Original article

Hypertension and Health-Related Quality of Life: A Community Based Epidemiological Study in an Egyptian Village

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ABSTRACT

Background: High blood pressure is the most important modifiable risk factor for stroke, associated with 54% episodes of stroke worldwide and 45% of Ischemic Heart Disease deaths are attributable to high systolic blood pressure.

Aim of the work: To identify the prevalence rate of hypertension among adult inhabitants of Badaway village, Al-Mansoura District, Al-Dakahlia Governorate, to identify the epidemiological characteristics and risk factors of hypertension compared to non-hypertension individuals, to assess the (HRQOL) among hypertensive patients compared to non- hypertension individuals, and to evaluate the effect of an educational health program on health-related quality of life (HRQOL) among hypertensive patients.

Subjects and methods: The study was conducted on 1100 of adult populations aged 30 years and older living at the studied village, A cross sectional study using questionnaire to assess the participant's HRQOL by SF-36 questionnaire, and interventional study included application of intervention program on hypertension group.

Results: The total prevalence of hypertension was 28.2% of the total studied sample. The important predictor's factors were overweight, obese, older age, unmarried status, employment, and high socioeconomic level. The mean of Physical Component Summary and Mental Component Summary and their items of HRQOL were statistically higher among the normal group compared with hypertension group. The intervention program has a significant effect on improving means of PCS and MCS of HRQOL.

Conclusion: Application of simple health education intervention program can lead to significant positive impact on knowledge, behaviors and HRQOL of hypertension patients.

Keywords: Hypertension; Quality of Life; Health program; Educational intervention; Rural.

INTRODUCTION

The global prevalence of hypertension in adults aged 18 years and over was around 22%[1]. In Egypt (2016) MOHP published that 17% of women and men were classified as hypertensive[2]. The problem is complicated by the low awareness rates, only 38% of hypertensive Egyptians were aware of having high blood pressure, only 24% were receiving treatment, whereas control rates (<140/90 mmHg) were 8%[3].

Health-related quality of life (HRQOL) has become increasingly important in clinical and public health research over the last 15 years [4]. Health- related quality of life (HRQOL) provides a multi-dimensional perspective encompassing a patient's emotional, physical, and social functioning[5]. HRQOL Measuring can help to determine the burden of preventable disease, injuries, and disabilities, and it can provide valuable new insights into the relationships between HRQOL and risk factors[6]. There are many general instruments available to measure the quality of life, but 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 a variety of health conditions, including hypertension[7].

The SF-36 measures eight scales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). The 8 subscales contribute to two, resulting in component summaries: a mental component summary (MCS) and a physical component summary (PCS). Both PCS and MCS scores range from 0 to 100, representing the worst to better health. Higher scores indicate better HRQOL[8].

Previous investigations have shown that clinical and sociodemographic variables affect the patient's quality of life, reporting that in hypertension patients there is a decrease in it[9]. However, some studies have concluded the opposite and state that there is no decrease in the quality of life of hypertension patients[10].

Several studies have demonstrated that hypertension has a strong negative impact on HRQOL[11]. There is a lack of information on the role of a health education intervention on the quality of life in patients with hypertension. Therefore, it can be hypothesized that imparting health education to patients through a well-designed intervention can result in better awareness, behaviors toward the disease and improved HRQOL[12]. Community physicians can play an important role to help hypertension patients to gain knowledge and change attitudes necessary to live with controlled hypertension and good HRQOL[13]. From this point of view, this community based epidemiological research work was conducted to investigate the current topic.

AIM OF THE WORK

To identify the prevalence rate of hypertension among adults in Badaway village, Al- Mansoura District, Al-Dakahlia Governorate. In addition, to evaluate the effect of an educational health program on HRQOL among hypertensive patients

PATIENTS AND METHODS

This research deals with hypertension and HRQOL and was performed from the beginning of June 2017 to November 2019 at Badaway Village, Al-Mansoura District, Al- Dakahlia Governorate.

Sampling design: The study involved two sampling methods:

A. Sample for the preliminary assessment, the studied village was divided into eight separate clusters and then randomly selected four clusters using simple random sampling technique. Based on the inclusion and exclusion criteria, the selected sample size was taken from the selected four clusters by house to house method to Identify the prevalence rate of hypertension and comparison of socio-demographic variables, risk factors and HRQOL domains between hypertension and normotension groups.

