Original Article

Profile and predictors of health related quality-of-life in a hypertensive population of Pakistan

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ABSTRACT

Objectives: This study aims to describe the profile and predictors of health related quality-of-life (HRQoL) in a hypertensive population of Pakistan. **Materials and Methods:** A questionnaire based, cross-sectional study was conducted among 385 hypertensive patients visiting two public hospitals in the city of Quetta, Pakistan. Demographic and disease related data was obtained from patients and their hospital records. Euroqol quality-of-life questionnaire was used to measure HRQoL while drug attitude inventory and hypertension fact questionnaire were used to measure medication adherence and HTN related knowledge respectively. Scale scores were compared with Mann-Whitney and Kruskal-Wallis test. Standard multiple regression analysis was used to identify predictors of HRQoL. **Results:** Patients in the current study reported poor HRQoL with a mean score of 0.46 ± 0.28. In terms of practical implementation, age (ß =0.298, $P < 0.001$), educational level (ß =0.493, $P = 0.025$) and knowledge score (ß =0.351, $P = 0.024$) reached level of significance in the multivariate analysis. The multiple regression analysis also found that variables such as gender, occupation, income, locality, duration of disease and medication adherence were not significantly associated with HRQoL. **Conclusion:** The results of the present study provide an evidence for a model that correlates with patients' socio-demographic information and HRQoL. The findings after implication in clinical practice can prove useful in guiding patients receiving treatment for HTN. It will also help the physicians to maintain and adjust treatment behaviors with drug or non-drug related interventions.

Key words: Health related quality-of-life, hypertension, Pakistan, predictors, profile

INTRODUCTION

Non-communicable diseases (NCDs) are the primary cause of mortality and disability around the globe.[1] In the present era, although advances in medicines have prolonged overall life line of people suffering from NCDs, a major concern is the consumption of high health-care resources, which in return have a negative impact on the quality-of-life (QOL).[1] Within this context, the concept of health related quality-of-life (HRQoL) is being used by health-care professionals to describe factors other than illness affecting human health and its status. These different health dimensions help health-care professionals to understand patients' perceptions of illness.[2] In case of NCDs, the composite nature has a traumatic effect on social and economic status of patients. Even in "controlled state of disease" the continual feeling of illness imbalances HRQoL in patients suffering from NCDs.[2] This disparity therefore, results in decreased patient satisfaction with daily life activities. Therefore, HRQoL has become an important tool

Access this article online	
Quick Response Code:	Website: www.archivepp.com
	DOI: 10.4103/2045-080X.119062

for the assessment of treatment outcomes from a patient perspective and has shaped up as an important measure of care among patients with NCDs.[3]

In Pakistan, NCDs are among the top ten causes of mortality and morbidity.[4] Estimates indicate that NCDs account for approximately 25% of total deaths. One in three adults aged >45 years suffers from hypertension (HTN). 10% of the population suffered from diabetes. Breast cancer in Pakistan is reported to be the highest among the Asian populations.[4] Furthermore as the majority of health-care costs are paid by patients themselves the cost of health-care for NCDs puts a significant strain on household budgets. Treatment for NCDs (especially in the case of diabetes, cardiovascular diseases and chronic respiratory diseases) is for life and is therefore, extremely expensive. Hence, people are pushed into poverty because they have to pay directly for health services.

One of the imperative objectives of pharmaceutical care and health interventions is either to improve or maintain the HRQoL of patients suffering from either acute or chronic conditions.[5] Epidemiological research of HRQoL in Pakistan has so far been conducted for the diseased states only[6-9] and comprehensive investigation targeting predictors of HRQoL in Pakistan is yet to be reported. This information can prove to be useful in planning interventions according to the needs of hypertensive patients. The aim of this study is to describe the predictors of HRQoL among established hypertensive patients in Quetta city, Pakistan.

MATERIALS AND METHODS

Patients, study design and settings

The study was designed as a questionnaire based cross-sectional analysis. Data was collected from two tertiary care hospitals in Quetta, Pakistan namely Sandamen Provisional Hospital and Bolan Medical Complex Hospital Both of the institutes are teaching hospitals and being public in nature bear the major health burden of the city.

A prevalence based sampling technique was used to determine the required sample size for the study. HTN is reported to affect 18% of the adult population of Pakistan therefore, 385 hypertensive patients were approached for the study.[10] Eligible participants were all adults aged 18 or over with an established medical diagnosis of HTN, familiar with Urdu (national language of Pakistan) and on antihypertensive medication for the last 6 months. Exclusion criteria were dementia, pregnancy and immigrants from other countries.

The study was approved by the Joint Ethical Research Committee of Sandamen Provisional Hospital and Bolan Medical Complex Hospital (EA/FS/1021-20). Written informed consent was also obtained from all participants before their enrolment in the study.

