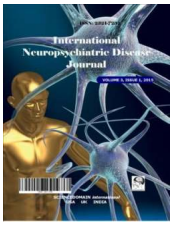

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Depression and Disability in Chronic Kidney Disease in Nigeria: A Case-Control Study

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Authors' contributions

This work was carried out in collaboration between both authors. Authors JA and VOL designed the study and wrote the protocol. Author VOL performed the statistical analysis, managed the literature search and wrote the first draft of the manuscript with assistance from author JA. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: The main purpose of this study was to determine the prevalence of depression and disability in Chronic Kidney Disease (CKD) patients and to determine any association between stage of CKD and depression in the University College Hospital, Ibadan.
Methods: One hundred and sixty CKD patients were matched by age and gender with 160 subjects from the General Outpatient Department (GOPD). CKD patients were staged according to the study center criteria.
The Mini International Neuropsychiatry Interview was used to elicit the diagnosis of depression, and the WHODAS 2.0 to assess disability. The Mann-Whitney U test and the independent t test/ANOVA to compare median and mean WHODAS scores respectively, the Chi square statistics were used in comparing WHODAS scores between the CKD group and the control group and the Wilcoxon test for within group comparisons. All analyses were carried out using (SPSS version 16.0).
Results: Prevalence of depression was 17.5% in CKD and 4.4% in control group. There was no significant difference between stages of CKD and depression. Predictors of disability were stages 3

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and 4 of CKD OR = 1.9, 95% CI (1-3-3.0), *P* = .001 and depression OR = 8.5, 95% CI (1.8-38.5), *P* < .01, after model adjustment.
Conclusion: There is a need for effective consultation liaison work in the general medical department in order to assist in early detection and treatment of patients with depression in CKD.

Keywords: Depression; disability; chronic kidney disease; stages of chronic kidney disease; rehabilitation.

1. INTRODUCTION

The estimated incidence of Chronic Kidney Diseases (CKD) is about 400 per million in Nigeria [1]. It is also estimated that approximately 25% of individuals with CKD suffer from depression, especially at the end stage [2,3], which is often unrecognized and usually goes untreated [4], despite evidence that treatment of depression improves the survival rate [5].

Because depression and CKD share similar symptoms such as easy fatigability, poor sleep and appetite [6], there are often diagnostic challenges when they both coexist thereby leading to increased disability [7]. Depression was reported to be a risk factor for mortality in patients on long term dialysis [8].

There are several plausible factors responsible for this high rate of comorbidity. For example, there are reports that both depression and CKD share a common biological pathway in terms of presence of inflammatory cytokines, dis-regulation of the Hypothalamo-Pituatary Adrenal (HPA) axis, and oxidative stress [9]. Depression could also be a psychological reaction to CKD [10]. Economically, cost of treatment of CKD poses a huge financial burden to its suffers and their family members [11]. This is because of cost of dialysis, organ transplantation and medications.

The prevalence rate of depression among patients on maintenance dialysis is higher than in the general population and is estimated to be between 20-30% [3,12,13]. In a much earlier study, the prevalence of depression was found to be over 60% in patients with End - Stage Renal Disease [14], and was associated with high unemployment rate [3].

In an earlier study in Nigeria, 35% of a sample of patients who were on haemodialysis for CKD met the diagnosis of depression [15]. However, in a more recent cross - sectional study in Lagos, a prevalence of depression of 23.7% was found in patients with CKD compared to 2% in a healthy control group [16].

In Nigeria, south of the Sahara, the situation could be gloomier based on poor national health profile and lack of medical insurances. These factors make the majority of clients seeking medical intervention to pay out of pocket. Although a number of studies have been carried out on depression in CKD, both outside and within Nigeria, to the best of our knowledge, none of them have compared the outcome of these two conditions. Thus, as advancement on previous studies, our main objectives were to determine the prevalence of depression and disability in patients with Chronic Kidney Disease (CKD) attending the renal clinic at the University College Hospital and to determine the association between stage of CKD and depression.

2. MATERIALS AND METHODS

2.1 Study Design and Location

In this comparative study, 160 consecutive patients with chronic kidney disease utilizing the Nephrology unit of the medical out-patient (MOP) department were matched with 160 patients with simple ailments attending the general outpatient department (GOPD) both in the University College Hospital (UCH) Ibadan, Nigeria.

