Prevalence of Depression and its Associated Factors Among Hypertensive Patients: A Cross Sectional Study

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ABSTRACT

Introduction: Mental health and physical health are association with each other's: poor mental health is a risk factor for chronic physical condition and it significantly impact on people's quality of life. The social determinants of health impact on both chronic physical condition and mental health. The purpose of this study was to determine the prevalence sub-clinical depression and factors associated with depression among the hypertensive out patients' department of hospitals in Pokhara.

Methods: A hospital based cross-sectional study design was conducted among 215 hypertensive patient visiting OPD ward of selected hospitals of Pokhara Metropolitan City. Depression levels were assessed using the Beck Depression Inventory-Ia (BDI) scale. Demographics and risk factors were assessed. Systematic random sampling was conducted for selecting hospitals and proportionate random sampling technique was used to make the sample representative of hospitals.

Results: Out of the total 215 hypertensive patients and around fifty-nine percentage were males and the mean age of respondents is 52 ± 12.04 years. Around one-third of the hypertensive patients had depression. The mean BDI-Ia score for depression status having respondent was 16.88 ± 16.45.

Conclusion: This study provides the evidence of depression is associate with hypertensive patient's socio-demographic factors such as sex, age, marital status, employment and income and behavioral factors. Hypertensive patients should be encouraged to increase their physical activities and family support.

Keywords: *Depression, hypertension, patients*

INTRODUCTION

Non communicable diseases are coined as chronic disease which are slow progressive with prolong effect and long lasting which are the result of combination of genetic, physiological, environmental and behaviors factors. According to WHO non-communicable diseases accounted for 71% (41 million) of a total of 57.7 million deaths globally. Of these, 80% (32.8 million) were attributed to cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases.[1] About 80% of these NCD deaths (28 million) were recorded in low- and middle-income countries.[2]

Depression is a mental illness that influences the whole individual and characterized through loss of activity or pleasure, depressed mood, emotions of guilt or low self-worth, disturbed sleep or appetite, low energy, and terrible concentration. It is a treatable circumstance and can motive serious problems if left untreated. Chronic forms of morbidity like mental disorders and hypertension, impacts in the burden of disease in the developing world.[3-4] World Health Organization (WHO) states that depression is the main cause of disability as measured by Years Lived with Disability (YLDs) and the fourth leading contributor to the global burden of disease and will be the second main contributor by the year 2020.[5]

Hypertension has been emerging rapidly as a major public health problem in developing countries. Several factors contribute in hypertension including genetic factors, psychosocial factors, and behavioral factors. One of the psychosocial factors is depression, which is associated with variety of known CVD risk factors.[6-7] The mechanism between hypertension and depression is complex. Patients with chronic illness, like hypertension, may experience negative emotions that in these patients increase the risk of mental disorders, most commonly depression and anxiety disorders.[8-9]

The studied aims to find out prevalence of depression and factors associated with depression among hypertensive patients of selected hospitals in Pokhara Metropolitan City.

METHODS

This was cross sectional study in four hospitals of Pokhara, Nepal from August 2018 to October 2018. Hospitals were selected through systematic random sampling and proportionate random sampling technique was used according to hypertensive patients

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flow in outpatient department of each hospital. Two hundred and fifteen hypertensive patient's aged 18 to 65 years were selected from both government and private hospitals.

Ethical approval was taken from the Institutional Review Committee, Pokhara University. Along with this approval taken from concern hospital and written informed consent was obtained from the participants. Anonymity, confidentiality, and privacy of information was maintained. If any misconception or risk behavior was found among participants during the study, then they provide suggestion for maintain healthy behavior for prevention of complication related to hypertension.

Operational Definition
Socio-demographic and behavioral information
Participants were interviewed and taking information regarding age, sex, ethnicity, family type, education, monthly income, physical activity, diet and life style factors (e.g. smoking and alcohol intake) were collected.

Disease related information
Participants were interviewed about disease related information (e.g anti- hypertension medication, duration of diagnosis disease, complication and psychiatric related medication and family history) were collected.