Data abstraction

The hypertension fact questionnaire, drug attitude inventory-10 and EuroQol quality-of-life scale (EQ-5D) were used to assess HTN related knowledge, medication adherence and HRQoL, respectively. Demographic and disease related data was obtained from patients and their hospital records. The questionnaires were pilot-tested with 40 hypertensive patients to indemnify the validity and internal consistency of the study instruments. Data from the pre-test evaluation was excluded from the final analysis.

Statistical analysis

Descriptive statistics were used to describe demographic and disease characteristics of patients. Percentages and frequencies were used for the categorical variables while means and standard deviations were calculated for the continuous variables. The characteristics of the whole sample, HTN knowledge scores, medication adherence scores and HRQoL were presented.

The Kolmogorov-Smirnov test was used to establish the nature of the data and non-parametric statistical tests were used accordingly. Mann-Whitney U test and Kruskal-Wallis test were used to identify the differences in the knowledge, medication adherence and HRQoL scores between groups. Bonferroni *post hoc* procedure was applied if significant differences were observed using the Kruskal-Wallis test. The association between HRQoL scores, socio-demographic, HTN related knowledge and medication adherence were determined using standard multiple linear regression analysis. The HRQoL scores were taken as the outcome variable while socio-demographic, knowledge and medication adherence scores were taken as predictor variables. All analyses were performed using the SPSS version 16.0 (SPSS Inc., Chicago, IL).

RESULTS

Demographic information

The demographic characteristics of the study patients were presented in Table 1. The mean age of patients'

Table 1: Characteristics of survey respondents (*n*=385)

Characteristics	Frequency	Percentage
Age (mean±SD)=39.02±6.59		
18-27	48	12.5
28-37	186	48.3
38-47	128	33.2
≥48	23	6.0
Gender		
Male	265	68.8
Female	120	31.2
Education		
Illiterate	9	2.3
Religious	62	16.1
Primary	7	1.8
Matric	51	13.2
Intermediate	51	13.2
Bachelors	154	40.0
Masters	51	13.2
Occupation		
Jobless	97	25.2
Government official	78	20.3
Private job	134	34.8
Businessman	76	19.7
Income*		
Nil	97	25.2
<Pakistan rupees 5000	2	0.5
5001-10000	22	5.7
10001-15000	104	27.0
≥15001	160	41.6
Locality		
Urban	289	75.1
Rural	96	24.9
Duration of disease (mean±SD)=3.01±0.939		
Less than 1 year	26	6.8
1-3 years	89	23.1
3-5 years	124	32.2
5 years	146	37.9

*1 Pk Rs=0.01172 $US

standard deviation (SD) was 39.02 (6.59). The mean (SD) duration of HTN was 3.01 ± 0.93 years. In terms of education, 40% (*n* = 154) of them had a bachelor's degree. A total of 34.8% (*n* = 134) of patients were working in the private sector. Approximately, 41% (*n* = 140) had a monthly income of more than 15,000 Pakistan rupees (Pk Rs) (1 Pk Rs = 0.01172 $US) with 75.1% (*n* = 289) living in urban residency.

HTN knowledge scores

Overall mean knowledge score was 8.03 ± 0.42 and the median score was 8. Out of the 385 patients 146 (37.9%) were within the poor knowledge range, 236 (61.3%) moderate and only 3 patients (0.8%) showed adequate general knowledge about HTN. Poor knowledge was apparent in responses to questions relating to onset and management and dietary control of HTN. Knowledge scores had a significant association with occupation, education, income (Kruskal-Wallis test) and locality (Mann-Whitney test). Knowledge score increased as the educational level of patients increased. In addition, people working in the government sector and with urban residencies showed remarkable difference in knowledge toward HTN as compared with the other groups as shown in Table 2.

Medication adherence scores

The overall mean medication adherence score was −1.74 ± 2.154 and median score was −2. Out of 385 patients, 249 (64.7%) were categorized as poor adherent and 136 (35.3%) as moderate adherent to their therapies. No patient was considered good adherent. Area of residence was the only variable significantly associated with medication adherence. Patients belonging to the rural area were reported as more adherent as compared with their counterparts [Table 2].

HRQoL scores

Table 2 reflects the association between demographic variables and HRQoL scores. The mean EQ-5D descriptive score calculated was 0.4674 ± 0.284 and EuroQol visual analog scale score 63.970 ± 6.621. A total of 29 different EQ-5D health states were described by patients. The majority of the participants (*n* = 112, 29.1%) indicated no problems in the second and third domain while moderate problems in the first, fourth and fifth domain (mobility "first", self-care "second", usual activities "third", pain/discomfort "fourth" and anxiety/depression being the "fifth" domain). There was not a single patient who stated no problems in all five domains.

