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Hypertension, depression, and health-related quality of life among hospitalized patients in Afghanistan

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In recent decades, hypertension has become the foremost risk factor for disability-adjusted life years (DALYs). The present study investigated the relationship between quality of life, depression, and hypertension among hospitalized patients in Afghanistan. A cross-sectional survey was administered from September 3, 2022, to February 2, 2023, in the Herat and Mazar-e-Sharif provinces of Afghanistan (N = 2059). The prevalence of depression symptoms was 65.8%, and hypertension was 20.9%. Multiple regression analysis indicated that moderate physical functioning, poor role-physical, higher bodily pain, poor general health, poor social functioning, lower role-emotional, and poor mental health significantly predicted depression. Multiple regression analysis indicated that moderate quality of life, poor physical functioning, higher bodily pain, lower energy/fatigue, and depression significantly predicted hypertension. The findings of the present study offer valuable insights for healthcare providers, policymakers, and researchers in developing targeted interventions and policies to enhance the well-being of individuals facing the challenges of depression and hypertension. The prevalence of hypertension and depression was high among patients in the Herat and Mazar-e-Sharif provinces of Afghanistan. Patients with hypertension had poor mental and physical quality of life. Hospitals should therefore implement regular screening for depression and offer psychological counseling for vulnerable patients with hypertension.

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Introduction

Hypertension is a major risk factor for cardiovascular diseases (CVDs), chronic kidney disease, and dementia and has emerged as a leading modifiable cause of premature deaths worldwide [1-4]. In recent decades, hypertension has become the foremost risk factor for disability-adjusted life years (DALYs) (whereas in 1990, hypertension ranked seventh in risk factor for DALYs) [5]. Globally, 1.28 billion adults between the ages of 30 and 79 years are affected by hypertension [6]. The epidemiology of hypertension exhibits stark differences across the world, with rising prevalence and undertreatment observed among individuals from lower- and middle-income countries (LMICs) and a declining prevalence among individuals from high-income countries (HICs) [7].

The main mechanism through which hypertension causes harm is by increasing strain on the heart and blood vessels, leading to a higher workload and reduced efficiency in their functioning. Over time, hypertension can lead to stroke, vision loss, heart failure, heart attack, kidney disease and sexual dysfunction [8].

Afghanistan (where the present study was carried out) faces a significant hypertension burden, with the 2018 STEPS survey indicating that 29.5% of the adult population suffered from hypertension, of which only one-fifth had their condition under control [9]. A more recent 2022 study in Afghanistan echoed these findings, reporting a similar proportion of the population with uncontrolled hypertension [10].

The impact of hypertension extends beyond its physical consequences, influencing psychosocial function and various activities of daily living. Even asymptomatic individuals diagnosed with hypertension undergo what is termed the 'labeling effect', adopting the sick role and prompting interest in assessing their quality of life (QOL) [11-13]. The measurement of QOL has become an emerging science in the last few decades, where the WHO defines quality of life 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"* [14]. There is now recognition that meaningful measures of QOL should be used to monitor the health of the general population, estimate the burden of different conditions, and evaluate treatment outcomes. It is important to recognize how patients feel, especially in the context of managing chronic conditions such as hypertension, as it has become equally significant alongside symptom response and survival rates [15].

To comprehensively assess quality of life, the 36-item Short Form Health Survey (SF-36) has emerged as a versatile and widely utilized tool. The SF-36 is grouped into two main components, each containing eight scales. The Physical Component Summary (PCS) evaluates aspects such as physical functioning, role-physical, bodily pain, general health, and vitality, while the Mental Component Summary (MCS) focuses on mental health, role-emotional, social functioning, and vitality. Additionally, the SF-12 is a shorter alternative to the SF-36, comprising a subset of 12 items from the original scale [16]. The SF-12 has been validated as a suitable substitute for the SF-36 in clinical practice or research settings when studying hypertensive individuals and their treatment [17].

Numerous studies have demonstrated that individuals with hypertension experience a lower health-related quality of life (HRQL) than normotensive individuals [18-21]. Particularly among the elderly population, hypertension has been associated with reduced HRQL, primarily affecting physical functioning [19]. This adverse association can be influenced by factors such as complications arising from hypertension, lifestyle adjustments, knowledge of the disease, and the adverse effects of pharmacological therapy [21-22]. Moreover, it is essential to recognize markers of diminished HRQL to enhance clinical care and identify areas of intervention for disease prevention and treatment [23]. Furthermore, evaluating health status using HRQL has proven to be a more potent predictor of mortality and morbidity compared to other objective health measures (e.g., asthma, cancer, chronic obstructive pulmonary disease) [24].