Depression
Depression assessments were made via Beck Depression Inventory (BDI-Ia). The BDI-Ia is a scale of 21 items with four response options, which assesses and quantifies the number of depressive symptoms across broad domains such as sadness, hopelessness, feeling of guilt, changes in sleep, and appetite. Patients was asked to recall events from the week before the interview. Items are scored 0–3 with an instrument range of 0 to 62. The BDI-la is validated for use in Nepal and free access.[10] Clinical based validation of the BDI in Nepal, a score of 20 or greater advises moderate depression symptoms with the need intervention (sensitivity = 0.73, specificity = 0.91).[10] Therefore, in this study, we refer BDI ≥ 20 as "depression" and BDI ≤ 20 as "non depression" in categorical analyses.

RESULTS

Table 1: Socio-Demographic characteristics of participants

Characteristics	Frequency (n)	Percentage (%)
Age (Years)		
< 44	70	32.6
44-56	73	34.0
≥ 57	72	33.5
Mean Age= 52 ±12.04 years		
Sex		
Male	126	58.6
Female	89	41.4
Ethnicity		
Upper caste	127	59.1
Janajati	47	21.9
Dalit	29	13.5
Others	12	5.6
Marital Status		
Married	189	87.9
Never married/single	26	12.1
Family Type		
Joint	124	57.7
Nuclear	91	42.3
Education		
Illiterate	43	20.0
Able to read or write	17	7.9
Primary level	56	26.0
Secondary level	60	27.9
Graduate and above	39	18.1
Employment status		
Unemployed	61	28.4
Service	50	23.3
Self-employed	40	18.6
Agriculture	40	18.6
Others	24	11.2
Monthly income of the family		
≥ Nrs. 25,000 Nrs	121	56.3
< Nrs. 25,000 Nrs	94	43.7
Family support in treatment		
Yes	205	95.3
No	10	4.7

Table 1 illustrates socio- demographic characteristics of two hundred fifteen respondents. The proportion of age group roughly equal among three groups and median age of respondent was 52 ± 12. More than half were male respondent and nearly sixty percent of participants belonged to higher caste. Nearly eighty percentage of the respondents were married. More than the half belongs to joint family and nearly twenty-eight percentage respondent complete the secondary level education and followed by primary level education and illiterate respondent were 20%. The proportion of occupation status is nearly twenty-nine percentages were unemployed and the proportion of self-employed and agriculture are equal. More than a half respondent's family income is equal to NRs. 25,000/-.

Table 2: Behavioral status of participants

Characteristics	Frequency (n=215)	Percentage (%)
History of smoking		
Never smoker	141	65.6

Ex-smoker	31	14.4
Current smoker	43	20.0
History of alcoholism		
Never alcoholic	127	59.1
Ex-alcoholic	32	14.9
Current alcoholic	56	26.0
Physical activity		
< 150 minutes/ week	115	53.5
≥ 150 minutes/ week	100	46.5
Fruits and green vegetables		
< 2 servings/ day	114	53.0
≥ 2 servings/ day	101	47.0

Table 2 Behavioral status respondent shows that most of respondent never smoke and drink alcohol in their life. The proportion of physical activity less than 150 minutes/week and more than equal to 150 minutes/week are nearly equal. Fruits and vegetables consumption less than 2 servings/day and more than equal to 2 servings/day are also nearby equal.

Table 3: Disease related characteristics of participants

Characteristics	Frequency (n=215)	Percentage (%)
Anti-hypertensive Medication		
Yes	136	63.3
No	79	36.7
Duration of diagnosed hypertension		
≥ 3 years	134	62.3
< 3 years	81	37.7
Family history of hypertension		
No	116	54.0
Yes	99	46.0
Any chronic illness		
No	123	57.2
Diabetes	58	27.0
Thyroid/ Uric acid	12	5.6
Asthma	8	3.7
Others	14	6.5
Use of anti-depressants		
Yes	17	7.9
No	198	92.1
Sleep duration		
≥6 hours/day	141	65.6
< 6 hours/day	74	34.4

Table 3 shows that more than sixty-three percentage respondents take anti-hypertensive medicine. The average period of diagnosed hypertension among the participants was 3 ± 5.7 years. Most of respond have not family history of hypertension and any chronic illness. Minimum respondent use anti –depressants medicine and near about sixty-six percentages have greater than or equal to six hours per day sleep duration.

