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QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG HYPERTENSIVE PATIENTS IN A TERTIARY CARE HOSPITAL IN RIYADH, SAUDI ARABIA

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Abstract:

Background: *Prevalence of hypertension is increasing every year in Saudi Arabia, where it is one of the major risk factors for cardiovascular mortality. Chronic diseases like hypertension can severely affect the quality of life of patients, an important measure of well-being. This study aimed to assess the health-related quality of life and its associated factors among adult hypertensive patients in a tertiary care hospital.*

Methods: *A comparative cross-sectional study was carried in the outpatient clinics of King Khalid University Hospital. It included patients of either sex, aged >=18 years and diagnosed with hypertension for the first group and without hypertension for the comparison group. Data was collected from the patients gave consent, using the WHO Quality of Life-BREF (WHOQOL-BREF) tool. Bivariate and multivariable analyses were carried out using SPSS.*

Results: *A total of 236 hypertensive and 254 non-hypertensive patients were included. Mean quality of life scores were 70.8 (physical), 72.9 (psychological), 76.7 (social) and 67.9 (environmental). The WHOQOL-BREF tool demonstrated high reliability (Chronbach's alpha 0.91). Adjusted analysis showed that the hypertensive patients had a significantly higher score in the physical health, psychological health and social relationships domains as compared to non-hypertensives, after adjusting for age, gender and other demographic variables.*

Conclusion: *Hypertensive patients scored higher than the non-hypertensive patients, especially in the physical health, psychological health and social relationship domains of QOL. A comprehensive and holistic plan, targeting the various dimensions of health is necessary for improving the quality of life of hypertensive patients.*

Keywords: *Cross-sectional, hypertension, quality of life, WHOQOL-BREF, Saudi Arabia*

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INTRODUCTION:

The prevalence of non-communicable diseases (NCDs), including hypertension is increasing throughout the world. According to the World Health Organization (WHO), 43% of the morbidity and 70% of deaths worldwide was due to NCDs in 2015. This burden was projected to increase to increase to 60% & 75%, respectively by 2020.(1) In the Eastern Mediterranean Region, more than 600 deaths per 100,000 population occur every year due to NCDs, which is higher than the global death rate due to NCDs.(2)

Of the NCD related deaths, more than 40% of the deaths are due to cardiovascular diseases, such as ischemic heart disease and stroke.(2) Hypertension is the most important risk factor for ischemic heart disease and stroke, the most common causes of death, worldwide, for the past several decades.(3) Hypertension attributable risk fraction for both of the above causes is about 55%, signifying the importance of hypertension control for improving a vast majority of the population health.(3)

The worldwide prevalence of high blood pressure in 2014 was about 22% among adults aged >18 years.(2) According to the WHO, in 2010, complications of hypertension accounted for 9.4 million deaths worldwide.(4) In the Eastern Mediterranean Region, prevalence of hypertension among persons aged 25 years or more was about 40% in 2008.(5) In Saudi Arabia, in 2013, about 15% of the adults aged more than 15 years were hypertensive and nearly 40% were pre-hypertensives.(6) In 2016, high systolic blood pressure was the third leading risk factor contributing to death and disability in Saudi Arabia (7) and it contributed to 479,759 DALYs, which was about 8% of the total DALYs.(3) It is clear from the foregoing that hypertension is a major modifiable risk factor, which if controlled adequately can dramatically improve the life expectancy as well as quality of life in Saudi Arabia.

The WHO defines Quality of Life (QOL) as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”.(8) Health is an important predictor of QOL, especially in older individuals, but there are many more predictors of QOL. Health- related quality of life (HRQOL) is defined as “optimum levels of mental, physical, role (e.g. work, parent, career, etc.) and social functioning, including relationships, and perceptions of health, fitness, life satisfaction and well-being”.(9) HRQOL among patients is increasingly used as a measure for allocating and choosing interventions for a disease throughout the world.

Chronic diseases like hypertension due their duration of treatment and associated complications affect the quality of life of patients in a major way.(10) Such chronic disease may affect QOL in more than one dimension. Many studies conducted throughout the world suggest that quality of life is poorer among patients with chronic disease than the normal individuals.(11–16) But there are only a handful of studies from Eastern Mediterranean region that explore the HRQOL among hypertensive patients.(17) Therefore, this study aimed to assess the health-related Quality of Life and its associated factors among hypertensive patients attending outpatient clinics at a tertiary care hospital, Riyadh, Saudi Arabia.