Depression represents a significant global concern, with projections indicating that the proportion will be approximately one in three by 2025 and will become the leading cause of disability worldwide by 2030 [25-26]. Patients with depression and/or anxiety are particularly vulnerable to developing hypertension. A meta-analysis conducted in 2015 reported a prevalence of depression among hypertensive individuals ranging from 21.3% to 29.8%, significantly higher than the estimated 5% prevalence in the general adult population [25, 27]. Those with comorbid hypertension and depression face higher risks of cardiovascular disease-related mortality [28]. This combination of depression and hypertension significantly reduces the quality of life and increases the risk of myocardial infarction and stroke [29]. Existing studies suggest that comorbid depression may significantly impact physical functioning, quality of life, and healthcare utilization among patients with hypertension [30-31].

To date, no previous study has examined the hypertension, depression, and QoL of patients in Afghanistan while under the rule of the Taliban. The present study is also the first to investigate hypertension, depression, and QoL among patients simultaneously in Afghanistan. More specifically, the study investigated the following hypotheses (H_s): (i) a lower quality of life would be significantly associated with an increased likelihood of depression (H_1), and (ii) a lower quality of life would be significantly associated with an increased likelihood of hypertension (H_2). Understanding these interactions is essential in providing holistic care and improving patient outcomes.

Methods

Study design, participants and procedure

A cross-sectional study was carried out from September 3, 2022, to February 2, 2023, in the Herat and Mazar-e-Sharif provinces of Afghanistan. The study population comprised patients who were admitted to hospitals during this period. These patients underwent comprehensive interviews, during which the data were collected using a convenience cluster sampling technique. More specifically, the study involved the purposeful selection of public hospitals located in the two aforementioned provinces. Patients who were hospitalized within these selected medical institutions and demonstrated a willingness to participate in the study were included.

The evaluation of participants' depression levels and quality of life was assessed using standardized and validated psychometric tools, which were incorporated into the study design. A total of 4000 hospitalized patients within the public hospitals of Herat and Mazar-e-Sharif were approached to participate in the present study. Of these, 2059 patients agreed to participate in the study (response rate 51.48%). Data collectors were trained on how to approach patients to collect data from each patient. Every patient hospitalized in the aforementioned hospitals during the study period was asked to participate in the study. The prerequisite conditions for participation in the study were the provision of informed consent and hospitalization within the specified public hospitals.

Measures

The questionnaire used in the present study comprised three sections: socioeconomic information, screening for depression, and quality of life assessment. Participants also had their blood pressure taken. Socioeconomic information included questions on age, gender, height and weight (to calculate body mass index [BMI]), marital status (single/married/widowed/divorced), province, residency (urban/rural), education level, occupation (employed/unemployed), monthly family income, sports engagement (yes/no), and cigarette smoking (yes/no).

Depressive symptoms were assessed using the 19-item Dari version of the Center for Epidemiological Studies–Depression Scale [32]. The scale comprises three primary clusters: negative items (for instance, "*I felt everything I did was an effort*"), positive items (such as "*I enjoyed life*"), and items related to interpersonal relationships (e.g., "*I felt people dislike me*"). Each of these items is evaluated on a four-point scale ranging from 0 (*Rarely or none of the time/less than one day during the past week*) to 3 (*Most*

of all of the time/5-7 days during the past week). The resulting scores range from 0 to 60. The established threshold values for interpretation were as follows: scores ranging from 0 to 15 were indicative of subclinical depression, while a score of 16 or higher indicated the presence of depression. In the present study, the internal consistency, as reflected by Cronbach's alpha, was 0.918.