Table 4: Status of depression among participants

Characteristics	BDI Score	Frequency (n)	Percentage (%)
Depression	≥ 20	78	36.3
No Depression	< 20	137	63.7

Table 4 shows the status of depression among the respondents, which show slight more than thirty-six percentages were found at depression status and rest of others at no depression status.

Table 5 : Proportion of participants who experienced depression scores

BDI items	Mean ± SD	Depression	
		(n)	(%)
Total BDI-Ia score	16.88±16.45	78	36.3

Table 5 indications the mean score of depression among hypertensive patients. The mean BDI-Ia score for depression status respondent was 16.88±16.45. Association of Demographic Characteristics of Participants with Depression

Table 6 : Association of socio- demographic characteristics of participants with depression status

Variables	Depression (BDI ≥ 20)	No Depression (BDI < 20)	p-value
Sex			
Male	34 (27.0%)	92 (73%)	0.001**
Female	44 (49.4%)	45 (50.6%)	
Age			
≤ 40 years	13 (23.2%)	43 (76.8%)	0.018*
≥ 41 years	65 (40.9%)	94 (59.1%)	
Ethnicity			
Upper caste	45 (35.4%)	82 (64.6%)	0.757
Lower caste and others	33 (37.5%)	55 (62.5%)	
Family Type			
Joint	41 (33.1%)	83 (66.9%)	0.252
Nuclear	37 (40.7%)	54 (59.3%)	
Marital status			
Married	62 (32.6%)	128 (67.4%)	0.002**
Single	16 (64.0%)	9 (36.0%)	
Education			
Never attended school	36 (60%)	24 (40%)	
Basic level	21 (37.5%)	35 (62.5%)	0.001**
Secondary level	15 (25.0%)	45 (70.0%)	
Graduate and above	6 (15.4%)	33 (84.6%)	
Employment status			
Unemployed	42 (49.4%)	43 (50.6%)	0.001**
Employed	36 (27.7%)	94 (72.3%)	
Monthly income of the family			
< 25,000 Nrs	44 (46.8%)	50 (53.2%)	0.005**

≥ 25,000 Nrs	34 (28.1%)	87 (71.9%)
Family support in treatment		
Yes	72 (35.1%)	133 (64.9%)	0.175#
No	6(60.0%)	4 (40.0%)

Table 6 showed the association between socio-demographic variables and depression status among the hypertensive respondents, age, marital status, education, employment and monthly income have significant association with depression.

Table 7: Association of behavioral characteristic with Depression status

Variables	Depression (BDI ≥ 20)	No Depression (BDI < 20)	p-value
History of smoking			
Ex- smoker	15 (48.4%)	16 (51.6%)	
Current smoker	13 (30.2%)	30 (69.8%)	0.261
Never smoker	50 (35.5%)	91 (64.5%)	
History of alcoholism			
Ex-alcoholic	10 (31.2%)	22 (68.8%)	
Current alcoholic	17 (30.4%)	39 (69.6%)	0.393
Never alcoholic	51 (40.2%)	76 (59.8%)	
Physical activity			
<150 minutes/week	49 (42.6%)	66 (57.4%)	0.038*
≥150 minutes/week	29 (29.0%)	71 (71.0%)	
Fruits and green vegetables			
< 2 servings/ day	49 (43.0%)	65 (57.0%)	0.030*
≥ 2 servings/day	29 (28.7%)	72 (71.3%)	

Table 7 shows the association of behavioral characteristic with depression status, hypertensive respondent's physical activity and fruits & vegetables consumption is significant association with depression.

