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THE HEATH RELATED QUALITY OF LIFE (HRQOL) FOR HYPERTENSIVE PATIENTS IN EASTERN PROVINCE IN SAUDI ARABIA: CROSS SECTIONAL STUDY

Dhfer Mahdi Alshayban ¹, Royes Joseph ¹, Noura M. Alajmi ¹, Lujain Y. Almarzooq ¹, Wijdan N. Altamimi ¹ and Faheem Hyder Pottoo ^{*2}

Department of Pharmacy Practice ¹, College of Clinical Pharmacy, Imam Abdulrahman Bin Faisal University, P. O. BOX 1982, Dammam, 31441, Saudi Arabia.

Department of Pharmacology ², College of Clinical Pharmacy, Imam Abdulrahman Bin Faisal University, P. O. BOX 1982, Dammam, 31441, Saudi Arabia.

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Correspondence to Author: Dr. Faheem Hyder Pottoo

Assistant Professor,
Department of Pharmacology,
College of Clinical Pharmacy
Imam Abdulrahman Bin Faisal
University, Dammam, Saudi Arabia.

E-mail: fahihyder@gmail.com

ABSTRACT: Background: Hypertension is associated with the flow of blood under high pressures, and is a risk factor for coronary heart disease. **Methodology:** We designed a prospective observational study that included 280 participants to investigate the effect of hypertension on the health-related quality of life (HRQOL) for hypertensive patients in the eastern province of KSA. To measure HRQOL, this study used EQ-5D-5L which consists of five dimensions that are further divided into five levels of severity. **Results:** Among the normotensive participants, 77%, 96%, 66%, 38%, and 44% were agreed as having no problem in terms of self-care, anxiety or depression, usual activities, mobility, and pain or discomfort respectively; whereas among the hypertensive participants, these were 36%, 79%, 20%, 21%, and 31% respectively. **Conclusion:** We concluded that health-related quality for hypertensive patients is significantly affected by HTN. Therefore, great attention must be paid to enhance their quality of life to avoid any future complications.

INTRODUCTION: The force that blood exerts against the walls of arteries after ejection from the heart is referred as blood pressure. The flow of blood at higher than normal pressures through blood vessels or arteries is referred to as high blood pressure or hypertension (HTN) ¹. Hypertension is a risk factor for coronary heart disease ^{2, 3}. Mortality and morbidity from hypertension have reached epidemic proportions worldwide.

It has been estimated that 874 million adults globally have systolic blood pressure (SBP) of 140 mm Hg or higher. A recent study from Saudi Arabia found 15.2% of the adult population as hypertensive of whom 57.8% were unaware of this diagnosis ⁴. It is forecasted that HTN would grow by 24% in advanced countries and 80% in developing countries by the year 2025 ⁵.

Most drugs have significant limitations, such as low bioavailability, relatively short half-life, and low permeability, the experimental demonstration has revealed that nanocarriers can be successfully utilized for delivering drugs to improve biopharmaceutical performance of anti-cancer, anti-infective, anti-Alzheimer's, anti-epileptic, anti-hypercholesterolemic, antioxidants as well as anti-

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hypertensive drugs⁶⁻¹⁰. The utility of the QBD approach to continuously monitor and improve the quality of the final formulations^{11,12}, has improved the compliance of patients towards drug regimen, and are thus valuable solutions in the diagnosis as well as management of hypertension^{13, 14}. Nanoemulsion system of olmesartan medoxomil (OM) reduced adverse effects and increased bioavailability¹⁵ and nanoparticle-loaded aliskiren provided better cardioprotective effects. Nevertheless the epidemic of hypertension and its complications are increasing, thereby efforts should be directed toward primary prevention through advocating a healthy lifestyle and controlling other cardiovascular risk factors¹⁶.

HRQOL (Health-related quality of life) is the health status (physical, emotional and social) self-reported by individuals. It assesses the impact of disease, disability, or disorder overtime on individual's well-being¹⁷. QOL (Quality of life) is a key measure when analyzing hypertensive treatment outcomes¹⁸. Al-Ghamdi *et al.*, 2002 utilized the Arabic version of SF-36, to determine QoL in a sample of hypertensive Saudi patients and reported QOL of hypertensive patients was considerably impeded in contrast to the control group¹⁹.