Quality of life was assessed using the 12-item Short-Form Survey (SF-12v2). Although the primary focus of the SF-12 is to gauge the influence of health conditions on an individual's daily life, pertinent to the SF-12v2 Manual and corroborated by prior research, the instrument has been repurposed to assess quality of life [33]. The instrument comprises two overarching dimensions: the physical component score (PCS) and the mental component score (MCS). In addition, there are eight subsidiary subcomponents that comprise physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), energy/fatigue (i.e., vitality [VT]), social functioning (SF), role-emotional (RE), and mental health (MH). Items (e.g., "During the past 4 weeks, how much did pain interfere with your normal work [including both work outside the home and housework]?") are rated on a scale from 1 (Not at all) to 5 (Extremely). Raw scores were converted into a transformed score range of 0-100. For each subscale, a total score of less than 46 indicates low QoL; 46 to 65 indicates moderate QoL; and higher than 65 indicates high QoL [34]. In the present study, the internal consistency as reflected by Cronbach's alpha was 0.828.

Blood pressure measurements were conducted twice for each participant. The initial measurement took place before the interview, and a second measurement took place after the interview. The mean of the two blood pressure checks was used as the measure for blood pressure in the present study. Participants exhibiting a systolic blood pressure equal to or exceeding 140 mmHg, a diastolic blood pressure equal to or exceeding 90 mmHg, or meeting both criteria were classified as individuals manifesting hypertension [35].

Statistical analysis

Data input was executed utilizing *Microsoft Excel 2016*, while the subsequent analysis was undertaken utilizing *IBM SPSS version 26.0* designed for the *Windows* operating system. The presentation of descriptive statistics included mean values, standard deviations, frequencies, and percentages. The relationships among categorical variables were examined using chi-square tests. Multiple logistic regression analysis was used to see which factors were the most important in predicting depression and hypertension. All of the variables with a *p*-value less than 0.05 were considered significant.

Results

A total of 2059 hospitalized patients participated in the present study, with an age range of 15 to 110 years (mean age = 38.85 years [SD±17.92]). More than half of the participants were female (54.2%), and more than half had a normal BMI (56.0%). Almost three-quarters of the participants were married (74.5%). Over two-thirds of the participants were hospitalized patients from Herat Province (70.5%). More than half of the participants were living in rural areas (58.4%). More than half of the participants reported that their monthly income was more than the equivalent of \$50 (US) (59.6%). Less than one-tenth of the participants were cigarette smokers (6.4%) [Table 1].

Table 1. Characteristics distribution of the hospitalized patients (N=2059)

Characteristic	Categories	Number (N)	Percentage (%)
Age group	15–39-years	1126	54.7
	40–110-years	933	45.3
Gender	Male	943	45.8
	Female	1116	54.2
BMI	Underweight	335	16.3
	Normal weight	1153	56.0
	Overweight	398	19.3
	Obese	173	8.4
Marital status	Single	375	18.2
	Married	1533	74.5
	Widow/divorced	151	7.3
Province	Herat	1451	70.5
	Mazar-e-Sharif	608	29.5
Residency	Urban	856	41.6
	Rural	1203	58.4
Education	Illiterate	1174	57.0
	Primary school	394	19.0
	Secondary school	252	12.2
	High school	167	8.1
	University	72	3.5
Occupation	Employed	282	13.7
	Unemployed	1777	86.3
Monthly family income	Less than \$50	831	40.4
	More than \$50	1228	59.6
Engage in sports	Yes	297	14.4
	No	1762	85.6
Cigarette smoker	No	1928	93.6
	Yes	131	6.4
Having hypertension	No	1629	79.1
	Yes	430	20.9
Total		2059	100.0

Almost two-thirds of the participants had a poor quality of life on the physical component subscale (63.8%). Less than half of the participants had a poor quality of life on the mental component subscale (44.6%). Almost one-third of the participants had a poor quality of life on the physical functioning component subscale (30.7%) [Table 2].

Table 2. Domains of quality of life of hospitalized patients (N=2059)

Variable	Mean + SD	SF-12 Components		
		Low	Moderate	High
Physical Functioning (PF)	1.91 ± 0.72	633 (30.7)	984 (47.8)	442 (21.5)

Role-Physical (RP)	1.72 ± 0.93	1261 (61.2)	110 (5.3)	688 (33.4)
Bodily Pain (BP)	1.97 ± 0.72	560 (27.2)	1000 (48.6)	499 (24.2)
General Health (GH)	1.63 ± 0.69	1004 (48.8)	811 (39.4)	244 (11.9)
Energy/Fatigue (VT)	1.75 ± 0.87	1098 (53.3)	377 (18.3)	584 (28.4)
Social Functioning (SF)	1.81 ± 0.80	897 (43.6)	661 (32.1)	501 (24.3)
Role-Emotional (RE)	1.81 ± 0.95	1162 (56.4)	131 (6.4)	766 (37.2)
Mental Health (MH)	1.95 ± 0.82	734 (35.6)	688 (33.4)	637 (30.9)
Physical Component Score (PCS)	1.56 ± 0.80	1313 (63.8)	346 (16.8)	400 (19.4)
Mental Component Score (MCS)	1.83 ± 0.83	918 (44.6)	576 (28.0)	565 (27.4)