2.2 Location of the Study

The study was carried out in Ibadan, the capital of Oyo State in Nigeria, a city with a population of about 3.5 million people [17].

The Nephrology unit of the medical department of UCH has facilities for Renal Replacement Therapy (RRT) including renal dialysis and it closely liaises with the renal transplant center of the hospital.

The GOPD is run by the family medicine department of the hospital. It serves as a

gateway for patients' entry into the hospital from where patients are referred to various specialized departments. Patients above 60yrs of age were recruited from the geriatric unit of the GOPD.

2.3 Sample Size Determination

The sample size for this study was calculated using the formula for two independent samples [18].

The prevalence of depression in both the index and comparison groups was used for the calculation.

$N = [2(Z1\alpha /2 + Z1\beta)^2] /ES$

$Z1\alpha /2$ = Standard normal deviation corresponding to 95% confidence level at 1.96.

$Z1\beta$ = Statistical power at 0.84

$ES = P1 – P2/\sqrt{[P (1-P)]}$

N = sample size for each group to be studied.

P1 = prevalence of depression in the index population (CKD) based on a previous study in Nigeria (23.7%) [16].

P2 = prevalence of depression in the control group, (patients attending GOP clinic for simple ailments). This can approximate to the general population (8-12%) [19]. 10% was used in this study.

N = 128

The minimum sample size for each population was 128.

We anticipated a non response rate of 80% [20]; therefore, the final sample size was calculated as follows: 128/0.8 = 160.

Out of the initial recruited 180 patients with CKD, 20 patients were not able to take part in the study for reasons including severity of illness, high disease burden (2 or more severe general medications) and refusal to give consent. Thus 160 patients with CKD were finally recruited for the study.

2.4 Sampling Method / Procedure

Total sampling method was used to collect data for the patients with CKD. In this case, the patients had already been diagnosed with CKD by a specialist Nephrologist.

We had earlier on before study commencement obtained information from the medical record department and patients' case notes about patient inflow. This reveals that about 200 patients with CKD are attended to in a year period. This group constituted our sampling frame.

2.5 Inclusion Criteria

- Patients between ages of 18 and 80 years.
- Diagnosis of chronic kidney disease by a nephrologist corroborated by laboratory investigations: Glomerular Filtration Rate (GFR) < 60 mls/min/1.75 m^2;
- Evidence of kidney damage; Urine Albumin = 1+
- Serum creatinine > 1.5 mg/dl
- Absence of an additional severe general medical condition.

2.6 Exclusion Criteria

- Refusal to give consent.
- Presence of any DSM IV axis I disorder.
- Presence of any additional severe general medical condition.
- Inability to participate because of severity of illness.

Patients who met the inclusion criteria were recruited into the study after explaining the purpose and nature of the study to them. Consenting participants were allotted tallies for the purpose of identification. They were thereafter interviewed privately in another room after being attended by their primary physicians.

The staging method that was adopted in this study is based on the Kidney Disease Outcome Quality Initiative (KDOQI) (National Kidney Foundation-K/DOQI, 2002). The Davita GFR calculator was used to calculate the GFR. The equation makes use of the Modification of Diet in Renal Disease Study 4 (MDRD4) reviewed equation. The equation is a modification from the original MDRD study [21]. It is calculated on the basis of patients' age, gender, and race and the current serum creatinine level.

2.7 Data Collection

This was by the use of questionnaires and included;

2.7.1 Sociodemographic questionnaire

This was designed by the investigators to elicit information on socio- demographic characteristics of the participants. These included patients' age, sex, and marital status, highest level of education, employment status, religion, ethnicity and previous history of mental illness. Information on the age at onset of illness was obtained to calculate the duration of illness as well as the most recent creatinine result for calculating the Glomerular Filtration Rate and staging of the disease. The current treatment modality was also included in this questionnaire.

2.7.2 The Mini International Neuropsychiatry Interview (MINI)

Depression was assessed using the MINI International Neuropsychiatry Interview (MINI). The MINI was designed as a brief structured interview for the major Axis I disorders in DSM-IV and ICD10 [22,23]. The MINI is a valid and reliable instrument comparable with SCID-P and CIDI and is used in generating DSM IV and ICD 10 axis I diagnosis. The MINI has been used in several studies in Nigeria among hospital patients and also in the general population. Validation and Reliability studies have been done comparing the MINI to the SCID-P for DSM-III and the CIDI. The result shows that the MINI has acceptably high validation and reliability scores. It has a shorter administration time than other referenced instruments. It can be used by clinicians and other trained lay interviewers. The MINI is divided into modules identified by letters, each corresponding to a diagnostic category. At the end of each module, diagnostic boxes permit the interviewer to indicate whether diagnostic criteria are met. For the purpose of this study, module A was used since the diagnosis of interest is depression. This module assesses patients for Major Depressive Episode (current and recurrent episodes).

