Prevalence & Risk Factors of Depression Among Patients Undergoing Hemodialysis at The Buea Regional Hospital

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Abstract

Background: Depression being one of the most common psychiatric disorders, is under-recognized in patients undergoing hemodialysis. Depression in hemodialysis patients is associated with many adverse outcomes.

Aim: This study sought to determine the prevalence of depression among hemodialysis patients and identify its associated factors

Method: The study employed a hospital based cross-sectional design. Purposive and convenient samplings were used to select the study site and enroll participants to the study. The study was conducted in the Hemodialysis Center at the Buea Regional Hospital (BRH) in Fako Division, South West Region of Cameroon. The study participants were made up of hemodialysis parents who were aged 21years and above. Respondents who met the inclusion criteria and gave their consent to participate in the study were selected. The Beck's Depression Inventory (BDI) scale was used to determine the prevalence of depression among patients and identify risk factors. Data collected was coded and entered into EPI and exported to SPSS version 23 for analysis.

Results: A total of 69 respondents participated in the study. The study revealed that the prevalence of depression among patients on hemodialysis in the BRH was 47.7%. Gender, age, level of education, employment status, income level, marital status, family structure, role of patients in family, quality of care rendered by health care provider and level of pain felt by patients were significantly associated with depression among the study participants (p<0.05).

Conclusion: The study concluded that there is a high prevalence of depression among patients undergoing hemodialysis at the BRH. The high prevalence is significantly associated with predominant risk factors. Education on the coping mechanisms for depression is needed in order to decrease levels of depression amongst hemodialysis patients.

Keywords: prevalence; risk factors; depression; hemodialysis patient; south west region

Introduction

Depression is a common mental disorder that affects about 264 million people worldwide [1]. It is a leading cause of disability worldwide and adds greatly to the global burden of disease. Depression has long-lasting or recurrent effects which can negatively affect a person's ability to function and live a rewarding life [2]. Among end stage renal disease (ESRD) patients on hemodialysis, depression is one of the most common psychiatric disorders with higher prevalence than in the normal population. Despite this it is under-recognized in this group and existing literature does not provide enough information regarding the risk factors of depression among Hemodialysis patients (HD) patients [3]. Hence, it is necessary to determine the prevalence and identify risk factors of depression among HD patients.

It was reported in a journal from WHO in Pamela Cowan leader post that, depression will be a leading cause of disease by 2020 [4]. According to reports from WHO response, depression is one of the priority conditions covered by WHO's mental health Gap Action Programme (mhGAP) [5]. There is a rising incidence and prevalence of kidney failure in the United States, with poor outcomes and high cost. Chronic kidney disease (CKD) is more prevalent in the elderly population and Hemodialysis (HD) remains the main renal replacement in most countries globally [6]. There are more than 1.7 million patients currently on HD in about 28,500 dialysis units worldwide. The total prevalence of CKD in Cameroon is unknown; however, prevalence in the population of the Western Region of Cameroon was estimated to be 13.2% and it has been estimated that more than 70% of patients with ESRD will be resident in low-income countries [7]. These reports have triggered the need for more studies in our community. The annual mortality in HD patients varies from 10% to 25% internationally, depending on demographic and possibly genetic factors[8]. Therefore, there is a strong need to research on the risk factors of depression amongst HD patients since mental factors may also cause mortality amongst this population of patients.

Important factors contributing to the development of depression and anxiety in patients with CKD on HD have been revealed by existing epidemiological studies. Patients with certain social, psychological, and clinical characteristics were found to be more prone to falling into depression [9]. Such findings provide practitioners with vital indicators to identify and assess HD patients for psychiatric disorders more efficiently. Also, the availability of machines for dialysis is one of such factors contributing to depression amongst HD patients [10]. Previous study found that cultural differences, health and health care policies, and economic conditions could contribute to depression in HD patients [11]. Though HD makes its users to feel better and live longer, it involves a lot of their time [12].

The prevalence of depression among patients with end-stage renal disease (ESRD) on (HD) was found to be up to 46% [13]. The global prevalence rates of depression and anxiety in 2015 were estimated by WHO to be 4.4% and 3.6%, respectively, with an increase in reported cases of 18% between 2005 and 2015 [14, 15]. However, there is not enough literature showing global estimates for prevalence of depression among HD patients in our setting. Depressive symptoms significantly influence the quality of life and is independently associated with poor quality sleep [16]. Despite this, depressive symptoms are not usually included as a clinical parameter in the evaluation of hemodialysis patients and often goes undetected and untreated among people with ESRD and CKD on maintenance dialysis. There is absolutely a strong need to screen and evaluate depression among hemodialysis patients.