Two-thirds of the participants had symptoms of depression (65.8%). Among those with symptoms of depression, (i) three-quarters were female (77.2%), and (ii) 85.4% were widowed/divorced. There was a significant relationship between having symptoms of depression and (i) age (older participants were more depressed), (ii) gender (female participants were more depressed), (iii) BMI (participants who were obese were more depressed), (iv) marital status (participants who were widowed were more depressed), (v) province (participants in Mazar-e-Sharif province were more depressed), (vi) monthly family income (participants with a family monthly income of less than \$50 were more depressed), and (vii) cigarette smoking (participants who smoked cigarettes were more depressed) symptoms [Table 3].

Table 3. Association of depression with participants' sociodemographic characteristics (N=2059)

Characteristic	Categories	Mental health		p-value
		Normal N (%)	Depressed N (%)	
Age group	15–39-years	407 (36.1)	719 (63.9)	.045
	40–110-years	298 (31.9)	635 (68.1)	
Gender	Male	451 (47.8)	492 (52.2)	<.001
	Female	254 (22.8)	862 (77.2)	
BMI	Underweight	95 (28.4)	240 (71.6)	<.001
	Normal weight	407 (35.3)	746 (64.7)	
	Overweight	163 (41.0)	235 (59.0)	
	Obesity	40 (23.1)	133 (76.9)	
Marital status	Single	161 (42.9)	214 (57.1)	<.001
	Married	522 (34.1)	1011 (65.9)	
	Widow/divorced	22 (14.6)	129 (85.4)	
Province	Herat	670 (46.2)	781 (53.8)	<.001
	Mazar-e-Sharif	35 (5.8)	573 (94.2)	
Residency	Urban	286 (33.4)	570 (66.6)	.504
	Rural	419 (34.8)	784 (65.2)	
Education	Illiterate	399 (34.0)	775 (66.0)	.386
	Primary school	126 (32.0)	268 (68.0)	
	Secondary school	86 (34.1)	166 (65.9)	
	High school	68 (40.7)	99 (59.3)	
	University	26 (36.1)	46 (63.9)	
Occupation	Employed	92 (32.6)	190 (67.4)	.538

	Unemployed	613 (34.5)	1164 (65.5)	
Monthly family income	Less than \$50	256 (30.8)	575 (69.2)	.007
	More than \$50	449 (36.6)	779 (63.4)	
Engage in sports	Yes	93 (31.3)	204 (68.7)	.251
	No	612 (34.7)	1150 (65.3)	
Cigarette smoker	No	683 (35.4)	1245 (64.6)	<.001
	Yes	22 (16.8)	109 (83.2)	
Have hypertension	No	552 (33.9)	1077 (66.1)	.510
	Yes	153 (35.6)	277 (64.4)	
Total		705 (34.2)	1354 (65.8)	

In relation to having a low quality of life on the physical component, (i) almost two-thirds were female (64.5%), (ii) more than two-thirds were from Mazar-e-Sharif (68.6%), (iii) more than two-thirds were illiterate (68.8%), and (iv) almost two-thirds were unemployed (64.8%). There was a significant relationship between low physical quality of life and (i) age (older participants had poorer physical quality of life), (ii) gender (female participants had poorer physical quality of life), (iii) BMI (participants who were obese had poorer quality of life), (iv) marital status (participants who were divorced had poorer physical quality of life), (v) province (participants living in Mazar-e-Sharif had poorer physical quality of life), (vi) education (participants who were illiterate had poorer physical quality of life), (vii) occupation (participants who were unemployed had poorer physical quality of life), (viii) monthly family income (participants with monthly family income of lower than \$50 had poorer physical quality of life), and (ix) presence of hypertension (participants with hypertension had poorer physical quality of life) [Table 4].