The study from Jeddah reported that old age, low educational level, unemployment, low income, long disease duration and frequent use of antihypertensive medications and coexistence of comorbidities are predictors for poor QOL²⁰. By using data from QOL, the clinician can directly govern the influence of the therapeutic regimen on the patient, enhance compliance, and minimize the patient's risk for CV complications²¹. Many validated questionnaires have been used to assess QOL, such as 36-Item Short Form (SF-36), the Nottingham health profile (NHP), the Sickness Impact Profile (SIP), the Quality of Well-Being (QWB) scale, the Health Utilities Index (HUI) and the EuroQol Instrument (EQ-5D) which are generic and can be used for all diseases²². Additionally, Mini-Questionnaire of Quality of Life in Hypertension (MINICHAL) which is disease-specific and used only for hypertension is also reported in some studies²³. The objectives of this study were to examine the impact of HTN on HRQOL of hypertensive patients using EQ-5D-5L.

METHODOLOGY:

Study Setting and Subjects: This survey was conducted from November 2018 to March 2019 among 140 HTN patients and 140 subjects without HTN. Patients, who were diagnosed with HTN for at least 1 year, were conveniently recruited from King Fahad Hospital of the University, which is a major tertiary hospital in the eastern region of KSA; whereas the subjects without HTN were selected from the persons who accompanied the patients. Subjects who were aged at least 18 years were considered for this study if they were willing to participate and provide written informed consent. The study was approved by the Institutional Review Board and the ethical committee at Imam Abdulrahman Bin Faisal University.

Data Collection: The respondents were interviewed in Arabic, and validated the translated version of structured questionnaires (from English to Arabic) was completed under the following sections:

Socio-demographic and Clinical Characteristics:

The data were obtained on participants' socio-demographic and clinical characteristics such as gender, age, education status, employment status, monthly income, marital status, presence of other co-morbidities, family history of HTN, presence of HTN and current use of HTN medications (type and number).

Assessment of HRQOL: To measure HRQOL, the EQ-5D-5L was utilized, which consisted of five dimensions, further divided into five levels of severity. The five dimensions: i) mobility, ii) self-care, iii) usual activities, iv) pain/discomfort and v) anxiety/depression of EQ-5D are self-reported by patients. Each dimension has a five-level scale (no problems, slight, moderate, severe and extreme) scored from 1 to 5. Five-digit codes for the HRQOL of each patient are obtained from the score digits; there are 3125 possible sets of values, called health states, for EQ-5D-5L. The health states would range from 11111 (perfect health) to 55555 (worst health) and can be converted into a single weighted index score (EQ-5D index) using population preference scores. We used the values derived from the UK general population survey to derive the EQ-5D index²⁴. Thus, a health state

yields an HRQoL score of between -0.285 and 1, where 1 represents perfect health, 0 represents death, and a score of less than 0 represents health states worse than death.

Data Analysis: The socio-demographic and clinical attributes of hypertensive's and normotensives were compared using chi-square for categorical variables. The comparison of EQ-5D index between hypertensive's and normotensives was accomplished using t-test. A P-value of less than 0.05 was considered as statistically significant. We used SPSS Statistics 24.0 to analyze the data.

RESULTS:

Socio-demographic and Clinical Characteristics of Participants: As reported in **Table 1**, distribution of gender, age, education, employment and monthly income of participants were not significantly different between hypertensive and normotensive participants. However, more widowed/divorced cases were included in the hypertensive group than that among the normotensive group (p-value <0.001) **Table 2** presents clinical characteristics between hypertensive and normotensive individuals.

TABLE 1: COMPARISON OF BASELINE CHARACTERISTICS BETWEEN HYPERTENSIVE AND NORMOTENSIVE INDIVIDUALS

| | | Hypertensive | Normotensive | P-value |
|----------------|-------------------------|--------------|--------------|---------|
| Gender | Male | 60 (42.9%) | 47 (33.6%) | 0.110 |
| | Female | 80 (57.1%) | 93 (66.4%) | |
| Age | 18-29 | 17 (12.1%) | 29 (20.7%) | 0.153 |
| | 30-49 | 49 (35%) | 45 (32.1%) | |
| | >=50 | 74 (52.9%) | 66 (47.1%) | |
| Education | Primary school or lower | 19 (13.6%) | 17 (12.1%) | 0.237 |
| | Secondary-high school | 60 (42.9%) | 74 (52.9%) | |
| | Undergraduate or higher | 61 (43.6%) | 49 (35%) | |
| Employment | Student | 11 (7.9%) | 17 (12.1%) | 0.113 |
| | Employed | 68 (48.6%) | 54 (38.6%) | |
| | Unemployed | 40 (28.6%) | 54 (38.6%) | |
| | Retired | 21 (15%) | 15 (10.7%) | |
| Monthly income | <5,000 | 41 (29.3%) | 55 (39.3%) | 0.253 |
| | 5,000-10,000 | 36 (25.7%) | 30 (21.4%) | |
| | 10,000-20,000 | 43 (30.7%) | 42 (30%) | |
| | >20,000 | 20 (14.3%) | 13 (9.3%) | |
| Marital status | Single | 25 (17.9%) | 30 (21.4%) | <0.001 |
| | Married | 76 (54.3%) | 97 (69.3%) | |
| | Widowed/Divorced | 39 (27.9%) | 13 (9.3%) | |