2.7.3 World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0)

In this study, the 12 item version was used. This instrument has been used in several studies in Nigeria including a recent comparative analysis of disability in individuals with bipolar affective disorder and schizophrenia in a Sub-Saharan African mental health hospital [24].

Each question of the WHO-DAS 2.0 is usually rated from 1 to 5. No difficulty (1), mild difficulty (2), moderate difficulty (3), severe difficulty (4), extreme difficulty (5).

Scoring: The simple scoring method was used in this study where scores ranging from 1 to 5 were assigned to each item and computed by simple addition. The sum of the items in each domain was used in describing the degree of functional disability.

2.8 Administration of Research Instruments

The MINI was administered by trained psychiatry resident doctors. However, other research instruments were either self-administered or interviewer administered depending on the level of literacy and willingness of the participants.

2.9 Ethical Consideration

Ethical approval for the study was obtained from the Ethics committee of the university of Ibadan and University College Hospital in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Participants were duly informed and the objectives of the study were explained to them. Informed consent was obtained from each participant before commencement of the interviews, confidentiality was also maintained. Respondents with a diagnosis of depression were appropriately referred for further assessment and treatment. Before interviews were conducted, written permission was obtained from the heads of the General Outpatient Department and Department of Medicine. In both groups, efforts were made to ensure that the research protocol did not influence the normal routine and smooth running of the clinics where the study was carried out.

2.10 Pilot Study

All instruments of data collection were pilot tested among 30 patients attending the medical outpatients department of the State Hospital Ibadan prior to the commencement of the study. This pilot study was to determine inter-rater reliability of the interviewers and also the possible administration time and clinical dilemma that could be encountered in the main study. The interviewers were found to have significant inter-rater reliability, r = 0.83-0.91.

2.11 Statistical Analysis

Summary statistics such as means, frequency tables and standard deviations were generated.

WHODAS scores were computed using hand-scoring method. In view of the distribution of the WHO-DAS scores, both and non parametric approaches were used to analyze the WHODAS scores. The median score was used as a cut -off point, and scores below median was regarded as no disability in both groups. Thus, we used the Mann-Whitney U test and the independent t test/ANOVA to compare median and mean WHODAS scores respectively. Post- hoc multiple comparisons were also carried out for exploration of significant associations after the ANOVA. The Chi square statistics were used in comparing disability scores between the CKD group and the control group, while the Wilcoxon test was used for within group comparisons. All significant Chi square results were Yates or Bonferroni corrected as appropriate. Multivariate analyses were carried out using binary logistic regression analysis. This was to determine the effects of significant confounding variables. Our dependent variable was disability in CKD and independent variables were variables that were associated with disability in CKD during univariate analysis; these were diagnosis of depression and stages of CKD.

We adjusted for age during the initial regression analysis; this is because although age was associated with disability in CKD, it is a potential confounder for disability in CKD.

All analyses were set at 95% CI, $p < 0.05$ and were carried out using (SPSS version 16.0) [25].

3. RESULTS

Results show that the two groups were well matched as there was no significant difference in the sociodemographic characteristics except in the area of religion where a higher proportion of the patients with chronic kidney diseases were Christians, $X^2 = 4.8$, $P = .03$. The mean age of all respondents was 53.32 SD (14.55) years, the median was 55 years; range was 18-80 years (Table 1).

The prevalence of depression was 28 (17.5%) among the group with chronic kidney diseases, and 7 (4.4%) among the control group, $X^2= 14.1$, $P = .001$. Median WHO score as well as the mean WHODAS score were respectively, significantly higher among the CKD group $Z = 8.5$, $P < .001$, $t = 8.8$, $P < .001$ respectively. The prevalence of depression without disability was significantly higher among the CKD group than in the control group $X^2 = 4.7$, $P = .03$. The prevalence depression with disabilities was also significantly higher on the CKD group than in the control group $X^2 = 4.5$, $P = .03$.