MATERIALS AND METHODS:

This comparative cross-sectional study was designed and carried out in the outpatient clinics of King Khalid University Hospital in Riyadh, Saudi Arabia during 2017-18. A sample of hypertensive patients and non-hypertensive patients were recruited from the family medicine clinics for this study. The selection criteria included patients of either sex, aged 18 or more years and diagnosed with hypertension for the first group and without hypertension for the comparison group. Pregnant women and severely ill patients were excluded from the study. The sample size was calculated on the basis of estimating the difference between two independent means of the quality of life scores as per the WHOQOL-BREF scale from a previous study.(18) For a mean difference in score of 0.25, an alpha error of 5% and a power of 80% and a non-response rate of 20%, the final minimum sample size was calculated as 230 in each group. The sampling of participants was conducted in a consecutive manner in the study clinics till the required sample size was achieved. Data was collected from the patients who satisfied the selection criteria and gave consent, using an interview schedule. The questionnaire contained questions on socio-demographic data, smoking status and clinical features such as duration of illness, number of antihypertensive drugs, number of daily doses and compliance, symptoms and comorbidities such as diabetes mellitus, renal disease, cardiac disease, stroke, osteoarthritis and others. To measure the quality of life, the WHO Quality of Life-BREF (WHOQOL-BREF) questionnaire was used.(19) This tool has been validated widely and was considered appropriate for use in the current context.(19) This scale consists of two general items, one each on overall QOL and general health and 24 items of satisfaction divided into four domains - physical health with 7 items, psychological health with 6 items, social relationships with 3 items and

environmental health with 8 items. Each item is rated on a 5-point Likert scale. Each item of the WHOQOL-BREF is scored from 1 to 5 on a response scale. Domain scores are scaled in a positive direction (i.e., higher scores denote higher quality of life). The mean score of items within each domain was used to calculate the domain score.(20) Blood pressure was measured in the right arm, using mercury sphygmomanometer following standard precautions of blood pressure measurement. Similarly, height and weight were measured using standard procedures and BMI was derived from these two measurements to quantify the degree of obesity.

Descriptive analyses were done to present categorical variables as frequencies and percentages and continuous variables as means, and standard deviations (SD). The domain scores of the WHOQOL-BREF tool were calculated by adding up the individual items after reverse coding the items framed in the negative direction. These domain scores were then transformed to a '0 to 100' scale to be able to compare results with the original tool. Bivariate associations between the participants' characteristics and the WHOQOL-BREF domain scores were tested using one-way Analysis of Variance test. Multiple linear regression technique was used to calculate adjusted coefficients of association between the various factors and WHOQOL-BREF domain scores. The dependent variables for this study were the domains scores of the WHOQOL-BREF scale, which were in the continuous scale. The independent variables were hypertension status (hypertensive, non-hypertensive), age (<=45, 46-55, 56-65, >=66 years), gender (male, female), marital status (single, married, widowed/divorced), education (illiterate/read and write only, any school education, higher education), employment (employed, unemployed), smoking status (never smoker, current smoker, ex-smoker), BMI categories (underweight, normal, overweight, obese) and presence of any chronic disease (no, yes). These variables were in the nominal scale. The model performance was evaluated using R square and model significance in the ANOVA test. All analyses were carried out in SPSS version 21. A p value of less than 0.05 was considered to be statistically significant.

Written informed consent was obtained from all participants before participating in the study. Ethical approval was obtained from the clinical research ethics committee of the faculty of medicine, King Saud University, Riyadh, Saudi Arabia.