Table 4. Association of the physical component of quality of life with participants' sociodemographic characteristics (N=2059)

Characteristic	Categories	Physical Component			p-value
		Low N (%)	Moderate N (%)	High N (%)	
Age group	15–39-years	640 (56.8)	217 (19.3)	269 (23.9)	.000
	40–110-years	673 (72.1)	129 (13.8)	131 (14.0)	
Gender	Male	593 (62.9)	144 (15.3)	206 (21.8)	.019
	Female	720 (64.5)	202 (18.1)	194 (17.4)	
BMI	Underweight	210 (62.7)	54 (16.1)	71 (21.2)	.010
	Normal weight	731 (63.4)	188 (16.3)	234 (20.3)	
	Overweight	259 (65.1)	61 (15.3)	78 (19.6)	
	Obesity	113 (65.3)	43 (24.9)	17 (9.8)	
Marital status	Single	185 (49.3)	75 (20.0)	115 (30.7)	<.001
	Married	1008 (65.8)	256 (16.7)	269 (17.5)	
	Widow/divorced	120 (79.5)	15 (9.9)	16 (10.6)	
Province	Herat	896 (61.8)	224 (15.4)	331 (22.8)	<.001
	Mazar-e-Sharif	417 (68.6)	122 (20.1)	69 (11.3)	
Residency	Urban	533 (62.3)	148 (17.3)	175 (20.4)	.471
	Rural	780 (64.8)	198 (16.5)	225 (18.7)	

Education	Illiterate	808 (68.8)	164 (14.0)	202 (17.2)	<.001
	Primary school	250 (63.5)	73 (18.5)	71 (18.0)	
	Secondary school	140 (55.6)	59 (23.4)	53 (21.0)	
	High school	76 (45.5)	37 (22.2)	54 (32.3)	
	University	39 (54.2)	13 (18.1)	20 (27.8)	
Occupation	Employed	162 (57.4)	52 (18.4)	68 (24.1)	.044
	Unemployed	1151 (64.8)	294 (16.5)	332 (18.7)	
Monthly family income	Less than \$50	569 (68.5)	128 (15.4)	134 (16.1)	.001
	More than \$50	744 (60.6)	218 (17.8)	266 (21.7)	
Engage in sports	Yes	178 (59.9)	64 (21.5)	55 (18.5)	.061
	No	1135 (64.4)	282 (16.0)	345 (19.6)	
Cigarette smoker	No	1227 (63.6)	333 (17.3)	368 (19.1)	.054
	Yes	86 (65.6)	13 (9.9)	32 (24.4)	
Have hypertension	No	1026 (63.0)	267 (16.4)	336 (20.6)	.026
	Yes	287 (66.7)	79 (18.4)	64 (14.9)	
Total		1313 (63.8)	346 (16.8)	400 (19.4)	

In relation to having a low quality of life on the mental component, (i) more than half were female (51.5%), (ii) more than half were from Mazar-e-Sharif (59.2%), and (iii) almost half were unemployed (45.1%). There was a significant relationship between low mental quality of life and (i) age (older participants had poorer mental quality of life), (ii) gender (female participants had poorer mental quality of life), (iii) BMI (participants who were underweight had poorer mental quality of life), (iv) marital status (participants who were widowed had poorer mental quality of life), (v) province (participants living in Mazar-e-Sharif had poorer mental quality of life), (vi) education (participants who were illiterate had poorer mental quality of life), (vii) monthly family income (participants with a monthly family income of less than \$50 had poorer mental quality of life), (viii) cigarette smoking (participants who smoked cigarettes had poorer mental quality of life), and (ix) hypertension (participants with hypertension had poorer mental quality of life) [Table 5].

Table 5. Association of the mental component of quality of life with participants' sociodemographic characteristics (N=2059)

Characteristic	Categories	Mental Component			p-value
		Low N (%)	Moderate N (%)	High N (%)	
Age group	15–39-years	461 (40.9)	319 (28.3)	346 (30.7)	<.001
	40–110-years	457 (49.0)	257 (27.5)	219 (23.5)	
Gender	Male	343 (36.4)	270 (28.6)	330 (35.0)	<.001
	Female	575 (51.5)	306 (27.4)	235 (21.1)	
BMI	Underweight	159 (47.5)	95 (28.4)	81 (24.2)	.015
	Normal weight	503 (43.6)	299 (25.9)	351 (30.4)	
	Overweight	181 (45.5)	121 (30.4)	96 (24.1)	
	Obesity	75 (43.4)	61 (35.3)	37 (21.4)	
Marital status	Single	134 (35.7)	109 (29.1)	132 (35.2)	<.001

