Research Article

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Depression among diabetic patients visiting a diabetes center in Nepal

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Abstract

Introduction: Depression is a major co-morbidity associated with diabetes. This study aims to assess the prevalence and determine factors associated with depression among diabetic patients visiting a diabetes center in Lalitpur, Nepal.

Methods: This is a cross-sectional study of diabetic patients visiting a diabetes center in Kathmandu, Nepal. 203 diabetic patients were recruited in a period of two months. A validated and reliable Beck Depression Inventory Scale was used to identify and classify depression. Diabetes status was self-reported.Prevalence of depression, socio-demographic and diabetes related characteristics were calculated using frequency and percentages. Association was analyzed using chi-squared test. Statistical significance was determined at $p<0.05$. Bivariate logistic regression was performed to identify unadjusted odds ratio with 95% CI. Then, multivariate logistic regression model was designed for those variables significant at bivariate level to calculate adjusted odds ratio with 95% CI.

Results: The prevalence of depression among diabetic patients was 34% (Mild - 17.7%, Moderate - 13.8% and Severe - 2.5%). Diabetic patients with secondary or above educational level were less than half likely to be affected by depression compared to patients with no formal school education [AOR:0.42]. Similarly, diabetic patients on insulin therapy were twice likely to be affected by depression compared to patients on oral hypoglycemic agents [AOR: 2.08] and patients having other comorbidity along with diabetes were also twice likely to be affected by depression [AOR:2.18]. Patients with stressful life events in the past were twelve times more likely to have depression compared to patients with no such events in the past [AOR: 12.33].

Conclusion: More than one third of the diabetic patients have some degree of depression. Factors such as no schooling, being on insulin therapy, having other comorbid conditions along with diabetes and stressful life events in the past among diabetic patients kept them at higher risk of depression. These factors should be focused in program for prevention and control of depression among diabetic patients in Nepal.

Key words: Diabetic patients, Depression, Beck Inventory Scale, Associated factors.

Tweetable Abstract: More than one third of diabetic patients were found to have undiagnosed depression in a care center in Nepal.

Introduction

Diabetes mellitus is increasing rapidly globally and the number of affected people is expected to reach over 366 million by the year 2030 [1]. Depression frequently occurs together with diabetes, although it is unrecognized and untreated approximately in two thirds of patients with both conditions. The course of depression in patients with both diabetes and depression is chronic and severe. More than 80% of patients with diabetes and depression experience a relapse of depressive symptoms over a 5-year period [2].

Studies have shown that diabetes was found to double the likelihood of having depression among diabetic patients when compared with non-diabetic patients [3]. Depression is found to increase the incidence of both macro vascular and micro vascular complications. It is also found to reduce quality of life and decrease compliance with medications and healthy lifestyle measures such as dietary regimes and exercise. It thereby increases health care use and expenditures and the risk of cardiovascular mortality due to poor control of hyperglycemia [4,5]. Recognition of depression is important to improve diabetic care because treatment is easily available and cost-effective [6].

There are very few evidences on prevalence and associated factors of depression among diabetic patients in Nepal. This study aimed to identify the prevalence of depression and its associated factors among diabetic patients visiting a diabetic care center in Kathmandu valley, Nepal.

Methods

This study was an institution based cross-sectional study that enrolled 203 diabetic patients in an endocrinology care centre, Lalitpur in Nepal. All the patients who visited the endocrinology care centre from 7 July to 21 July 2013 were recruited for the study purpose. Inclusion criteria for the study participants was patients with diagnosis of diabetes for more than 1 year and those aged above 20 years. Patients were excluded if they had previous history of depression, unconsciousness and with other psychotic disorders.

Beck Depression Inventory scale (Nepali translated version) of Tribhuvan University Teaching Hospital (TUTH) was used for assessing and measuring severity of depressive symptoms.

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The BDI scores and cases were categorized into "no depression (0-13)","milddepression (14-19)", "moderate depression (20-28)" and "severe depression (29-63)". The Nepali version of TUTH BDI scale at cut off score 13/14 has sensitivity 0.93 and specificity 0.78 [7].