No significant difference was reported when gender, income and duration of disease were kept into consideration. On the other hand, significant difference was observed when age, education, locality and occupation were analyzed. In between the educational variable, illiterate group had significant relation with the primary, intermediate and bachelor's level of education. In addition, significant difference was found in an occupation where respondents with private jobs had significant relation with those who were jobless and government officials. In addition, participants falling into the age group of >48 reported poor HRQoL.

By applying the entered method, a significant model emerged ($F_{10, 375} = 40.04$, $P < 0.05$, adjusted $R^2 = 0.488$).

Table 2: Demographic characteristics of the study patients with differences in knowledge, medication adherence, EQ-5D and EQ-VAS scores (*N*=385)

Variables	HFQ scores		DAI-10 scores		EQ-5D scores	
	Mean (SD)	*P*	Mean (SD)	*P*	Mean (SD)	*P*
Age*						
18-27	8.02 (1.56)	0.556	−1.62 (2.20)	0.748	0.591 (0.184)	<0.001
28-37	8.12 (1.63)		−1.86 (2.16)		0.500 (0.257)	
38-47	7.96 (1.79)		−1.62 (2.12)		0.410 (0.314)	
≥48	8.03 (1.67)		−1.74 (2.15)		0.257 (0.322)	
Gender¥						
Male	8.15 (1.57)	0.065	−1.77 (2.13)	0.817	0.467 (0.281)	0.705
Female	7.77 (1.86)		−1.68 (2.20)		0.466 (0.291)	
Education*						
Illiterate	7.11 (1.96)	<0.001	−1.56 (2.60)	0.488	0.254 (0.335)	<0.001
Religious	6.65 (1.40)		−1.29 (2.58)		0.300 (0.346)	
Primary	7.43 (1.71)		−0.86 (2.26)		0.558 (0.180)	
Matric	7.39 (1.57)		−1.73 (2.04)		0.437 (0.287)	
Intermediate	8.29 (1.39)		−1.80 (1.66)		0.523 (0.259)	
Bachelors	8.46 (1.41)		−1.84 (1.66)		0.529 (0.231)	
Masters	9.06 (1.71)		−2.08 (1.69)		0.483 (0.281)	
Occupation*						
Jobless	7.14 (1.62)	<0.001	−1.51 (2.45)	0.653	0.433 (0.298)	0.015
Government official	8.87 (1.38)		−1.97 (1.86)		0.479 (0.276)	
Private job	8.30 (1.53)		−1.79 (1.96)		0.529 (0.237)	
Businessman	7.84 (1.72)		−1.71 (2.34)		0.388 (0.326)	
Income*						
Nil	7.14 (1.62)	<0.001	−1.51 (2.45)	0.610	0.433 (0.298)	0.098
<Pk Rs 5000	7.50 (0.70)		0.0 (2.82)		0.421 (0.332)	
5001-10000	8.23 (2.13)		−2.18 (2.30)		0.562 (0.198)	
10001-15000	8.47 (1.40)		−1.88 (1.98)		0.523 (0.238)	
≥15001	8.27 (1.62)		−1.75 (2.04)		0.439 (0.306)	
Locality¥						
Urban	8.40 (1.54)	<0.001	−1.87 (2.14)	0.044	0.511 (0.254)	<0.001
Rural	6.93 (1.58)		−0.135 (2.16)		0.335 (0.327)	
Duration of disease*						
Less than 1 year	7.77 (1.47)	0.824	−2.15 (2.32)	0.774	0.588 (0.182)	0.703
1-3 years	8.01 (1.54)		−1.62 (2.23)		0.515 (0.255)	
3-5 years	8.04 (1.72)		−1.74 (2.07)		0.473 (0.266)	
>5 years	8.09 (1.75)		−1.74 (2.15)		0.411 (0.317)	

*Kruskal-Wallis test, ¥Mann-Whitney U test. HFQ=Hypertension fact questionnaire, DAI=Drug attitude inventory, EQ-5D=EuroQol quality-of-life scale, EQ-VAS=Euroqol visual analogue scale, Pk Rs=Pakistan rupees

Age, educational level and knowledge toward HTN emerged as the predicting factors for HRQoL. The multiple regression analysis also found that gender, occupation, income, locality, duration of disease and medication adherence were not significantly associated with HRQoL.

DISCUSSION

The current study was undertaken to highlight the profile and predictors of HRQoL in a hypertensive population of Pakistan. Many studies have analyzed HRQoL among hypertensive patients by using a multivariate model; however, such studies are often reported from the developed nations.[11-13] Therefore, these studies are unable to present a true picture of HRQoL from a developing country like Pakistan.