	Married	683 (44.6)	436 (28.4)	414 (27.0)	
	Widow/divorced	101 (66.9)	31 (20.5)	19 (12.6)	
Province	Herat	558 (38.5)	453 (31.2)	440 (30.3)	<.001
	Mazar-e-Sharif	360 (59.2)	123 (20.2)	125 (20.6)	
Residency	Urban	381 (44.5)	236 (27.6)	239 (27.9)	.900
	Rural	537 (44.6)	340 (28.3)	326 (27.1)	
Education	Illiterate	557 (47.4)	340 (29.0)	277 (23.6)	<.001
	Primary school	179 (45.4)	97 (24.6)	118 (29.9)	
	Secondary school	100 (39.7)	72 (28.6)	80 (31.7)	
	High school	51 (30.5)	45 (26.9)	71 (42.5)	
	University	31 (43.1)	22 (30.6)	19 (26.4)	
Occupation	Employed	117 (41.5)	75 (26.6)	90 (31.9)	.191
	Unemployed	801 (45.1)	501 (28.2)	475 (26.7)	
Monthly family income	Less than \$50	400 (48.1)	227 (27.3)	204 (24.5)	.015
	More than \$50	518 (42.2)	349 (28.4)	361 (29.4)	
Engage in sports	Yes	122 (41.1)	86 (29.0)	89 (30.0)	.390
	No	796 (45.2)	490 (27.8)	476 (27.0)	
Cigarette smoker	No	846 (43.9)	543 (28.2)	539 (28.0)	.035
	Yes	72 (55.0)	33 (25.2)	26 (19.8)	
Have hypertension	No	719 (44.1)	441 (27.1)	469 (28.8)	.020
	Yes	199 (46.3)	135 (31.4)	96 (22.3)	
Total		918 (44.6)	576 (28.0)	565 (27.4)	

Multiple logistic regression was run to determine which variables predicted depression: overall quality of life, domains of quality of life (physical functioning, role-physical, bodily pain, general health, energy/fatigue, social functioning, role-emotional, mental health) and hypertension. Analysis indicated that the following variables significantly predicted depression: moderate physical functioning (OR=1.207, $p=.001$), poor role-physical (OR=0.474, $p<.001$), higher bodily pain (OR=0.846, $p=.007$), poor general health (OR=1.971, $p<.001$), poor social functioning (OR=1.435, $p<.001$), lower role-emotional (OR=2.493, $p<.001$), and poor mental health (OR=1.544, $p<.001$) [Table 6].

Table 6. Multiple logistic regression analysis of depression on hypertension and components of quality of life of hospitalized participants (N=2059)

Variable	OR [95% CI]	p-value
Overall quality of life		
Low	1.166 [0.562, 2.422]	.680
Moderate	1.267 [0.796, 2.015]	.318
High	Reference	
Physical functioning	1.207 [1.085, 1.343]	.001
Role-physical	0.474 [0.369, 0.607]	<.001
Bodily pain	0.846 [0.749, 0.954]	.007
General health	1.971 [1.669, 2.328]	<.001
Energy/fatigue	1.019 [0.882, 1.178]	.800
Social functioning	1.435 [1.275, 1.615]	<.001

Role-emotional	2.493 [1.964, 3.165]	<.001
Mental health	1.544 [1.406, 1.695]	<.001
Hypertension (ref: Yes)	0.806 [0.608, 1.069]	.135

Multiple logistic regression was run to see which variables predicted hypertension comprising the following: overall quality of life, domains of quality of life (physical functioning, role-physical, bodily pain, general health, energy/fatigue, social functioning, role-emotional, mental health) and depression. Analysis indicated that the following variables significantly predicted hypertension: moderate quality of life (OR=0.563, $p=.009$), poor physical functioning (OR=1.005, $p=.023$), higher bodily pain (OR=1.005, $p=.044$), lower energy/fatigue (OR=1.008, $p=.022$), and depression (OR=1.014, $p=.014$) [Table 7].