Structured interview schedule in Nepali version was used to gather required information from the participants through face to face interview technique at outpatients setting. BDI Score was used to explore the prevalence of depression.

Data were entered and analyzed on SPSS version 17. Status of depression, socio-demographic and diabetes related characteristics were calculated using frequency and percentages. Confidence Interval at 95% was calculated to estimate prevalence of depression among diabetic patients. Bivariate analysis was performed using cross tabulation and association was identified using chi-squared test. Statistical significance was determined at $p<0.05$. Bivariate logistic regression was performed on factors with significant p value to identify unadjusted odds ratio with 95% CI. Then, multivariable logistic regression model was used to control confounding and calculate adjusted odds ratio with 95% CI. The adjusted variables were marital status, educational level, blood sugar level, treatment modality of diabetes, presence of co-morbidity, family support and stressful life events in the past.

Research proposal was approved by research committee of Nursing Campus Maharajgunj. Official request letter was submitted to administration of diabetes thyroid and endocrinology care centre and written permission was taken to conduct research. The purpose and the procedure of the study was explained to the participants including the autonomy during the process of informed written consent with each participants.

Results

Among the 203 study participants, 60.6% of them were between age 40-60 years and 83.3% were from inside Kathmandu valley and belonged to relatively advantage Janjati ethnic group (54.7%). Most of the participants (89.1%) were married and 53.2% lived in joint family. The distribution of participants according to their socio-demographic characteristics is given in Table 1.

Table 1: Socio-demographic characteristics of the study participants (n= 203)

Variables	Frequency	Percentage
Age		
21-60 years	12	5.9
41-60 years	123	60.6
Above 60 years	68	33.5
Sex		
Male	102	50.2
Female	101	49.8
Address		
Inside Kathmandu Valley	169	83.3
Outside Kathmandu Valley	34	16.7
Ethnicity		
Dalit	3	1.5
Disadvantaged Janajatis, Madhesi and religious minorities	17	8.4
Relatively advantaged Janajatis	111	54.7
Upper caste group	72	35.5
Marital Status		
Married	181	89.1
Unmarried	6	3.0
Widow	16	7.9
Family type		
Nuclear	95	46.8
Joint	108	53.2
Occupation		
Retired	57	28.1
House wife	53	26.1
Business	45	22.2
Services	37	18.2
Others	11	5.4
Economic Status		
Rich	112	55.2
Average	78	38.4
Poor	13	6.4
Educational Level		
Illiterate	43	21.2
Literate	5	2.4
Primary	17	8.4
Secondary	24	11.8
SLC	27	13.3
Intermediate	32	15.8
Bachelors	39	19.2
Masters	16	7.9

The overall prevalence of depression with 95% CI was 34% (27.5%-41.0%). The level of depression with 95% CI was mild 17.7% (12.7%-23.7%), moderate 13.8% (9.4% – 19.3%) and severe 2.5% (0.8%-5.7%). (Table 2)

Table 2: Depression among diabetic patients (n= 203)

Depression among diabetic patients	Frequency	Percentage (95% CI)
Prevalence of Depression		
No depression	134	66.0 (59.0-72.5)
Depression	69	34.0 (27.5- 41.0)
Level of depression		
No depression (0-13)	134	66 (59.0 - 72.5)
Mild depression (14-19)	36	17.7 (12.7 - 23.7)
Moderate depression (20-28)	28	13.8 (9.4 - 19.3)
Severe depression (29-63)	5	2.5 (0.8 - 5.7)
Total	203	100.0

Among the socio-demographic characteristics, depression was associated with marital status and educational level of the study participants. (Table 3)

Table 3: Association of socio-demographic characteristics with depression among diabetic patients (n= 203)