TABLE 2: COMPARISON OF CLINICAL CHARACTERISTICS BETWEEN HYPERTENSIVE AND NORMOTENSIVE INDIVIDUALS

| | | Hypertensive | Normotensive | P-value |
|-----------------------------------|---------------------------------|--------------|--------------|---------|
| Chronic conditions other than HTN | No | 29 (20.7%) | 94 (67.1%) | <0.001 |
| | Yes | 111 (79.3%) | 46 (32.9%) | |
| Family history of hypertension | No | 26 (18.6%) | 98 (70.0%) | <0.001 |
| | Yes | 114 (81.4%) | 42 (30.0%) | |
| Duration of hypertension | None | 0 (0%) | 140 (100%) | |
| | 1-5 years | 53 (37.9%) | | |
| | 6-10 years | 42 (30%) | | |
| | 10-16 years | 45 (32.1%) | | |
| Number of medications for HTN | None | 0 (0%) | 140 (100%) | |
| | One medication | 36 (25.7%) | | |
| | Two medications | 72 (51.4%) | | |
| | Three or more medications | 32 (22.9%) | | |
| Medications take for HTN | ACE inhibitor | 17 (12.1%) | | |
| | ARB inhibitor | 10 (7.1%) | | |
| | ACE inhibitor & diuretics | 17 (12.1%) | | |
| | ARB inhibitor & diuretics | 15 (10.7%) | | |
| | ACE inhibitor + CCB | 32 (22.9%) | | |
| | ARB inhibitor + CCB | 5 (3.6%) | | |
| | ACE inhibitor & diuretics + CCB | 31 (22.1%) | | |
| | ARB inhibitor & diuretics + CCB | 13 (9.3%) | | |

In the study sample, 79% of hypertensive patients had other chronic conditions, whereas the proportion was 33% among the normotensive participants (p-value <0.001). The proportion of subjects with a family history of HTN was also comparatively high among the hypertensive group (p-value <0.001).

Health-Related Quality of Life using EQ-5D-5L: **Fig. 1** shows the patient's response over five levels in each of five domains of EQ-5D. Among the normotensive participants, 77%, 96%, 66%, 38%, and 44% agreed as having no problem in terms of

self-care, anxiety or depression, usual activities, mobility, and pain or discomfort respectively; whereas among the hypertensive participants, these were 36%, 79%, 20%, 21%, and 31% respectively.

As presented in **Fig. 2**, the mean EQ-5D index score was lower among the hypertensive group compared to the normotensive group (p-value <0.001). As reported in **Fig. 3**, proportion of subjects with VAS score of 80 or higher was also lower among the hypertensive group (p-value <0.001).