There was a significant difference in the WHODAS scores in CKD (Mean =24.56, SD=9.62) and the controls (Mean=16.73, SD=5.96), t = 2.6, (df) 318, $P = .01$. The median WHODAS score was also significantly higher in the CKD group than in the control group Z= 2.5, $P = .01$ (Table 2).

3.1 Profile of CKD Patients on Dialysis

Of the 160 patients with CKD, 77 (48.1%) were on dialysis. (Among those patients with CKD who were on dialysis, the prevalence of depression was 11 (14.1%), the prevalence of depression among patients with CKD (but not on dialysis) 17 (20.7%), the difference was not significant, $X^2= 0.7$, $P = .5$. There was no significant difference in the WHODAS scores in CKD on dialysis, (Mean =25.12, SD=8.21) and the controls (Mean=24.22, SD=8.03), t = 0.7, (df) 156, $P = .5$ There was also no significant difference between the median WHODAS score of CKD patients on dialysis compared with those not on dialysis, $Z = 0.6$, $P = .7$ respectively.

There was no sociodemographic correlate of depression in CKD.

We also found that a significantly higher proportion of respondents with CKD who had a disability were not in any employment compared with the control group, $P = .02$ (Table 3).

There were significant age differences in the mean disability score of the respondents, $P = .005$. The post hoc test shows that the difference was due to higher disability among respondents who were older than 64 years compared with those between 55-64 years, 45-54 years, 35-44 years, 25-34 years, and 18-25 years (Table 4).

In terms of stages of CKD, there was no significant difference between stages of kidney disease and prevalence of depression; there was also no significant association between stages of CKD and prevalence of depression with associated disability. However, there was a significant difference in the level of disability in CKD patient and stages of the CKD, $F = 5.8$, $P = .001$ (Table 5). Post hoc tests show that this difference was due to a higher mean disability score in stage 5 CKD compared with stages 1 and 2, $P = .001$ and stage 4, $P = .04$.

Table 1. Sociodemographic characteristics of the case and control groups

Age	CKD N (160)		Control N (160)		X^2	P
	n	%	n	%		
18- 25	6	3.8	6	3.8	0.5	1.0
25-34	14	8.8	15	9.4		
35-44	24	14.4	23	14.4		
45-54	35	21.9	31	19.4		
55-64	39	24.4	41	25.6		
>64	43	26.9	44	27.6		
Gender						
Male	96	60.0	86	53.8	0.2	0.2
Female	64	40.0	74	46.3		
Education						
None	8	5.0	14	8.8	4.4	0.2
Primary	31	18.4	30	18.8		
Secondary	51	31.9	37	23.1		
Post-secondary	70	30.0	79	32.5		
Marital status						
Married	109	68.1	122	76.3	2.1	0.1
Unmarried	51	31.9	38	23.8		
Occupation						
Professional	27	19.1	28	19.9	4.9	0.2
Skilled	27	19.1	42	29.8		
Unskilled	47	33.3	40	28.4		
Unemployed	40	28.4	31	22.0		
Religion						
Islam	50	31.3	69	43.1	4.8	0.03
Christianity	110	68.8	91	56.9		
Ethnicity						
Yoruba	140	87.5	143	89.4	1.4	0.5
Igbo	12	7.5	8	5.0		
Hausa	2	1.3	-	-		
Others*	6	3.8	9	5.6		

Table 2. Prevalence of depression and disability among respondents

Clinical description	CKD N (160)		Control N (160)		X^2	P
	N	%	n	%		
Depression						
Yes	28	17.5	7	4.4	14.1	< 0.001
No	132	72.5	153	95.6		
Disability without depression						
Yes (Scored ≥ Median)	108	67.5	38	23.8	60.0	< 0.001
No (Scored < Median)	52	32.5	122	76.2		
Median WHODAS	10^W		2		8.5^Z	< 0.001
Disability in depression						
Yes (Scored ≥ Median)	14	8.8	5	3.1	4.5	0.03
No (Scored <Median)	146	91.2	155	96.9		
Median WHODAS	21^W		9		2.5^Z	0.01
WHODAS Mean (SD)	24.56	(9.62)	16.73	(9.56)	2.6^t	0.01