Inclusion criteria: Participants with age 30 years and older. Exclusion criteria: severe psychiatric or behavioral disorders, pregnant females, participants who are less than 30 years old and participants with current chronic disease affecting HRQOL.

The sample size was calculated using StatCalc software, Epi-info version 7 based on the following assumption: The total number of populations in the studied village was 58695, The number of populations with age 30 years and over was 28550. Prevalence of hypertension by 50% (to give maximum sample size) and Confidence level 97%. This was given a minimum sample size of 1066; to compensate for any incomplete questionnaire and

sampling error, this number was rounded to 1100.

B. Sample for an intervention program: A sub-sample of 200 hypertensive patients was drawn from the study patients by simple random sampling, then the sub-sample was randomly divided into two equal groups. The researcher taught the health education program only to the experimental group (100 patients) while the control group (100 patients) did not. The experimental group was divided into 10 small groups; each group (10 hypertensive patients) attended 4 sessions and the total number of sessions was around 40 sessions over 2 months for the whole experimental group.

The Interventional patient's Program:

A group-based educational intervention session on hypertension was conducted by a researcher at the village's family health center and included the teaching program schedule and PowerPoint, posters and copyright disk (CD) videos to meet the overall goals of the program. The hypertensive patients in the intervention group were contacted by telephone to attend the intervention program. The length of each session ranged from 40-60 minutes, starting with 5 minutes warming up to 20 minutes of lecture, followed by group discussion for questions and answers for 15-30 minutes. The content of the program and the choice of methods of teaching were based on the age, educational level and needs of the patient, individually or in groups. The researcher prepared an informative PowerPoint poster, and videos on copyright disk, CD using simple language and illustrative images to present information to patients in a simple way.

This study was divided into two phases:

1. Cross-sectional study: was carried out to determine the following items by completing questionnaire sheets; socio-demographic variables, hypertension-related data, hypertension prevalence and also to measurement of HRQOL by the short form 36 Questionnaire.

2. Interventional study (A health education program): the researcher educated and informed the experimental group on the health education program while the control group was not. after six months, evaluation of the program was done using the same pretest questionnaire.

Statistical analysis of the data: Data was analyzed by using statistical package for social science [SPSS] software, version 25 [IBM®SPSS®, USA, Chicago, IL]. Quantitative data were tested for normality by using the Kolmogorov-Smirnov test and expressed as means with standard deviation or medians with ranges according to data distribution. Categorical data were presented as number and percentages. P <0.05 is considered significant. Groups were compared by Chi-Square test and Student [t] test. Binary logistic regression analysis was conducted to identify independent significant hypertension predictors, and independent variables had p-value ≤ 0.05 candidates for multiple logistic regression analyses with Odds ratios (OR) at 95% confidence intervals (CI) was calculated and statistical significance were accepted at the 5% (P-value ≤ 0.05).

RESULTS

The current study showed that hypertension was present in more than one fourth (28.2 %) of the study participants. The prevalence of hypertension among females was slightly higher than males, (29.2%) compared to (26.8%) respectively [Table 1]. The current study revealed that after the addition of significant predictors in the logistic regression model: age groups (60-69 and > 70 years), marital status, basic education, jobs, socio-economic levels (middle and high levels) and BMI (overweight and obese groups) continued a significantly associated predictor (P=0.001). In addition, the age group (40-49 and 50-59 years) and educational levels (high and university) were still not significantly associated to predictors. [Table (2)]. The current study also revealed that, after using the model of multiple logistic regression: overweight, obese groups, and high socio-economic levels, there are significant risks of developing hypertension compared to their reference groups (P=0.001). Compared to their reference groups, marriage and employment also have a significantly higher risk of having hypertension (P=0.001). Overweight, high socio-economic status, older age, working, unmarried and obese were (9.4, 5.3, 3.2, 3.2, 2.5 and 2.3 times respectively) significantly more risky to develop hypertension compared to their reference group (P=0.001 & P=0.001) [Table 2]. The physical (PCS) and mental (MCS) component summary and their items of HRQOL were statistically higher in the normal group compared with the hypertension group (P=0.001) [Table 3]. As a result of the intervention program, the physical (PCS) and mental (MCS) component summary and their items of