Therefore, we sought to determine the prevalence of depression and to identify its risk factors among HD patients. This study will provide a framework which will serve as a guide for health care providers especially nurses to plan and deliver appropriate nursing care to parents. This may in turn decreased mortality, improved quality of life and dialysis outcome in these patients.

Materials And Methods

A hospital-based cross-sectional study was conducted from March to August, 2020 to determine the prevalence of depression and to identify its risk factors among patients undergoing hemodialysis in the renal clinic of the Buea Regional Hospital (BRH).

Both qualitative and quantitative approaches were employed to collect and process data. The Beck's Depression Inventory (BDI) was used to determine the prevalence of depression. This scale consists of 21 queries with graduated answers from 0 to 3 that addresses issues such as sadness, guilt, tiredness, concern with personal appearance, being able to work, sexual interest, and other issues [17]. This tool has been proven to have a good reliability and validity; participants with BDI score of ≥17 was considered to be depressed [18]. The first section of this questionnaire collected data on participants' socio-demographic and clinical characteristics. The target population was made up of all patients registered for hemodialysis at the BRH Hemodialysis Center who were aged ≥21years and have been on maintenance hemodialysis for ≥3months. Eligible participants were recruited using purposive and consecutive convenience sampling methods. Patients with physical and cognitive impairment, those who could not understand English or French, and patients referred for emergency dialysis in the BRH were excluded from the study.

The BRH hemodialysis center is the only center in the South West Region of Cameroon rendering dialysis services to a population of about 1, 390,274 inhabitants. This hemodialysis center serves clients within Buea and environs, and records a total of 80 registered clients. A sample of 69 patients who registered for hemodialysis at the BRH Hemodialysis Center participated in the study. Levels of depression were defined as used in a previous study (1-10; normal, 11-16; mild mood disturbance, 17-20; borderline clinical depression, 21-30; moderate depression, 31-40; severe depression and >40; extreme depression) [19].

Before administering the questionnaire, it was pre-tested by administering 20 copies to 20 patients who were not part of the study population; some questions were rephrased for clarity. Copies of the questionnaire were then administered to the study participants who completed the various sections of the questionnaire. The investigator read the questions for those who could not read and their responses were written down. This study received Ethical Clearance from the Institutional Review Board of the Faculty of Health Sciences, University of Buea, Cameroon. In addition, administrative authorisation was obtained from the Regional Delegation of Public Health and then from the head of the center. Before responding to the questionnaire each respondent gave consent by signing the consent form.

Data collected was entered into EPI data and exported to SPSS Version 23 for analysis. Statistical significance was set at 95% Confidence interval, with a P value <0.05. Comparisons between proportions were made using the chi square test. Prevalence was calculated as: Prevalence = (N/n × 100). Where; N=number of participants screened of borderline clinical depression to severe depression, and n=total number of participants in the study. To identify the risk factors of depression, Chi-squared test was used to establish the association between variables. Both bivariate and multivariable analyses were performed using logistic regression and odd ratios (OR) at 95% confidence intervals.

Results

A total of 69 copies of the questionnaire were administered to participants and 67 copies were completed and returned, thereby giving a response rate of 97.1%. Majority (64.2%) of the study participants were males, 56.7% were in the age range 40-60 years, 37.3% had tertiary education and 64.2% were married. More than half (53.7%) were fathers and the majority (72.6%) belonged to monogamous families (Table 1a).

Variables	Parameter	n (%)
Gender	Female	24 (35.8)
	Male	43 (64.2)
	Total	**67 (100.0)**
Age (years)	21-39	16 (23.9)
	40-60	38(56.7)
	>60	13 (19.4)
	Total	**67 (100.0)**
Education	Primary	18(26.9)
	Secondary	24 (35.8)
	Tertiary	25(37.3)
	Total	**67 (100.0)**
Marital status	Married	43 (64.2)
	Single	24 (35.8)
	Total	**67 (100.0)**
Patient's role in family	Child	9 (13.4)
	Father	36 (53.7)
	Mother	22 (32.8)

	Total	**67 (99.9)**
Family structure	Monogamy	48 (72.6)
	Polygamy	4 (6.0)
	Single parent	15 (22.2)
	Total	**67 (100.0)**

Table 1a: Socio-demographic and Clinical Characteristics of Study Participants

Most of the study participants resided in Buea (53.7%), 90.4% were Christians, 43.3% were unemployed, 46.2% earned less than 50,000FCFA in a month while 64.2% reported that they were supported by their family members. For the clinical characteristics, majority (55.2%) of the study participants have had chronic kidney disease for between 1-5 years, 44.8% have been on dialysis for between 2-5 years, and 92.5% had fistulas in place (Table 1b).