Median WHODAS disability in depression vs Median WHODAS disability without depression were compared using wilcoxon signed rank test = 10.6, p = 0.01; z; Wilcoxon signed rank test; t:independent t test

Table 3. Sociodemographic correlates of disability

	CKD N=108	Control N=38	X^2	P
	(n) %	(n) %		
Age				
18- 25	4(3.7)	1(2.6)	6.19	0.4
25-34	11(10.2)	6(15.8)		
35-44	17(15.7)	8(21.1)		
45-54	17(15.7)	7(18.4)		
55-64	29(26.9)	6(13.2)		
65-74	30(27.8)	10(26.4)		
75-80				
Gender				
Male	70(64.8)	18(47.4)	3.57	0.1
Female	38(35.2)	20(52.6)		
Education				
None	6(5.6)	6(15.8)	11.3	0.05
Primary	23(21.3)	4(10.5)		
Secondary	35(32.4)	6(15.8)		
Post Secondary	44(40.8)	22(57.8)		
Marital status				
Married	74(68.5)	30(78.9)	1.49	0.2
Unmarried	34(31.5)	8(21.1)		
In employment				
Yes	47(43.5)	25(65.8)	5.6	0.02
No	61(56.5)	13(34.2)		
Religion				
Islam	34(31.5)	18(47.5)	3.09	0.08
Christianity	74(68.5)	20(52.6)		
Ethnicity				
Yoruba	96(88.9)	33(86.8)	1.07	0.8
Igbo	7(6.5)	4(10.5)		
Hausa	1(0.9)	-		
Others*	4(3.7)	1(2.6)		

Predictors of disability were stages 3 and 4 of CKD OR = 1.9, 95% CI (1-3-3.0), *P* = .001 and depression OR = 8.5, 95% CI (1.8-38.5), *P* < .01 (Table 6).

4. DISCUSSION

This study aimed at assessing the prevalence of depression among patients with chronic kidney disease and its association with disabilities compared to patients in a walk in in clinic, a general outpatient clinic. The result indicates that the prevalence of depression was higher among patients with CKD and except for religion, has no other sociodemographic correlate. Disability was significantly associated with stages of CKD and disability, but depression was not significantly associated with stages of CKD. The discussion of these results will be based on previous literature on the subject matter and is presented therein.

4.1 Sociodemographic Characteristics

About two-thirds of the respondents with CKD were men. This is not unexpected, given research evidences that CKD is one and a half times more commoner in men, a ratio that is higher after 70 years of age, despite the greater longevity of women [26], although Stack in his study within the Health system of the Irish population found that women were more likely to have chronic kidney disease [27]. It has been noted that men are more likely to have CKD because many of the cardiovascular and metabolic risk factors for CKD are commoner among them [28]. Men are also more likely to have risky lifestyle such as smoking [29] and drinking [30] which are both identified risk factors for CKD.

Table 4. Association between stages of kidney disease, depression and disability N = 160

Depression/disability	Stage of CKD					X^2	p
	1	2	3	4	5		
	n (%)	n (%)	n (%)	n (%)	n (%)		
Depression							
Yes (28)	-	1 (33.3)	5 (16.1)	8 (13.1)	14 (21.9)	2.4	0.7
No (132)	1 (100.0)	2 (66.7)	26 (83.9)	53 (86.9)	50 (78.1)		
Disability							
Yes (108)	-	2 (66.7)	16 (51.6)	37 (60.7)	53 (82.8)	13.9	$< 0.01^{BS}$
No (52)	1 (100.0)	1 (33.3)	15 (48.4)	24 (39.3)	11 (17.2)		
Depression + disability							
Yes (26)	-	1 (33.3)	5 (15.1)	6 (9.8)	14 (21.9)	4.0	0.3
No (134)	1 (100.0)	2 (66.7)	26 (85.9)	55 (90.2)	50 (78.1)		

Table 5. Relationship between stages of kidney disease, depression and disability

Stage	Depression				X^2	P	Depression+ disability	F	p	Disability	F	p
	Yes		No				WHODAS Mean (SD)			WHODAS Mean (SD)		
	n	%	n	%								
1	-	-	1	100.0	2.4	0.66	-			-		
2	1	33.3	2	66.7			34.00	0.5	0.8	21.80 (7.93)	5.8	0.001
3	5	16.1	26	83.9			31.40 (8.85)			22.61 (10.84)		
4	8	13.1	53	86.9			32.88 (10.95)			24.00 (9.53)		
5	14	21.9	50	78.1			35.00 (9.30)			28.30 (9.50)		