HRQOL were enhanced and significantly higher in the experimental group compared to the control group (P=0.001) [Table 4 and Figure 1]

Table [1]: Prevalence of hypertension in the study sample according to sex

Sex	Total studied sample (No.)	Hypertension (No.)	Prevalence (%)
Male	481	129	26.8
Female	619	181	29.2
Total	1100	310	28.2

Table [2]: Multiple logistic regressions of risk factors associated with hypertension as predictors of the occurrence of hypertension among affected group

| Predictors	Hypertension (N=310) %	Normal (N=790) %	Odds ratio (95% CI)	P-value
Age (years)				
30-39	8.1	11.3	1.0 Reference	-------
40-49	11.6	21.5	1.01 (0.48-2.11)	0.988
50-59	11.9	27.6	0.59 (0.29-1.21)	0.153
60-69	33.2	18.2	3.22 (1.68-6.15)	0. 001*
>70	35.2	21.4	3.07 (1.59-5.93)	0.001*
Marital Status				
Married	36.5	67.8	1.0 Reference	-------
Not Married	63.5	32.2	3.21 (1.67-6.16)	0.001*
Educational level				
Illiterate	37.7	30.9	1.0 Reference	-------
Basic school	16.1	32.8	0.49 (0.30-0.80)	0.005*
High school	13.2	11.4	1.23 (0.67-2.16)	0.476
University	32.9	24.9	0.82 (0.54-1.25)	0.364
Employment				
Employed	61	41.5	2.31 (1.39-3.81)	0.006*
Unemployed	39	58.5	1.0 Reference	-------
Socio economic score level				
Low level	43.9	38.7	1.0 Reference	-------
Middle level	12.4	47.3	0.29 (0.18-0.47)	0.001*
High level	41.9	13.9	5.33 (3.47-8.17)	0.001*
Body Mass Index				
Normal	31	56.1	1.0 Reference	-------
Overweight	36.5	11.4	9.41 (5.92-14.94)	0.001*
Obese	32.6	29.5	2.52 (1.68-3.80)	0.001*

* significant difference.

Table [3]: Comparison between hypertension and normal groups regarding their generic health-related quality of life

HRQOL Domains	Hypertension (N=310) Mean (SD)	Normal (N=790) Mean (SD)	T	P value
General Health	40.8 (10.3)	79.2 (11.9)	49.9	0.001*
Bodily Pain	41.3 (9.7)	79.6 (12.7)	47.9	0.001*
Physical Functioning	45.1 (16.2)	78.6 (12.3)	37.0	0.001*
Role Limitation Physical	40.7 (9.6)	81 (10.5)	58.4	0.001*
PCS	42.7 (13.2)	79.9 (9.7)	51.6	0.001*
Social Functioning	42.5 (12.4)	78.3 (13.9)	39.4	0.001*
Role Limitation Emotional	45.7 (8.6)	77.9 (12.2)	42.6	0.001*
Vitality	37.9 (9.8)	75.1 (13.9)	42.9	0.001*
Mental Health	44.8 (14.5)	77.5 (12.6)	36.9	0.001*
MCS	39.7 (13.1)	80.2 (10.7)	52.9	0.001*

Table [4]: Comparison between the experimental and control groups regarding their generic health-related quality of life after the intervention program

HRQOL Domains	Experimental Mean (SD)	Control Mean (SD)	T	P value
General Health	79.5 (11.5)	40.9 (10.1)	25.3	0.001*
Bodily Pain	79.8 (12.1)	40.5 (8.4)	26.5	0.001*
Physical Functioning	78.3 (12.5)	45.9 (14.7)	16.8	0.001*
Role Limitation Physical	81.2 (10.4)	39.8 (9.1)	29.9	0.001*
PCS	80.5 (9.5)	42.4 (13.3)	23.3	0.001*
Social functioning	79.4 (13.2)	42.5 (11.9)	20.8	0.001*
Role Limitation Emotional	77.3 (12.5)	46.1 (8.4)	20.6	0.001*
Vitality	75 (13.5)	37.7 (9.9)	22.3	0.001*
Mental health	77.1 (12.8)	44.6 (13.6)	17.4	0.001*
MCS	79.9 (10.3)	39.9 (12.8)	24.3	0.001*