Variables	Levels	n (%)
Town of resident	Buea	36 (53.7)
	Douala	1 (1.5)
	Kumba	15 (22.4)
	Limbe	10 (14.9)
	Muyuka	1 (1.5)
	Tiko	4 (6.0)
	Total	**67 (100.0)**
Religion	Christain	63 (90.4)
	Muslim	4 (6.0)
Employment status	Employed	11 (16.4)
	Self employed	17 (25.4)
	Retired	10 (14.9)
	Unemployed	29 (43.3)
	Total	**67 (100.0)**
Monthly income	<50,000	31 (46.2)
	50-100,000	18 (26.9)
	>100,000	18 (26.9)
	Total	**67 (100.0)**
Source of support system	Family	43 (64.2)
	Self	20 (29.8)
	Friends	2 (3.0)
	Church	2 (3.0)
	Total	**67 (100.0)**
Duration of disease	<1yr	16 (23.9)
	1-5yrs	37 (55.2)
	6-10yrs	12 (17.9)
	>10yrs	2 (3.0)
	Total	**67 (100.0)**
Duration of dialysis	3-6months	9 (13.4)
	6months-1yr	17 (25.4)
	2-5yrs	30 (44.8)
	6-10yrs	7 (10.4)
	>10yrs	2 (3.0)
	Total	**67 (100.0)**
Presence of fistula	No	5 (7.5)
	Yes	62 (92.5)
	Total	**67 (100.0)**

Table 1b: Socio-demographic and Clinical Characteristics of Study Participants

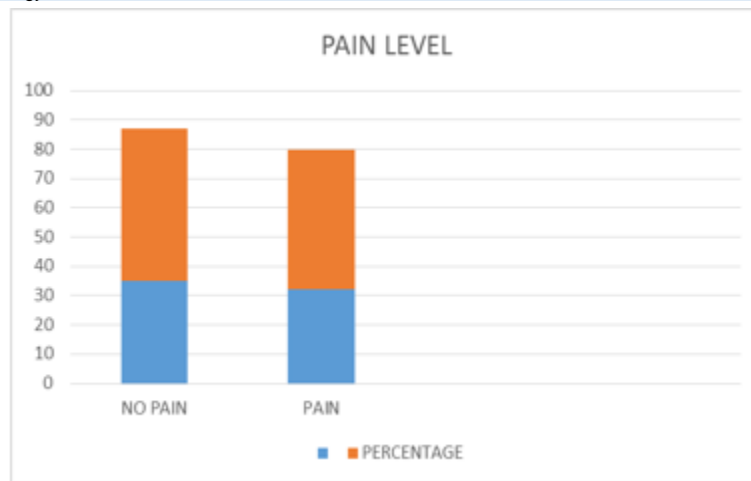Most (52.2%) of the participants reported that they did not feel pain (Figure 1).

Figure 1: Presence of Pain in Study Participants

The mean pain (±SD) pain level of the 67 participants at the hemodialysis center was 3.02 ± 3.33 (range: 0-9).
The study revealed that the prevalence of depression among the participants was 47.7%; with the majority (20.9%) of them having moderate depression. More than half (35.8%) of them had mild mood disturbances as measured by the Beck's Depression Inventory (Table 3).

Depression levels	N(%)
Normal	12(17.9)
Mild mood disturbances	23(34.3)
Borderline clinical depression	11(16.4)
Moderate	14(20.9)
Severe depression	7(10.4)
Total	67(99.9)

Table 2: Depression Levels among Study Participants

The results showed that the factors such as gender, age, education level, occupation, income level, marital status, family structure, role of patient in family, quality of care delivered, pain felt by patients and level of pain were significantly associated (P<0.05) with depression among study participants (Tables 4 and 5). However, factors such as duration of disease and dialysis, smoking, alcohol consumption and drug intake among others were not significantly associated (p >0.05) with depression among the study participants (Table 6)

Variables		Depressed	Not depressed	X^2	Df	Pvalue
Gender	Male	16	27	5.357	1	0.021
	Female	16	8			
Age	>60	2	11	10.479	3	0.015
	<40	11	5			
	40.60	19	19			
Education	Primary	11	7	22.720	2	0.025
	Secondary	12	12			
	Tertiary	9	16			
Marital status	Married	15	28	7.979	1	0.005
	Single	17	7			