Table 6. Predictors of disability among respondents

Prediction 70.6%	B	S.E.	Wald	Sig.	Exp(B)	95.0% C.I.	
	Lower	Upper	Lower		Upper	Lower	Upper
Stage of CKD							
Stages 1&2 (Ref)					1		
Stages 3to5	.689	.212	10.542	.001	**1.992**	**1.314**	**3.020**
Depression							
No (Ref)					1		
Yes	2.134	.774	7.599	.006	**8.447**	**1.853**	**38.507**
Constant	-4.580	1.290	12.604	.000	.010		

Variable(s) entered on Stages of CKD, Depression

We also observed a preponderance of Christians in both groups. This trend has been observed in some recent studies in Ibadan [31]. Although religion was not included as part of data in the national census of 2006, the rapid increase in the establishment of churches, coupled with the expectations of people who are chronically ill seeking miraculous healing could lead to late presentation in the hospital for diseases such as CKD. This may explain the preponderance of Christians in the study.

4.2 Prevalence of Depression

We found that depression was present in about 1 of every 5 patients with CKD and was 4 times more prevalent among patients with CKD than among attendees of GOPD. This finding is in support of previous studies. For example, a study in Lagos, found depression to be present in about 1 in every 4 patients with CKD and to be 10 times commoner than their control group [16]. In a review of literature, Palmer found that approximately one – quarter of adults with CKD have depression [32]. The disparity in the prevalence rate could be as a result of differences in the instrument employed in diagnosing depression and differences in the sample population.

Kimmel has indicated that the prevalence of depression varies with the studied population, the provided treatment modality and the employed diagnostic tool in assessing for depression [33]. For example, in the current study, less than half of the studied sample was on haaemodialysis; and we found that depression was not significantly more prevalent among them when compared with those who were not on haemodialysis. This is contrary to the reports from some previous studies [10,12,13]. Although Tong and colleagues found that depression was more prevalent in patients on dialysis, Lowry and Atcherson found that depressive symptoms remitted in CKD patients during home dialysis training [34]. The clinical import of the high prevalence of depression in CKD lies in its consequences. These include high costs of medical treatment, amplification of both psychiatric and physical symptoms. Patients with depression in CKD are also more likely to have problems of self – management / self monitoring and adherence to medical treatment.

We also found that 4.4% of patients in the control group had depression. A similar figure was obtained by Wittchen and colleagues in primary care [35]. However, higher rates of 10% or higher have been reported in other studies [36]. The lifetime prevalence of depression varies widely from 3% to 16.9% [23], thus the prevalence of depression obtained in the current study among attendees of the GOPD is within range. An important factor responsible for the low

prevalence of depression in our sample is the way depression is perceived in the Nigerian culture, leading to concealment of symptoms of depression [37].

4.3 Disability in Chronic Kidney Disease

We found that disability was greater among patients with CKD as compared with the control group, and was significantly associated with the stage of the kidney disease. We also found that disability in CKD was higher among patients on dialysis. These findings are in support of those of Intiso in Italy who found a functional limitation and severe disability in CKD patients [38]. Similar to the current report, Intiso found that the disability in CKD was more severe in patients receiving haemodialysis. The higher level of disability in patients on dialysis has been attributed to considerably lower exercise tolerance, functional capacity, and more muscle wasting when compared with healthy subjects or patients with less severe CKD. The functional limitation in CKD could also be adduced to the manifestations of CKD such as anaemia, bone mineral metabolism, and uraemia [39]. This may account for significantly fewer numbers of respondents with CKD who had a disability that were in employment, as reported in this study.

4.4 Disability in Comorbid Chronic Kidney Disease and Depression

We also found that subjects who had comorbid depression and CKD reported more disability than those who had CKD without depression. This suggests that depression on its own is highly disabling [40], and it is a significant contributory factor to disability when it is associated with CKD. In some previous work, although a major depressive episode has been found to be associated with almost a twofold higher risk of dialysis initiation, and hospitalization [41], our findings have not replicated this, as there was no significant difference in the prevalence of depression and level of disability in the dialysis group versus the non-dialysis group. This by implication suggests that the mechanism underlying depression in CKD could have commenced operating prior to the establishment of the diagnosis of CKD and perhaps while the patient was still brooding over the cause of the CKD.