RESULTS:

Socio-demographic and clinical characteristics

A total of 236 hypertensive and 254 non-hypertensive patients were finally recruited in this study. A majority of the patients were men (hypertensive group 71.6% and non-hypertensive group 63.8%). While most of the patients in the hypertensive group were aged 46 or more, those in the non-hypertensive group were younger. In the hypertensive group, 94.7% were married compared to 60.7% in the non-hypertensive group. About half (50.8%) of the hypertensive patients received any school education but 81.5% of the non-hypertensive patients had higher education degree. A higher percent of non-hypertensive patients (71.3%) were employed as compared to hypertensive patients (55.5%). With respect to the clinical features, nearly one-fifth of the patients in both the groups were (19.5% and 18.5%) current smokers, and a vast majority were overweight or obese (78.4% in the hypertensive group and 68.8% in the non-hypertensive group). The mean (SD) height (cm) and weight (Kg) in the two groups were 168 (9) and 165 (12), and 79 (16) and 76 (20), respectively. The mean (SD) BMI was similar in both the groups- 28.3 (5.1) and 27.2 (5.9). A vast majority (88.6%) of hypertensive patients reported suffering from another chronic disease such as diabetes, foot issues or cardiac diseases whereas only 20.5% in the other group reported so.(Table 1)

Table 1. Socio-demographic and clinical characteristics of the study participants (n=490)

	Hypertensive group		Non-hypertensive group	
	No.	**%**	**No.**	**%**
Age				
<=45	22	9.3	204	80.3
46-55	62	26.3	38	15.0
56-65	109	46.2	10	3.9
>=66	43	18.2	2	0.8
Gender				
Male	169	71.6	162	63.8
Female	67	28.4	92	36.2
Marital status				
Single	5	2.2	95	37.7
Married	213	94.7	153	60.7
WidowedDivorced /	7	3.1	4	1.6
Education				
IlliterateRead and write only /	48	20.3	6	2.4
Any school education	120	50.8	41	16.1
Higher education	68	28.8	207	81.5
Employment status				
Employed	131	55.5	181	71.3
Unemployed	105	44.5	73	28.7
Smoking status				
Never smoker	124	52.5	195	76.8
Current smoker	46	19.5	47	18.5
Ex-smoker	66	28.0	12	4.7
BMI category				
Underweight	4	1.7	9	3.6
Normal	47	19.9	94	37.6
Overweight	116	49.2	77	30.8
Obese	69	29.2	70	28.0
Presence of any chronic disease				
No	27	11.4	202	79.5
Yes	209	88.6	52	20.5
Total	**236**	**100.0**	**254**	**100.0**

In the hypertension group, about one-third (35.6%) of the patients had elevated blood pressure for one to four years and a similar proportion (34.3%) had it for 10 or more years. Nearly all the patients (98.3%) were on antihypertensive drugs and among them three-quarters took just one drug and about 90% took it regularly and the most common reason given for irregular intake of drugs was forgetfulness. More than half of the patients (56.8%) reported currently experiencing some symptom such as headache, fatigue, insomnia, dizziness, palpitation and others.

Quality of life

The mean (SD) score for overall quality of life and satisfaction with general health was 4.2 (0.9) for the hypertensive group, and for the non-hypertensive group the scores were 4.0 (0.8) and 3.8 (1.0), respectively. The distribution of quality of life scores were on the higher side of the scale for a majority of the hypertensive patients as compared to the non-hypertensive group.(Figure 1) Among the four domains of the WHOQOL-BREF tool, the highest mean (SD) score was in the social relationship domain 76.7 (14.5), followed on by the psychological domain 72.9 (14.9), the physical domain 70.8 (17.4) and the lowest score was in the environmental domain 67.9 (15.7), for the hypertensive group. For the non-hypertensive group, the highest score was in the physical domain 69.5 (14.9), followed by the psychological 64.4 (15.8), the social relations 62.2 (20.5) and the environmental domains 59.9 (16.1).(Figure 2)

