of hypertension and medications' side effects might be crucial for HRQOL among hypertensive patients. As SF-36 instrument does not have items on specific symptoms and side effects of medications, it could not capture such reductions in those aspects. Therefore, it is useful to supplement SF-36 assessment with hypertension specific HRQOL measures such as Bulpitt's Hypertension Questionnaire and Batteries (Bulpitt and Fletcher, 1994).

The findings should also be interpreted in the perspectives of convenience sampling and reliance on patient recall especially for comorbidities. Subjects were recruited from one hospital, hence this disproportionate representation limits the generalizability and interpretation of findings to other groups such as those of other racial origin, cultural backgrounds or younger patients. Moreover, we cannot definitively exclude that the possible arthritis and/or obstructive lung conditions were more severe and acted as cofounders. These probably lead to an overestimation of the reduction in HRQOL in our measurement.

CONCLUSION

Hypertensive patients presented a lower HRQOL scores in SF-36 than the general population. These measured deteriorations of the physical health domains were most apparent when compared with Malaysian norm. A similar finding concerns the HRQOL of hypertensive patients with cardiovascular comorbidities and diabetes mellitus. Moreover, these two groups had poorer HRQOL when compared with patients with hypertension. This study provides an insight on HRQOL in hypertensive patients with and without the presence of comorbidities. Hence, effective health interventions should ensure maintenance of desirable HRQOL as well as controlling of blood pressure, in order to prevent or reduce comorbidities of hypertension.

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