Table 3: Factors Significantly Associated with Depression Among Study Participants

Variables		Depressed	Not depressed	X^2	Df	Pvalue
Role of patient in family	Child	7	2	9.744	2	0.008
	Father	11	25			
	Mother	14	8			
Family structure	Monogamy	12	27	11.102	3	0.011
	Polygamy	3	1			
	Single parent	10	15			
Occupation	Employed	2	9	13.908	3	0.003
	Retired	1	9			
	Self employed	11	6			
	Unemployed	18	11			
Income level	<50,000	20	11	9.997	4	0.040

	50,000-100,000 >100,000	8 4	10 14			
Quality of care	Good Poor Very good	18 13 1	24 4 7	10.008	2	0.007
Pain felt	Yes No	22 10	10 25	12.795	3	0.005
Pain level	0-4 5-6 >7	9 10 12	29 3 2	26.815	6	0.000

Table 4: Factors Significantly Associated with Depression among Study Participants

Variables	X^2	df	P value
Duration disease	8.918	5	0.112
Duration of dialysis	8.243	8	0.410
Presence of fistula	0.130	1	0.718
Smoking	2.128	2	0.345
Alcohol consumption	1.118	2	0.572
Drug intake	0.262	1	0.609
Presence of other diseases	0.287	2	0.866
Attitudes of healthcare providers	5.458	3	0.141
Availability of support system	8.091	7	0.325
Town of residence	3.782	5	0.733
Religion	7.367	6	0.228

Table 5: Factors Not Significantly Associated with Depression among Study Participants

Discussion

This study aimed to determine the prevalence of depression among patients undergoing hemodialysis in the Buea Regional Hospital. It is worth stating that hemodialysis patients are under considerable physical and mental stress [20]. Among end stage renal disease (ESRD) patients on hemodialysis, depression is one of the most common psychiatric disorders with higher prevalence than in the normal population [21]. Thus, this was conducted to identify risk factors that predispose hemodialysis patients to depression. This may lead to the implementation of measures to control these factors and in turn reduce the prevalence of depression among patients undergoing hemodialysis in the Buea Regional Hospital in particular and Cameroon as a whole.

The study revealed that the prevalence of depression among patients who were undergoing hemodialysis in the Buea Regional Hospital was 47.7%. Comparable estimates of depression (46.0%) were revealed in another study by Song et al. [14]. Our prevalence is slightly greater than that of the findings of Khan et al. [3] who found 43.6% in their study conducted in the Jazan Region, Saudi Arabia using BDI. In addition, the prevalence of 47.7% is more than twice that (22.8%) reported in a study by Yan et al. [22] who conducted a meta-analysis of 249 studies using the clinician interview (SCID or Diagnostic interview). Again, the prevalence of 47.7% from our study is higher than that (39.3%) of a similar study of meta-analysis which also used BDI and HAD. The differences in the prevalence of depression in the different studies could be due to different methods of assessment used to estimate depression [23] and different assessment tools used to screen for depression. However, differences in the estimate of depression when similar assessment tools were used could be due to overlapping symptoms of uremia and depression among the patients and also differences in their socio-demographic and clinical characteristics.

According to the results of this study majority of the study participants were males. This indicates that male gender is more prone to having kidney disease. This could be attributed to the fact that, men in our study setting are more exposed to the risk factors of kidney disease. These include drinking, smoking, having other diseases (such as diabetes and hypertension) as men being the head of their family, undergo more life stresses than women. However, the same rates of depression were observed among males (50%)

and females (50%) study participants. This finding is in line with that of Khan et al. where comparable rates of depression were observed among female (86.3%) and male participants (83.9%) on hemodialysis [3]. This could be related to the fact that all study participants had kidney disease. As such, they were all expected to have faced similar challenges in line with changes in their social life as they manage overlapping symptoms of uremia due to the kidney disease.

This study revealed that more than half (56.7%) of the study participants were between the ages 40-60 years. This could be attributed to the fact that the risk of having kidney disease increases with the presence of chronic diseases (such as diabetes and hypertension) which both increase with age [24]. Also, it could be because more hemodialysis patients are found in the older population [6]. In studying the socio-demographic, economic and clinical characteristics of the study participants, we found that gender, age, level of education, employment status, income level, marital status, family structure, quality of health care services, pain and level of the pain felt were significantly associated with depression.

Talking about the risk factors of depression, results of this study showed that lower levels of education is significantly associated with depression among hemodialysis patients. This finding is similar to that of Aghakhani et al. where authors reported that lower level of education aggravates depression condition [25]. Also, our study revealed that having other diseases is not significantly associated with depression (p>0.05). This disagrees with previous findings which states that having other diseases aggravate depression [25].