Table 8: Association of disease-related characteristics of respondents with depression status

Variables	Depression (BDI ≥ 20)	No Depression (BDI < 20)	p-value
Anti-hypertensive Medication			
Yes	56 (41.2%)	80 (58.8%)	0.050
No	22 (27.8%)	57 (72.2%)	
Duration of diagnosed hypertension			
< 3 years	30 (37.0%)	51 (63.0%)	0.857
≥ 3 years	48 (35.8%)	86 (64.2%)	
Family history of hypertension			
Yes	33 (33.3%)	66 (66.7%)	0.407
No	45 (38.8%)	71 (61.2%)	
History of chronic illness			
Yes	42 (45.7%)	50 (54.3%)	0.013*
No	36 (29.3%)	87 (70.7%)	
Psychiatric illness in family			
Yes	15 (75.0%)	5 (25.0%)	0.001**
No	63 (32.3%)	132 (67.7%)	
Sleep duration			
< 6 hours/day	36 (48.6%)	38 (51.4%)	0.006**
≥ 6 hours/day	42 (29.8%)	99 (70.2%)	

Table 8 illustrates association behavioral characteristic and depression. Two variables were found statistically significant (p <0.05). Physical activity (χ^2_1=4.285) and intake of fruits and vegetables (χ^2_1=4.285) were significantly associated with depression status.

DISCUSSION

As per the clinically validated cutoff in Nepal (BDI ≥ 20) is considered as depression requiring mental health intervention.[10] A cross sectional study conducted in urban setting of Nepal shows the prevalence of undiagnosed depression was 15%[11] which is quite lower than this study. The cross-sectional study based on country-representative data obtained from WHO's World Health Survey (WHS) shows that the prevalence of being ever diagnosed with depression was highest in Nepal (38.7%).[2] Socio-demographic variables like age, sex, marital status, education, employment status and monthly income were association with depression and all these variables are also found to be significantly associated with hypertension,[3,13,14] which shows that both the conditions i.e. hypertension and depression, shares a common pathway. This study showed the higher depression status among participants who never attended school in their lifetime than those who attended (p=0.015, OR=3.240, CI=1.261-8.321). Illiteracy, being female and ageing had a direct relationship with depression in this present study, which is similar to the cross-sectional study conducted at urban setting of Nepal.[11]

In this study, depression used to be in increasing style with the increase in age however longitudinal study conducted in Europe[15] and a cross-sectional find out about in Netherland[6] has said the decreasing trend of depression with the increase in age. Elevated depression scores have been greater common amongst individuals who had been female or much less educated in this study, which is comparable to a seem to be AHEAD study trial carried out in USA.[16]

In this study, life-style related variables like physical activity and intake of fruits and green vegetables were found to be significantly associated with depression which is similar to the population-

based prospective cohort study conducted in Washington[13] secondary data analysis from cross-sectional survey in Austria[18] and cross-sectional study in France.[17] Participants consuming fruits and green vegetables less than 2 servings/day were found to be more depressed than who consumed more than or equal to 2 servings/day.

This study showed that there is no significant association between history of smoking and depression which is contrast to the study carried out at urban Nepal and teaching hospital of Nigeria.[11, 19] In this study there is no association between history of alcohol consumption and depression, which is similar to cross-sectional study of Brazil.[20]

In this study, participants having other chronic illness and participants having psychiatric illness in their family were more depressed than who had not, which is similar to the cross-sectional study conducted in south-east Ethiopa.[21] This study revealed that duration of diagnosed hypertension and family history of hypertension had no association with depression, which is similar to the cross-sectional study conducted in Nepal. Also, anti-hypertensive medications showed no association with depression, which is similar to the cross-sectional study in Nepal[11] and a longitudinal survey in the USA.[22]

According to this study, short sleep period (p=0.021, OR=2.460, CI=1.143-5.292) was found significantly related to depression, that is comparable to the longitudinal study conducted in China

CONCLUSION

This study shows around one-third of the hypertensive patients had depression. The different socio-demographic factors, (i.e. sex, age, marital status, employment and income sources) and behavioral factor such as physical activity and fresh fruits intake connected factors were found considerably related to depression during this study. History of other chronic disease, psychiatric illness in family member and sleeping condition of patient also concern with the depression. This study suggest that treatment of hypertension is not only intervention for the quality of life of patient also screening of mental illness among chronic ill patients. Psychological and physical activities are also important part for the maintain of quality of life.

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