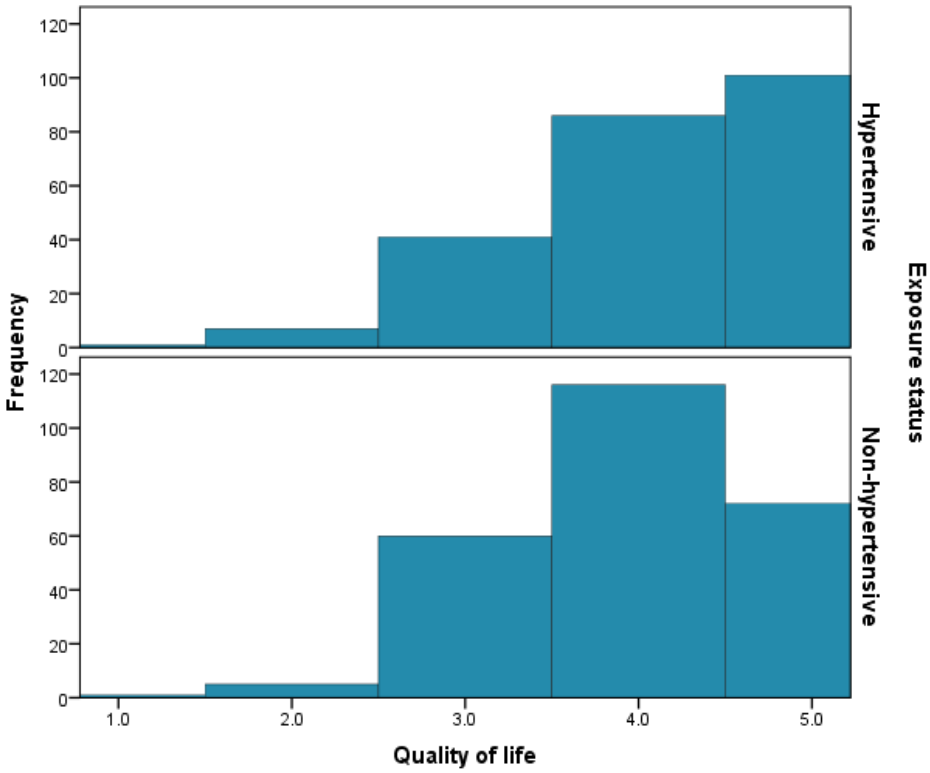

Figure 1. Distribution of overall quality of life scores by hypertension status

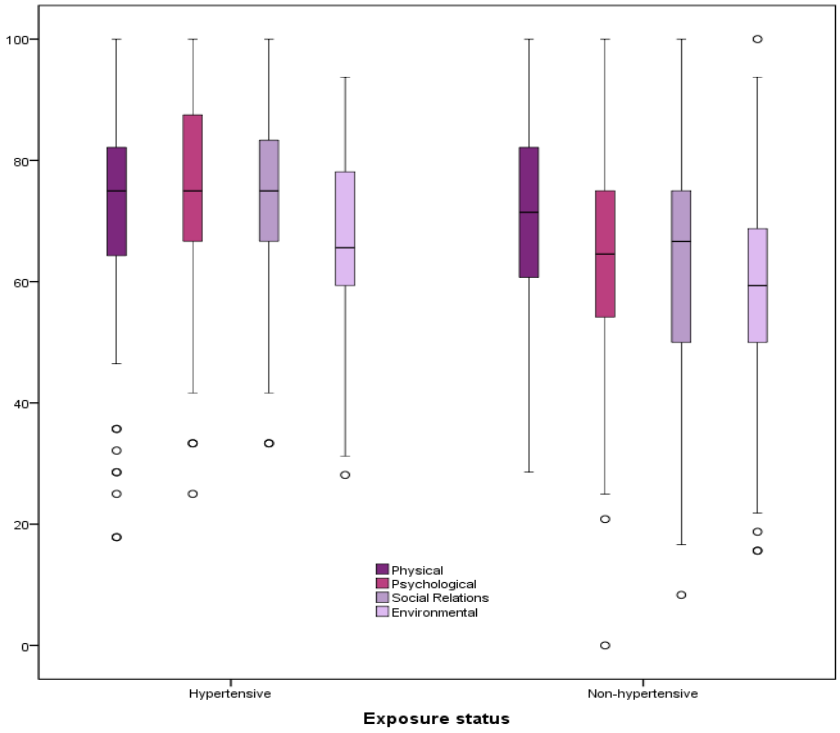

Figure 2. Distribution of the four WHOQOL-BREF domain scores by hypertension status