Table 7. Multiple logistic regression analysis of hypertension on depression and quality of life of hospitalized participants (N=2059)

Variable	OR [95% CI]	p-value
Overall quality of life		
Low	0.536 [0.277, 1.039]	0.065
Moderate	0.563 [0.367, 0.865]	0.009
High	Reference	
Physical functioning	1.005 [1.001, 1.009]	0.023
Role-physical	0.996 [0.992, 1.001]	0.087
Bodily pain	1.005 [1.000, 1.009]	0.044
General health	0.998 [0.992, 1.004]	0.586
Energy/fatigue	1.008 [1.001, 1.015]	0.022
Social functioning	0.999 [0.993, 1.004]	0.668
Role-emotional	0.999 [0.995, 1.004]	0.758
Mental health	0.999 [0.990, 1.008]	0.824
Depression	1.014 [1.003, 1.025]	0.014

Discussion

The present study investigated whether a lower quality of life was significantly associated with an increased likelihood of both depression (H_1) and hypertension (H_2) among hospitalized Afghan patients. A total of 2059 individuals between the ages of 15 and 110 years participated in the study, and there was a negative association between the presence of hypertension and HRQL among the participants. This concurs with the findings of previous studies that have indicated that hypertension has a significant association with a reduction in a patient's quality of life [16-19, 36-38].

In addition, the present study found that hypertensive patients had lower scores in both physical and mental components of quality of life. Similarly, a systematic review and meta-analysis [20] also found that hypertensive patients scored lower in both physical and mental components of quality of life. More specifically, this systematic review and meta-analysis indicated that quality of life was significantly lower in all eight domains of the SF-36 (i.e., physical functioning, role-physical and role-emotional, bodily pain, general health, vitality, and mental health) [20]. In the present study, hypertension was significantly

associated with lower scores on physical functioning, bodily pain, and energy/fatigue (vitality) quality of life domains.

In a 2019 Indonesian study, age, marital status, and duration of hypertension were found to be associated with the physical quality of life domain. Moreover, poor mental quality of life domain was significantly associated with being female, being single, having a longer duration of disease, having hypertension complications, and higher number of medicinal drugs used [39]. Many other studies have found significant associations between HRQoL among hypertensive patients and various factors. These factors include the duration of hypertension (having it longer), age (being older), lower sociodemographic status, presence of hypertension-related symptoms, marital status (being divorced), uncontrolled blood pressure, poor treatment adherence, presence of comorbidities (e.g., kidney disease), complications (e.g., hypertensive retinopathy), lack of social support, and gender (being female) [40-44].

In the present study, the gender difference in HRQL may be because females are more attentive to their symptoms, having symptoms due to biological differences (e.g., menstruation, menopause), psychological factors (e.g., societal pressures related to body image and self-esteem), and cultural factors (e.g., specific expectations and practices related to gender roles and health behaviors) [45-48]. Differences in lifestyle choices and having higher education status (which often leads to higher-status employment, higher income) and healthier lifestyles may also contribute to the elevated HRQL observed among those in higher social groups and with higher incomes [49]. Some studies have discussed the 'labeling' effect among individuals with hypertension, indicating that being aware of the diagnosis can influence absenteeism, overall well-being, and how symptoms are reported [50]. Additionally, hypertensive patients often assume the 'sick role', which may further contribute to a decline in their subjective well-being [51].

The prevalence of depression among patients in the present study was found to be high, and almost four-fifths of the female participants were depressed. This finding is consistent with the findings of other studies in Afghanistan, which reported almost the same prevalence of depression [34, 52]. The present study did not find a significant positive association between depression and hypertension, which was in line with the majority of other studies showing slight or no significant association between hypertension and depression [53-55]. In the present study, depression was significantly associated with being older, being female, being obese, being widowed/divorced, residing in Mazar-e-Sharif Province, having a monthly income less than \$50 (US), and being a cigarette smoker. These findings were similar to the findings of other studies [25, 28-30].

Depression among hypertensive patients has been associated with lower quality of life. The findings of the present study indicated that a lower quality of life was significantly associated with an increased likelihood of depression (supporting H₁). Chronic illness, disability, financial stress, and inadequate social support are all components of a diminished quality of life that have been consistently linked to higher rates of depression in research literature [56]. Therefore, it is reasonable to posit that individuals with a lower quality of life are indeed more likely to experience depression, lending support to hypothesis H₁. Depression has been found to have adverse health outcomes, including diminished quality of life, increased medical utilization, lower treatment compliance, elevated mortality rates, and potential

impairment in occupational and social functioning among hospitalized patients [29-31, 57-58]. However, studies have shown that depression frequently occurs among individuals with uncontrolled hypertension, potentially affecting blood pressure management [59]. Given that depression and chronic medical illnesses interact to amplify the effects of the medical illness, hypertensive individuals with depression represent a particularly vulnerable group that is susceptible to the compounded effects of their medical conditions [60].