* significant difference.
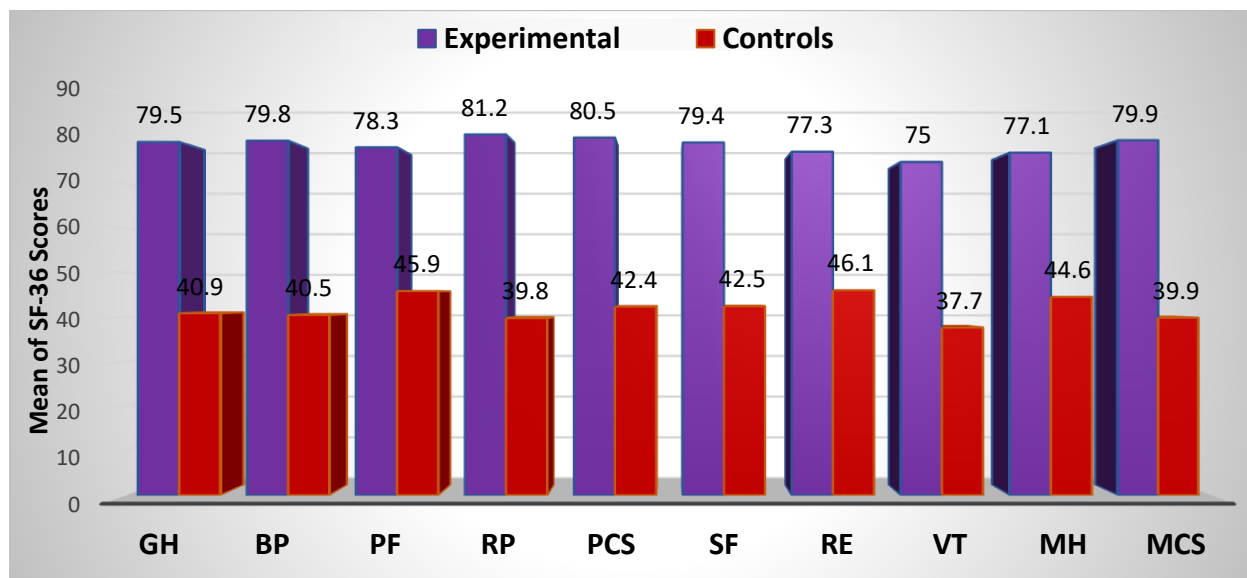
General Health (GH), Bodily Pain (BP), Physical Functioning (PF), Role Physical (RP), Physical Component Summary (PCS), Social Functioning (SF), Role Emotional (RE), Vitality (VT), Mental Health (MH) and Mental component summary (MCS).

Figure [1]: Comparison between the experimental and control groups regarding their health-related quality of life means scores after the intervention program.

DISCUSSION

In the present study we identified the prevalence rate of hypertension among adult inhabitants of Badaway village, Al-Mansoura District, Al-Dakahlia Governorate in addition. In addition, assessed the impact of health education program on HRQOL of hypertension patients?

Regarding hypertension prevalence, results of the present work was agreement with Babaee et al.[14] study conducted among rural population in Egypt reported that 27.9% of the studied sample were hypertensive. High prevalence of hyper-tension in this study is probably attributable to lifestyle changes in rural areas over recent years, industrialization, urbanization, increasing economic development, modernization, market globalization. This has induced adverse diet and lifestyle changes. Which, in effect, also led to higher risk factors for hypertension such as overweight or obese [15]. This study result corresponds also with a Korean study that showed that hypertension was more prevalent among women than among men [16].