Reliability measures

The Chronbach's alpha calculated for the 26-item scale was 0.91 indicating a high reliability with an intraclass correlation coefficient of 0.28 (95% CI 0.24 to 0.31). Similarly, the Chronbach's alpha for the four domains of the scale also indicated high reliability (physical health 0.78, psychological health 0.78, social relationships 0.63, and environmental domain 0.79). Between domain correlation indicated that the highest correlation was between the psychological health and environment domains (r=0.64) and the weakest correlation was between the physical health and social relationships domains (r=0.53).(data not

shown)

Factors affecting quality of life

In the bivariate analysis, each factor was tested for association with the six domains of the WHOQOL-BREF tool. Hypertension status was significantly associated with all the domains except physical domain. Age was found to be significantly associated with all the domains whereas gender was not associated with any of them. Marital and smoking statuses were found to be significantly associated with all domains except the physical domain whereas education was associated with all except the environmental domain and employment status was associated with physical domain only. BMI was not associated with any domain but the presence of a chronic disease was associated with psychological, social relations and environmental domains.(Table 2)

Table 2. Mean (SD) scores of WHOQOL-BREF domains by socio-demographic and clinical characteristics of the study participants (n=490).

	Quality of life	Satisfaction with health	Physical	Psychological	Social relations	Environmental
Hypertension status						
Hypertensive	4.2 (0.9)*	4.2 (0.9)***	70.8 (17.4)	72.9 (15)***	76.7 (14.5)***	67.9 (15.7)***
Non-hypertensive	4.0 (0.8)	3.8 (1.0)	69.5 (14.9)	64.4 (15.8)	62.2 (20.5)	59.9 (16.1)
Age						
<=45	3.9 (0.8)***	3.7 (1.1)***	68.6 (15.0)***	63.4 (16.2)***	61.2 (20.9)***	58.5 (16.6)***
46-55	4.4 (0.7)	4.2 (0.8)	74.6 (13.6)	73.3 (14.2)	73.8 (16.9)	67.8 (14.2)
56-65	4.2 (0.8)	4.4 (0.8)	74.0 (13.9)	73.7 (13.7)	75.5 (13.8)	69.5 (14.0)
>=66	4.0 (0.9)	4.1 (1.0)	58.0 (23.6)	69.8 (16.3)	77.4 (16.5)	65.8 (18.1)
Gender						
Male	4.1 (0.8)	4.0 (1.0)	69.9 (16.4)	68.6 (16.1)	68.2 (20.1)	63.3 (16.4)
Female	4.0 (0.8)	4.0 (1.0)	70.8 (15.7)	68.3 (15.7)	68.6 (18.1)	64.6 (16.2)
Marital status						
Single	3.7 (0.9)***	3.7 (1.2)**	68.5 (15.5)	60.5 (17.8)***	52.5 (20.1)***	58.4 (17.4)***
Married	4.2 (0.8)	4.1 (0.9)	71.1 (15.6)	70.8 (14.8)	71.6 (17.7)	65.1 (15.9)
Widowed/ Divorced	4.5 (0.8)	4.0 (1.2)	73.7 (15.8)	67.4 (15.2)	76.4 (9.7)	72.4 (14.2)
Education						
Illiterate/ Read and write only	3.8 (0.9)**	3.9 (1.0)**	56.9 (22.5)***	64.7 (18.1)**	72.0 (13.9)**	61.7 (19.0)
Any school education	4.2 (0.8)	4.2 (0.9)	72.1 (14.0)	71.4 (15.3)	72.5 (18.1)	65.7 (14.9)
Higher education	4.1 (0.8)	3.9 (1.0)	71.6 (14.6)	67.6 (15.7)	65.3 (20.5)	62.9 (16.6)
Employment status						
Employed	4.1 (0.8)	4.0 (1.0)	71.7 (14.2)**	68.9 (15.6)	68.6 (19.0)	62.8 (15.7)
Unemployed	4.0 (0.9)	4.0 (1.0)	67.5 (18.9)	67.8 (16.7)	67.5 (20.7)	65.4 (17.4)
Smoking status						
Never smoker	4.1 (0.8)***	4.0 (1.0)***	70.0 (16.2)	67.7 (15.6)**	66.3 (20.1)**	63.5 (16.1)*