Characteristics	No Depression n (%)	Depression n (%)	P value
Sex			
Male	70 (68.6%)	32 (31.4%)	0.428
Female	64 (63.4%)	37 (36.6%)	
Age group			
20-40 years	8(66.7%)	4(33.3%)	0.223
41-50 years	39 (78%)	11 (22.0%)	
51-60 years	45(61.6%)	28 (38.4%)	
Above 60 years	42(61.8%)	26(38.2%)	
Address			
Inside Kathmandu valley	114 (67.5%)	55(32.5%)	0.332
Outside Kathmandu valley	20 (58.8%)	14 (41.2%)	
Ethnicity			
Disadvantaged Janjatis and Dalits	14(70.0%)	6 (30.0%)	0.545
Relatively advantaged Janajatis	76(68.5%)	35 (31.5%)	
Upper caste group	44(61.1%)	28 (38.9%)	
Marital status			
Married	124(68.5%)	57(31.5%)	0.031*
Unmarried or widow/widower	10(45%)	12(55%)	
Occupation			
Services	26(70.3%)	11(29.7%)	0.354
Business	31(68.9%)	14 (31.1%)	
House wife	37(69.8%)	16 (30.2%)	
Retired	33(57.9%)	24 (42.1%)	
Others (Agriculture and unemployed)	5(45%)	6 (55%)	
Family type			
Nuclear	63(66.3%)	32(33.7%)	0.930
Joint	71(65.7%)	37 (34.3%)	
Economic status			
Average	47(60.3%)	31 (39.7%)	0.066
Poor	6(46.2%)	7 (53.8%)	
Rich	81(72.3%)	31 (27.7%)	
Education level			
No schooling	26(54%)	22(46%)	0.042*
Primary	9(52.9%)	8 (47.1%)	
Secondary or above	99(71.7%)	39 (28.3%)	

Among the diabetes related characteristics, blood sugar level, treatment modality of diabetes, presence of co-morbid diseases, family support and stressful life events were significantly associated with depression. (Table 4)

Table 4: Association of diabetes related characteristics and depression (n= 203)

Characteristics	No Depression n (%)	Depression n (%)	P value
Duration of diabetes			
1-3 years			
4-9 years	44(74.6%)	15(25.4%)	0.133
10 years or more	30(56.5%)	23(43.5%)	
	60 (65.6%)	31(34.4%)	
PP sugar level			
Below 200 mg/dl	93 (72.1%)	36 (27.9%)	0.016*
200 mg/dl and above	41 (55.4%)	33 (44.6%)	
Fast blood sugar level			
Below 125 mg/dl			
125 mg/dl and above	74 (72.5%)	28 (27.5%)	0.048*
	60 (59.4%)	41 (40.6%)	
BMI			
16-18	4(80%)	1(20%)	0.546
19-25	79(68.1%)	37(31.9%)	
26-30	45(64.3%)	25 (35.7%)	
>30	6(50%)	6 (50%)	
HBA1C level			
4.5-7%	43(63.2%)	25 (36.8%)	0.055
>7%	91(67.4%)	44 (32.6%)	
Exercise duration (hrs/week)			
0	29(59.2%)	20 (40.8%)	0.671
0.5-3	41(66.1%)	21 (33.9%)	
4-10	59(69.4%)	26 (30.6%)	
11-16	5(71.4%)	2 (28.6%)	
Treatment modality of diabetes			
Oral Hypoglycemic agents	86(72.9%)	32(27.1%)	0.014*
Insulin therapy	48(56.5%)	37(43.5%)	
Presence of co-morbid diseases			
No any co morbid disease	34(87.2%)	5(12.8%)	0.001*
Having co-morbid disease/s	100 (61%)	64(39%)	
Family support			
Yes	133(67.9%)	63 (32.1%)	0.003*
No	1(14.3%)	6 (85.7%)	
Stressful life events			
Yes	1(12.5%)	7 (87.5%)	0.001*
No	133(68.2%)	62 (31.8%)	
Family history			
Positive	3(37.5%)	5(62.5%)	0.082
Negative	131(67.2)	64(32.8%)	