In disagreement with our study Ibrahim and Damasceno[17] conducts study in Egypt and concluded that hypertension was more prominent in men than in women. Also, in contrast to our study the prevalence among Iranians was 25.9% for men and 20% for women[18]. Such disagreement may be due to the study's self-report questionnaire design and the fact that women are generally more likely to say they are unwell than men. In addition, results of the present work coincide with Yu et al.[19] cross-sectional study of 6660 people undergoing a health check in China from July to November 2012, logistic regression analyses found that advanced age and high BMI were significant risk factors for hypertension and had a positive association impact of the prevalence of hypertension in adults. This finding also agrees with the study by ElShazly and Hegazy[20] finding that age, sex, family size, socioeconomic score and occupation were the main determinants of hypertension. These results could be explained by the large over-nutrition and sedentary lifestyle in most populations associated with the occurrence of chronic diseases as hypertension[21]. A variety of factors closely related to the degree of obesity and overweight (e.g. high sympathetic tones; sodium retention; hormonal levels such as angiotensin, angiotensin II, aldosterone and leptin; and insulin resistance) may also affect blood pressure[22].

Regarding health-related quality of life among hypertensive patients compared to non-

hypertension individuals, in agreement with our study Mohamed *et al.*[23] studied 600 individuals in rural areas in Egypt and found that the mean HRQOL scores among the hypertension community were highly significantly lower than the non-hypertensive group (P<0.0005). Also, this finding agrees a study in 2002 by Al-Ghamdi *et al.*[24] at primary health care facilities in Al-Khobar, Saudi Arabia, for comparison the HRQOL of hypertensive patients with a control group, 404 subjects were interviewed (202 cases and 202 controls). Of age and sex, the cases and controls matched. HRQOL self-assessment patients were assessed using an Arabic version ofSF-36, a 36-item Short-Form Health Survey Questionnaire, the study concluded that the HRQOL of hypertensive patients was significantly impaired compared to the control group. For cases and controls, respectively, the mean scores for the physical component summary scale (PCS) were 39.3 and 50.8. The mean scores for the summary scale of the mental component (MCS) were 43.7 and 50.8 respectively for cases and controls. In addition, this study coincides with the survey by Poljičanin *et al.*[25] that was part of the Croatian Adult Health Survey (CAHS), a cross-sectional field survey that included 9,070 respondents aged 18 and over and conducted in 2003 by qualified health care professionals. The data gathered in this study provided a comprehensive health assessment of Croatian residents, including their HRQOL, using an SF-36 questionnaire and found that hypertension had negative effects on HRQOL and that all dimensions of HRQOL were lower in people with hypertension compared to healthy people. These findings might be explained by, hypertension is closely related to psychological and emotional problems, particularly in extreme stresses in life. Furthermore, the impact of hypertension on quality of life and the suggestion that people with hypertension tend to have a better mechanism to cope with and adapt to this disease[26].

Regarding effect of an educational health program on health-related quality of life among hypertension patients: results of the present work showed agreement with the experimental study carried out by Miao *et al.* [27] in rural China, enrolled 1426 patients (n = 1006 intervention group and n = 420 control group) showed that the intervention in health education resulted in a significant improvement in the overall score of HRQOL SF-36 among intervention group. This result also coincides with a single-blind, randomized controlled clinical trial in Egypt by Amany *et al.* [28] in which 112 non-complicated, apparently healthy critical hypertensive patients with no comorbidities between 45 and 65 years of age were randomly assigned to two groups (intervention and control 1:1) at the University of Zagazig Internal Medicine. The research aimed to examine the impact of the patient-centered approach on self-reported health-related quality of life (HRQOL) in patients with critical hypertension attending outpatient clinic in internal medicine. This study found that patients with essential hypertension indicated worsening of HRQOL in both groups, but at the start of the study there was no statistically significant difference in HRQOL between the two groups. At the end of the study, there was a statistically significant difference between the two sample groups in terms of blood pressure control and self-reported health-related quality of life where patients in the intervention group reported statistically significant improvements in both variables.

Limiting steps of the present work includes that, the results of this study could not be generalized to rural Egypt as the data was collected from only one village. The social relationship of the researcher with the studied participants in the village facilitated the work. Also, the nature of the cross-sectional study has its limitations on causal inference between category income, occupation and the prevalence of hypertension. So, further cohort studies with follow-up data are necessary to strengthen the evidence. For example, individuals might be hypertensive before they were employed or started earning higher wages, we are not sure which came first. Finally, the data from this study is also highly dependent on the participant's answers. Memory, truthfulness, and their perception of their level of undertaking in certain questions (e.g., Income, salt usage on food, diet, minutes/hours of physical activity), can cause large errors in the results

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