Current smoker	3.8 (0.9)	3.8 (1.1)	70.0 (15.6)	66.2 (17.6)	68.8 (19.1)	60.8 (18.6)
Ex-smoker	4.3 (0.8)	4.3 (0.8)	71.1 (16.9)	74.6 (14.3)	75.3 (16.1)	67.8 (13.6)
BMI categories						
Underweight	3.5 (0.7)	3.7 (1.2)	70.3 (17.4)	63.1 (17.5)	58.3 (19.2)	62.5 (19.0)
Normal	4.1 (0.7)	4.0 (0.9)	69.9 (17.0)	68.3 (14.1)	65.0 (19.1)	63.7 (16.2)
Overweight	4.2 (0.9)	4.1 (1.0)	70.8 (16.2)	70.3 (16.2)	69.7 (18.6)	64.6 (16.0)
Obese	4.0 (0.8)	3.9 (1.0)	69.6 (15.3)	66.9 (17.3)	69.5 (21.0)	62.7 (17.1)
Presence of any chronic disease						
No	4.0 (0.8)	3.9 (1.0)	70.4 (14.2)	65.3 (16.2)***	63.4 (20.0)***	60.1 (16.2)***
Yes	4.2 (0.8)	4.0 (1.0)	69.9 (17.7)	71.3 (15.2)	73.5 (17.7)	66.9 (15.9)

Note: P value for One-way ANOVA test, ***<0.001, **<0.01, *<0.05.Table

In multiple linear regressions, each domain's score was regressed with a set of the socio-demographic and clinical factors keeping the hypertension status as the main exposure variable. Patients with hypertension reported significantly higher QOL score in the physical (b=-4.83, p=0.04), psychological (b=-5.46, p=0.02) and social relationship domains (b=-8.94, p=0.004) as compared to patients without hypertension, after adjusting for age, gender, marital status, education, employment status, smoking status, BMI and presence of chronic disease. However, hypertension status was not significantly associated with the overall quality of life, satisfaction with general health and the environmental domain, even after adjusting for the eight other independent variables. Among the six regression models, the highest R square was obtained for the social relationship domain with the strongest regression coefficient for the hypertension status.(Table 3).

Table 3. Multiple Linear Regression – socio-demographic and clinical factors associated with WHOQOL-BREF domain scores in the study participants. Note: *beta coefficient is for the non-hypertensive group

	Quality of life		**Satisfaction with health**		**Physical**		**Psychological**		**Social relations**		**Environmental**	
	Beta	**P value**	**Beta**	**P value**	**Beta**	**P value**	**Beta**	**P value**	**Beta**	**P value**	**Beta**	**P value**
Hypertension status*	0.02	0.89	-0.18	0.23	-4.83	**0.04**	-5.46	**0.02**	-8.94	**0.004**	-4.09	0.09
Age	0.13	**0.03**	0.32	**<0.001**	1.78	0.12	3.41	0.002	2.63	0.12	3.94	**0.001**
Gender	-0.02	0.78	0.13	0.18	1.04	0.49	1.06	0.48	2.87	0.18	1.83	0.24
Marital status	0.33	**<0.001**	0.13	0.25	1.77	0.34	4.90	**0.01**	11.69	**<0.001**	3.41	0.07
Education	0.16	**0.03**	0.18	**0.03**	6.93	**<0.001**	5.24	**<0.001**	2.16	0.26	5.63	**<0.001**
Employment status	-0.14	0.12	-0.11	0.29	-2.02	0.23	-1.90	0.25	-1.74	0.45	1.64	0.34
Smoking status	0.06	0.24	0.09	0.14	0.87	0.39	1.74	0.08	1.33	0.33	0.54	0.60
BMI categories	-0.03	0.50	-0.06	0.31	-0.44	0.61	-1.53	0.08	-0.39	0.75	-1.39	0.12
Presence of any chronic disease	0.02	0.88	-0.32	**0.01**	-1.71	0.38	0.02	0.99	0.07	0.98	1.73	0.38
Model R square		0.07		0.09		0.07		0.14		0.21		0.12
Model ANOVA p value		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001

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DISCUSSION:

In the current study, we examined HRQOL among hypertensive patients and examined the factors that may be associated with it. In bivariate analysis, QOL scores in the various domains were found to be higher among the hypertensives as compared to the non-hypertensives. Also, age was associated with all the domains, whereas marital status, smoking and presence of chronic disease were associated with all the domains except the physical health domain.