Among the socio-demographic and diabetes related factors, the factors which showed significant association with depression (marital status, educational level, blood sugar level, treatment modality of diabetes, presence of co-morbid diseases, family support and stressful life events) were taken into logistic regression analysis and adjusted and unadjusted odds ratio with 95% CI were calculated. After controlling confounding, secondary and above schooling

level compared to no schooling [AOR: 0.42 (0.19-0.90)], patients in insulin therapy compared to hypoglycemic agents [AOR: 2.08 (1.06-4.05)], patients having other comorbid diseases compared to not having them [AOR: 2.18 (1.13-4.22)] and patients having stressful life events compared to not having them in the past [AOR: 12.33 (1.23–123.27)] were found statistically significant with depression in the final model. (Table 5)

Table 5: Factors affecting depression among diabetic patients from regression analysis (n= 203)

Characteristics	Unadjusted odds ratio (95% CI)	P value	Adjusted odds ratio (95% CI)	P value
Marital status				
Married	1		1	
Unmarried or Widow/ Widower	2.61 (1.06 - 6.39)	0.036*	1.39 (0.46-4.15)	0.554
Education Level				
No Schooling	1		1	
Primary	1.05 (0.34 – 3.81)	0.931	0.76 (0.20-2.85)	0.695
Secondary	0.46 (0.23 – 0.91)	0.027*	0.42 (0.19-0.90)	0.026*
PP sugar level				
Below 200 mg/dl	1			
200 mg/dl and above	2.07 (1.14-3.78)	0.017*	1.77 (0.87 – 3.59)	0.111
Fast Blood sugar level				
Below 125 mg/dl	1		1	
125 mg/dl and above	1.80 (1.002 – 3.25)	0.049*	1.25 (0.62–2.52)	0.526
Treatment modality of diabetes				
Oral hypoglycemic agents	1		1	
Insulin therapy	2.07 (1.14 - 3.73)	0.409*	2.08 (1.06-4.05)	0.032*
Presence of co-morbid diseases				
No	1		1	
Yes	2.10 (1.16 – 3.79)	0.014*	2.18 (1.13-4.22)	0.020*
Family support				
Yes	1		1	
No	12.66 (1.49 – 107.45)	0.020*	9.41 (0.95-92.72)	0.055
Stressful life events				
Yes	15.01 (1.80 – 124.70)	0.012*	12.33(1.23 – 123.27)	0.032*
No	1		1	

Discussion

The study showed quite high prevalence of depression among Nepali diabetic patients. The overall prevalence was 34% in which 17.7% were mild, 13.8% were moderate and 2.5% were severely depressed. Similar studies reported slightly higher prevalence from South India (37.5%), North India (41%) and Saudi Arabia (49.6%) respectively [8-10].

This study at bivariate analysis found among socio-demographic characteristics, marital status and education level were significantly associated with depression while in multivariable logistic regression analysis only secondary and above level education was found to have significantly low depression compared to no schooling. A study in Saudi Arabia also showed marital status significantly associated with depression [10] while a study done in Nigeria showing contrasting findings to this study that income and family size associated with depression among diabetic patients [11]. This may be because of not enough power of this study to detect the association. Previous studies showed comorbid conditions and increased fasting glucose level were significantly associated with depression [8,12]. Also, family support influences the psychosocial outcomes in diabetes patients [13]. A study in Ethiopia also showed similar findings that negative life events and poor social support were significantly associated with depression among diabetic patients [14]. Our findings on the association of treatment modality with depression is supported by a previous study which showed oral hypoglycemic therapy is potentially safer and caters less risk of depression in comparison to intensive management using multiple daily injections [15].

This study was limited to patients visiting a privately run care center in Kathmandu valley so these patients may not represent all diabetic patients in Nepal. Despite this limitation, the magnitude and associated factors identified by this study might be useful for programs to control depression among diabetes patients in Nepal.

Conclusion

More than one third of the diabetic patients had some degree of undiagnosed depression. Factors like no schooling, being on insulin therapy, having comorbid conditions and stressful life events increased the chances of developing depressive symptoms. Mental health counselling and education is an immediate priority for those with depressive symptoms and can benefit from regular glucose monitoring and screening of depression.

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Conflict of interest

None declared.

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