Profile of HRQoL in hypertensive patients

Patients in this study reported poor HRQoL with a mean score of 0.467 ± 0.284. This finding is the line with what is accounted by other studies where HTN was reported to negatively affect HRQoL.[14,15] Age, education, occupation and locality were reported to associate significantly with HRQoL. These findings are also comparable with the existing literature. While Khosravi *et al*. reported a significant relationship of education and income with HRQoL,[16] Pappa *et al*.

highlighted age as the only factor with a significant relationship with HRQoL.[17] Furthermore, Baune and Aljeesh[18] reported income and gender, whereas Goins *et al*. concluded that age, sex, education, annual household income, employment status, HTN and obesity were significant to HRQoL.[19] However, the results were unable to present a significant association among duration of disease and HRQoL which is against to what is discussed by Soni *et al*. in 2010.[20] A possible explanation toward this difference can be attributed to the characteristics and duration of HTN itself. Being asymptomatic in nature, the impact of HTN on HRQoL is usually less adverse as compared with other chronic diseases in early years.[14] The mean duration of HTN in the current study was 3.01 ± 0.93 years; hence it is hypothesize that this time period is unable to produce a significant effect on HRQoL. Supporting our claim, Papadopoulos *et al*. (2007) reported that HRQoL was largely impaired among patients with history of diabetes mellitus for more than 10 years.[21]

Predictors of HRQoL in hypertensive patients

Regarding socio-demographic predictors of HRQoL, a non-significant relationship was observed between gender, income, locality, medication adherence and HRQoL. This is in line to what is reported earlier in patients with cardio vascular diseases.[22,23] In terms of practical implementation of the current study results, age, educational level and knowledge score reached level of significance in the multivariate analysis. It can be hypothesized that patients having higher levels of education and better disease related knowledge experience less deterioration in HRQoL as compared with other patients. However, with less beta values for age and knowledge scores, we can predict that these variables might be of less clinical importance in imparting an effect on overall HRQoL. The relationship between education and HRQoL provides significant association with highest influencing beta value; hence, predicting an increase in overall HRQoL with an increase in the educational status of patients.

In literature, the association between education and health is well-known and persistent. In addition, significant results are presented between more and less educated groups.[24] These associations are explainable using the theoretical model of "fundamental causes of disease hypothesis."[25] The model reports that education is responsible in providing a wide range of serviceable resources to the individual that are used to his/her health advantage. Education also develops interest and involvement of patients in improving one's own health, which is a key determinant of a successful medical treatment. Education have a direct effect on health and health behaviors as it imparts direct knowledge about health and health behaviors, resulting in a shift of health production function. The indirect effects are broader in the context of health assessment and promotion. The most frequently-mentioned is the effect of education on labor market opportunities with higher rates of employment and increased earnings. This improves the current health status by increasing the affordability of health improving goods, access to medical care or by reducing income volatility. More educated people work with more patient are likely to engage in healthier.

It is a common observation that better educated people are less likely to develop chronic conditions, or are in "controlled" status. In addition to pharmacotherapy, better educated are more likely to adapt life style modification and preventive measures, which results in an improvement of HRQoL. Within this context, Cutler and Muney reported that an additional 4 years of education lowers 5-year mortality by 1.8% points, reduces the risk of heart disease by 2.16 and the risk of diabetes by 1.3% points. The same applied to both developed and developing countries worldwide where more educated were reported to live longer with better health conditions and status.[24]

CONCLUSION

The results of the present study provide an evidence for a model that correlates with patients' socio-demographic information and HRQoL. The findings after implication in clinical practice can prove useful in guiding patients receiving treatment for HTN. It will also help the physicians to maintain and adjust treatment behaviors with drug or non-drug related interventions.

Age, education and disease related knowledge were reported as significant in the model. It is concluded that with an increase in age, education and disease related knowledge, hypertensive patients can improve their self-management activities, increase awareness toward disease and hence resulting in attaining controlled status of HTN. Once controlled, patients can feel advancement in their HRQoL and a change in their daily life activities and routine. Therefore, whenever HRQoL is suspected to be poor in hypertensive patients, age, educational status and disease related knowledge should be appraised before designing a therapeutic plan for the patient.

ACKNOWLEDGMENTS

The authors acknowledge the patients and the hospital practicing staff for the completion of the study.

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How to cite this article: Saleem F, Hassali MA, Shafie AA, Ul Haq N, Farooqui M, Aljadhey H. Profile and predictors of health related quality-of-life in a hypertensive population of Pakistan. Arch Pharma Pract 2013;4:98-103.

Source of Support: Nil. **Conflict of Interest:** None declared.