Thus, our findings from this study underscore the clinical significance of screening for depression in CKD because it is an independent risk factor for disability [42].

Unfortunately, depression is poorly recognized and or poorly treated by most general physicians [4]. This is very relevant considering the huge public health burden of suicide from depression, especially in a society like Nigeria where there is no suicide prevention programs and where access to mental health service is poor [43].

4.5 Stages of Chronic Kidney Disease and Depression

Consistent with the results of a similar work by Hedayati and colleagues, [3] we found no association between the stages of CKD and prevalence of depression. However, a more recent study in 2011 reported an increase in the prevalence of depression with advancing stage of CKD [16]. The lack of association between stage of CKD and depression as reported in the current study appears paradoxical, given research findings that the prevalence of depression is directly associated with stages of CKD [14]. Our findings could suggest the role of psychological factors in the aetiology of depression in CKD irrespective of the stage of the CKD [44]. This is not unexpected in the Nigerian context, given lack of adequate health education on the course of the CKD.

Although there is a number of plausible mechanisms for the association between CKD and depression such as non-adherence to medical instructions, including diet and fluid intake [45], its adherence to medical instructions could only be optimal if coping style is consistent with the demands of the illness [44]. Such poor attitude to the CKD is consequently associated with decreased survival [46] (Kimmel et al. 1998). The results of the multivariate analysis indicate that respondents in stages 3 and 4 of CKD and depression were independent predictors of disability but that depression has higher odds.

Though the present study has strengthened previous ones reporting that disability in CKD is directly associated with the stage of the disease [38], it has recognized depression as a stronger factor that predicted disability in CKD. Thus, as previously noted, identifying and treating depression has the potential of modifying complications, prognosis and risk of mortality in individual with CKD [14]. On the other hand,

disability itself has been recognized as a predictor of depression [47].

4.6 Implication for Rehabilitation

This current study however has implications for rehabilitation for patients with CKD/ depression, moreover depression was associated with CKD irrespective of its stage. Exercise and physical conditioning programs have been reported to have the potential benefits of improving the physical health, [48], psychosocial function [49] in patients with CKD and also in depression [50]. Exercise has been found to bring about remission even as a first line method of treatment in patients with mild and moderate depression and almost equals antidepressant medications in terms of efficacy. When used as an adjunctive method of treatment to anti-depressants, the efficacy increases.

The development of short screening tools capable of assessing physical activity [51] and a 2 –item patients' health questionnaire capable of screening for depression [52] could be incorporated into the clinical care of patients with CKD. This has the advantage of being the first step in the evaluation and rehabilitation of patients who have disabilities from CKD and who also have depression.

The current study has a number of limitations; the present study did not take into account the possible causes of CKD among the population with the disease. This could be potential confounders of depression or disability in CKD. The physical status of the patients could have affected the understanding of the symptomatologies of depression and hence its prevalence. The diagnosis of depression did not take into account the reports of caregiver and family members; this could have helped in raising suspicion, especially for patients who might want to downplay symptoms for stigma and other reasons.

Also, because the process of the interview was none - blinded, the study could have introduced bias in the symptom ratings in the two groups and this could have accounted for a relatively low prevalence of depression in the control group. We also did not analyze the effect or effects of the particular treatment modality of the respondents with CKD. Several studies have considered factors in hemodialysis as contributing a great deal to the emergence of depression among patients with CKD. Also, this is a cross sectional study, our sample has been drawn from a single region in the country, and the sample size is not large enough to strengthen a number of our inferences, Thus, the interpretation of the findings should be with caution.

5. CONCLUSION

In conclusion, depression is highly prevalent in CKD, although there was no significant difference between stages of CKD and prevalence of depression. There was also no significant difference in the prevalence of depression in patients on dialysis compared with those not on dialysis, neither was there a significant difference in the level of disability between patients on dialysis compared with those not on dialysis.

Key points

- Depression is highly prevalent among patients with chronic kidney disease.
- Depression is a strong predictor of disability from chronic kidney disease.
- Depression in chronic kidney disease is not related to the stage of the chronic kidney disease.
- Disability in chronic kidney disease is related to the stage of the chronic kidney disease.

DISCLAIMER

This manuscript was presented in the conference.

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23rd World Congress on Psychosomatic Medicine,
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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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