In the current study, the mean quality of life scores were 70.8 for the physical domain, 72.9 for the psychological domain, 76.7 for the social domain and 67.9 for the environmental domain. A study by Rehman et al (18), in 2016, among hypertensive patients attending primary health care centers in Jeddah found that the component scores of the physical and psychological domains were higher than the social relations and environment domain scores, which was different from the current study. These differences could be due to a variation in the study settings (tertiary care vs. primary care). Patients attending a tertiary care hospital may be more affected and consequently may have a poorer QOL than those visiting primary health care centers. Melchiors et al in their study in Brazil described results similar to the current study i.e., for hypertensives the most compromised domain was the environmental domain and the least compromised was the social domain.(21)

In the current study, a higher HRQOL score was found to be associated with hypertensives as compared to the non-hypertensives in several domains of the WHOQOL-BREF tool. Multiple linear regression showed that the hypertensive patients had a significantly higher score in the physical health, psychological health and social relationships domains as compared to the non-hypertensive group, after adjusting for the other measured variables. This was similar to the results obtained by Khosarvi et al, in Iran, in 2010, in a community based survey.(17) However, contradictory results were reported by many studies in different parts of world. Mena-Martin et al, in their community based study, in Spain, found lower quality of life scores for hypertensive participants when compared to non-hypertensives.(22) Similarly, Wang et al, in their community based study, found that hypertensive participants obtained lower scores domains than their non-hypertensive counterparts.(23) Varying results were obtained by many other studies.(24–28) These differences could be due to an unequal distribution of other factors which affect QOL, like other chronic diseases, between the non-hypertensive and the hypertensive groups.(27,23) Some of these studies had used tools other than WHOQOL-BREF for measuring HRQOL that might have been responsible for these differences.(22-29) These contradictions give an insight into the difficulties associated with measuring HRQOL among hypertensive patients and the selection of a comparison group. The several measurable and immeasurable confounding and effect modifying factors that influence HRQOL dictate the practical limitations for accurate measurements in hypertensive patients.

It the current study, it was also seen that age, marital status, education and presence of a chronic disease were found to be significantly associated with one or the other domains of HRQOL. Age was positively associated with overall quality of life, satisfaction with health and environmental domain, i.e., with increase in age the QOL scores also increased. Marital status was associated with overall quality of life, psychological and social relationship domains. Widowed/divorced participants had higher scores than married and single participants in the overall quality of life and social relationship domains. Higher education level was associated with higher QOL scores in all domains except the social relationships domain. The presence of a chronic disease was negatively associated with satisfaction with health. In their study among hypertensive patients in primary care settings in Saudi Arabia, Rehman et al found that the physical domain was associated with income and comorbidity, the psychological domain was associated with educational level and comorbidity, and the social domain was associated with number of anti-hypertensives drugs, income, comorbidity and compliance with anti-hypertensive treatment.(18) A study conducted by Oza et al among hospital attendees in India, also found that age was significantly associated with HRQOL.(13) Ogunlana et al found a negative association between education and overall quality of life and a positive association between education and mental health domain in an out-patient clinic setting.(26) Similar to our results, Ogunlana et al also showed a significant association between marital status and mental component summary but not with physical component summary.(26) Some of the factors which were found to be significant in other studies were not so in the current study. For example, employment status was significantly associated with environmental domain in a study by Poljičanin T et al in their population based study in Zagreb in 2003.(28) Certain factors like the type of health care available, which vary widely across different countries, might have had a large influence on QOL of hypertensive patients, confounding the relationship between hypertension status and the other variables. In the current study, variables related to hypertension treatment such as control status, duration of hypertension and anti-

hypertensive drug compliance were also investigated. It was seen that patients with controlled hypertension and those who were compliant to medications had higher QOL scores in most domains as compared to their counterparts.

CONCLUSIONS:

HRQOL among hypertensive patients was higher than the non-hypertensives, especially in the domains of physical health, psychological health and social relationships. For other domains, age, marital status, educational level and presence of chronic diseases were more influential.

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