The present study found that hypertensive patients were found to have poor general quality of life, poor physical functioning, higher bodily pain, lower energy/fatigue, more prevalent to depression. The findings of the present study also indicated that poorer quality of life was associated with increased hypertension (supporting H₂). These findings suggest that relationship between quality of life and hypertension is likely a complex interplay where diminished quality of life significantly influences the onset and progression of hypertension [19]. Factors such as chronic stress, resulting from anxiety, depression, or social isolation, activate the body's sympathetic nervous system, initiating a 'fight or flight' response that persistently elevates blood pressure levels, thereby facilitating the development of hypertension [60-62]. Studies have shown that quality of life among hypertensive patients is lower than the normal people [11-13]. Hypertensive patients represent a particularly vulnerable group that is susceptible to the compounded effects of their mental health and quality of life [12, 63].

Strengths

The present study has a number of notable strengths, including the utilization of standardized and validated assessment instruments for estimating the prevalence of depression and evaluating the quality of life and the measurement of hypertension using an objective measure. The study also had a substantial sample size.

Limitations

Several limitations should be considered when interpreting the findings. Firstly, the data collected were cross-sectional which meant that causal relationships between the study variables could not be determined. Therefore, the findings must be treated with caution, acknowledging that while significant associations were identified, the relationships could be bi-directional (e.g., hypertension may lead to a poorer quality of life, and vice versa). Longitudinal and experimental studies are required to determine the directionality of these relationships. Secondly, the sample exclusively encompassed hospitalized patients from hospitals located within the urban areas of Herat and Mazar-e-Sharif provinces in Afghanistan, thereby potentially limiting the generalizability of the findings to hospitals in other geographical regions within Afghanistan and to other types of individuals. Thirdly, all data, except for blood pressure measurements, relied on self-report, introducing inherent methodological biases to the collected data. Finally, a significant proportion of the data originated from patients in Herat Province (constituting 70.5% of the dataset), with only 29.5% derived from Mazar-e-Sharif Province. This disparity in data distribution may have introduced some degree of bias into the study's outcomes.

Conclusion and recommendations

The findings of the present study offer valuable insights for healthcare providers, policymakers, and researchers in developing targeted interventions and policies to enhance the well-being of individuals facing the challenges of hypertension and depression. The prevalence of hypertension and depression was high among patients in the Herat and Mazar-e-Sharif provinces of Afghanistan. Patients with hypertension had poor mental and physical quality of life. Hospitals should therefore implement regular screening for depression and offer psychological counseling for vulnerable patients with hypertension.

Lifestyle modifications, stress management, and treatment adherence related to hypertension acknowledge the multi-faceted impact of socioeconomic factors, education, physical environment, employment, and social support networks on physical and psychological health and well-being. These determinants provide a contextual backdrop against which individual health behaviors and outcomes, including hypertension, can be better understood. For instance, individuals in lower socioeconomic positions may experience higher levels of stress due to financial insecurity, limited access to healthcare resources, and unhealthy living conditions, all of which can exacerbate hypertension and diminish overall well-being. Conversely, strong social support networks and secure employment can buffer against stress and promote healthier lifestyle choices, illustrating how positive social determinants could mitigate hypertension risk.

Future studies should use longitudinal and interventional designs to explore how lifestyle changes, stress reduction, and better treatment adherence affect hypertension and quality of life, and vice versa. Determining the extent to which the relationship between quality of life and hypertension is bi-directional could lead to the development of more holistic approaches in hypertension management, potentially leading to more effective public health strategies that improve both health outcomes and quality of life.

Declarations

Ethical approval and consent to participate

The present study was approved by the Ethical Committee of the Afghanistan Center for Epidemiological Studies (ref: #22.1.015). In the initial engagement with participants, a comprehensive account of the study's objectives was provided. Written informed consent was provided by all participants involved in the study apart from those who were illiterate, who provided verbal informed consent. Participants were told of their prerogative to withdraw their participation at any time without repercussion. All methods adhered to pertinent ethical principles of the Helsinki Declaration.

Consent for publication

Not applicable.

Availability of data and materials

The datasets during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare no conflict of interest.

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