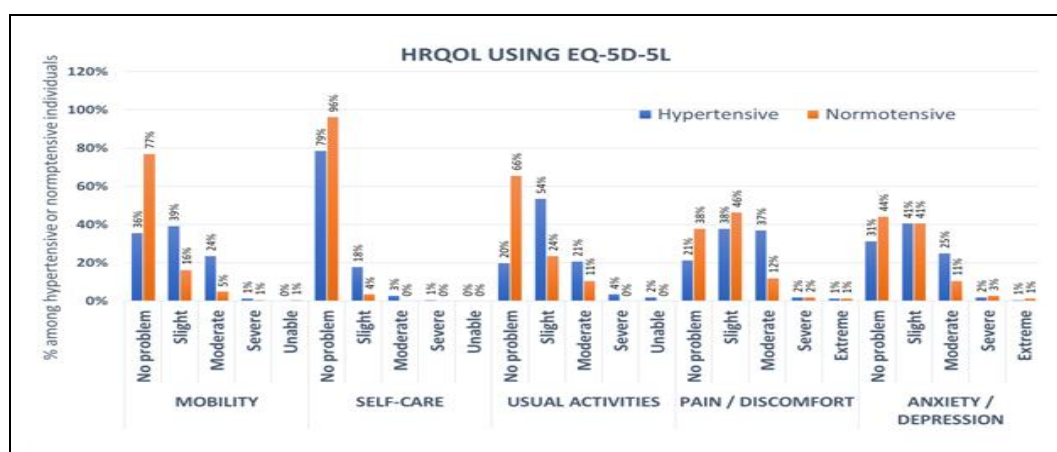


FIG. 1: HEALTH-RELATED QUALITY OF LIFE MEASURED USING EQ-5D-5L SCALE

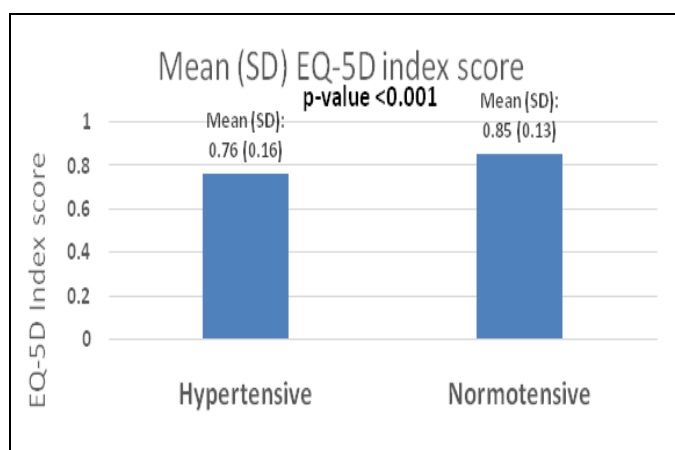


FIG. 2: HEALTH-RELATED QUALITY OF LIFE: MEAN EQ-5D INDEX SCORE

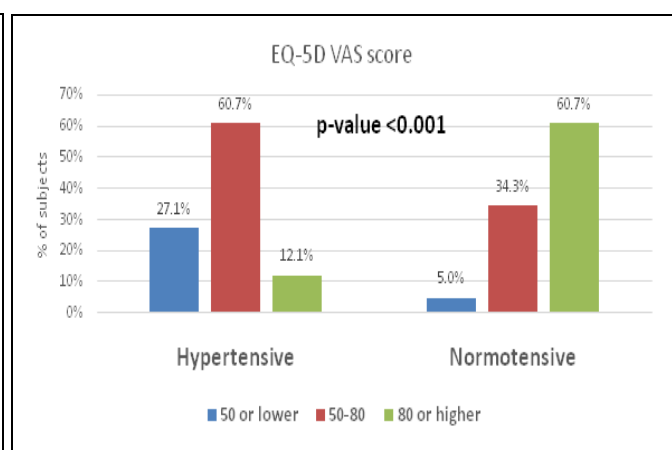


FIG. 3: HEALTH-RELATED QUALITY OF LIFE: VAS SCORE

DISCUSSION: This was a prospective observational study that included 280 participants to explore the effect of hypertension on QOL in hypertensive patients living in the eastern province of KSA. To the best of our knowledge, this is the first study that assesses how this disease may influence HRQOL for those patients. This study displayed that compared to non-hypertensive participants, hypertensive patients reported

significantly lower scores in each of the EQ-5D domains which may prove hypertension can affect the HRQOL. This study showed that positive family history for hypertension in hypertensive patients is attributable risk factor to hypertension disease and associated with excessive cardiovascular reactivity and attributable risk factor to hypertension compared to normotensive participants²⁵.

Comorbidities such as diabetes, dyslipidemia, angina pectoris, myocardial infarction, and stroke are common among hypertensive patients²⁶. In addition, this study showed that hypertensive patients with co-morbidities have lower scores in specifically two domains of EQ-5D questionnaire which are activity daily living and pain sensation compared to normotensive participants that contribute to their lower HRQOL^{26, 27}. In this study, we found that in every EQ-5D domain hypertensive patients had lower scores than normotensive participants, indicating that HRQOL is significantly affected by hypertension^{25, 26, 28}.

In addition, our research shows that hypertensive patients have lower functional capacity compared with normotensive participants which were consistent with other studies. It indicates that high blood pressure has a significant impact on physical activity which explains the lower scores in three domains which are mobility, self-care and usual activity^{25, 26}. When we compared in the last two domains which are the pain/discomfort domain and the anxiety/depression domain between the hypertensive participants and normotensive participants we found that normotensive have lower pain/discomfort and anxiety/depression than hypertensive participants.

The other results showed a positive relationship between high blood pressure with the pain/discomfort domains and the anxiety/depression domains which were consistent with other studies^{17, 29, 30}.

CONCLUSION: This population-based study found that Hypertension is associated with lower HRQOL, particularly in physical domains which are consist of mobility, self-care, and usual activities. HRQOL in hypertensive respondents is lower than normotensive respondents. Complications such as diabetes, dyslipidemia, angina pectoris, myocardial infarction, and stroke are common among hypertensive patients in addition to duration of hypertension act as major predictor of HRQOL that affects physical and mental health in the hypertensive respondents and leads to lower HRQOL.

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