Marital status and level of education were significantly associated with depression. This finding is consistent with that reported by Othayq et al. where depression was significantly associated with marital status, education level and sleep disturbances [23]. However, our study findings showed that being unmarried was highly associated with high depression rate. This finding is contrary with that of Cengic et al. where gender and marital status were reported not to be significantly associated with depression [26]. The significant association between marital status and depression could be related to the fact that unmarried individuals get less social and financial support from their families, thus they face more challenges in life.

In addition, the results of this study are consistent with that of Cengic et al. where lower levels of education and unemployment were identified to be higher risk factors of depression among hemodialysis patients [26]. This could be attributed to the fact that, problems in psychological well-being, social relationships, and general health care are more common in patients with such an overall lower socioeconomic profile. These findings are also similar to that of Yoong et al. which showed an inverse relationship between depression and socio-demographic factors [27] and that of Miech et al. where depression was reported in study participants with middle and low socioeconomic status [28].

Our study revealed that, being married is significantly associated with lower levels of depression. Similarly, in a study by Theofilou et al. higher levels of depression were reported among those who were widowed or divorced compared to those who were married [29]. Link et al. concluded that, subjects holding jobs were more likely to have depression compared to jobless participants [30].

Again, our study revealed that gender is one of the risk factors significantly associated with depression. This is consistent with the findings of a study by Hao et al. [31] where gender was identified to be a risk factor for depression. A study by Hoeksema reported that only female gender was a significant risk factor for depression [32].

Furthermore, this study revealed that majority of the study participants without depression were from monogamous family structure, while only 6% and 22.2% were respectively from polygamous and single parent family structures. This could be attributed to the fact that those from monogamous families experience more love, care and support from both parents compared to those in polygamous and single parent family structures.

Our study found that quality of care rendered by health care providers to the patients is significantly associated with depression, our finding agrees with that of Goh et al. [33]. They reported that shortage of nephrologists, inadequate health education on preventive measures, late referral of the patients, lack of more cost-effective alternative treatment options (peritoneal dialysis or renal transplant are significant issues contributing to patients' psychological wellbeing.

This study revealed that factors such as duration of the disease, duration of dialysis, smoking, alcohol consumption, presence of other diseases, attitudes of health care providers and availability of support system, and town of residence were not significantly associated with depression.

Our study showed that availability of support system was not significantly associated with depression among study participants. This is contrary to Goh et al. findings which states that, inadequate insurance coverage further aggravates the problem for the patients and their family and increases psychological consequences like depression [33]. Similarly, Twk et al. reported that, supportive and peaceful family environment, happy married life and family support is associated with depression free and better quality of life in chronic HD patients [34]. This difference in the results could be due to differences in the settings where the studies were conducted and characteristics such as age of the participants since all participants in this current study were adults.

Findings from our study showed that smoking was not significantly associated with depression. Pasco et al found that among 140 non-smokers, 85.7% of patients had depression [35] while Østhus et al. reported that more than half of smokers undergoing dialysis therapy were having depression [36]. According to Egede et al. many epidemiological studies have shown that reciprocal relationship exists between smoking and depression among dialysis patients [37].

Conclusion

This study revealed that the prevalence of depression amongst hemodialysis patients attending renal clinic at the Buea Regional Hospital was high. The high prevalence of depression in this population is significantly associated with (p<0.05) with prominent risk factors such as gender, age, level of education, employment status, income level, marital status, family structure, role of patients in family, quality of care and level of pain felt by participants. Based on the findings of this study, it can be seen that there is need for health care providers working directly with hemodialysis patients especially nurses to consider the psychological aspects of patients' care at each point in time. In addition, health care providers working with hemodialysis patients should identify risk factors for depression and screen patients for depression each time they visit the renal clinic so as to ensure timely measures for prevention and management of depression.

Limitations

The study was conducted in only one of the three hemodialysis centers hence, results obtained may not reflect the actual situation in the country. In addition, study was not carried out for a long period and the follow-up time for the patients was short. Furthermore, the Buea Regional Hospital is the only hospital in the South West Region offering dialysis services as such patients coming out of Buea may have developed some depression symptoms during their stay in Buea for dialysis and might be screened for depression even though the depression could have been due to their stay out of their homes.

Acknowledgements

Authors' Contribution

All authors participated in all steps of the study from its commencement to writing. That is, conception and design, acquisition of data, analysis and interpretation of data as well as drafting and or revising and approving the final manuscript.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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