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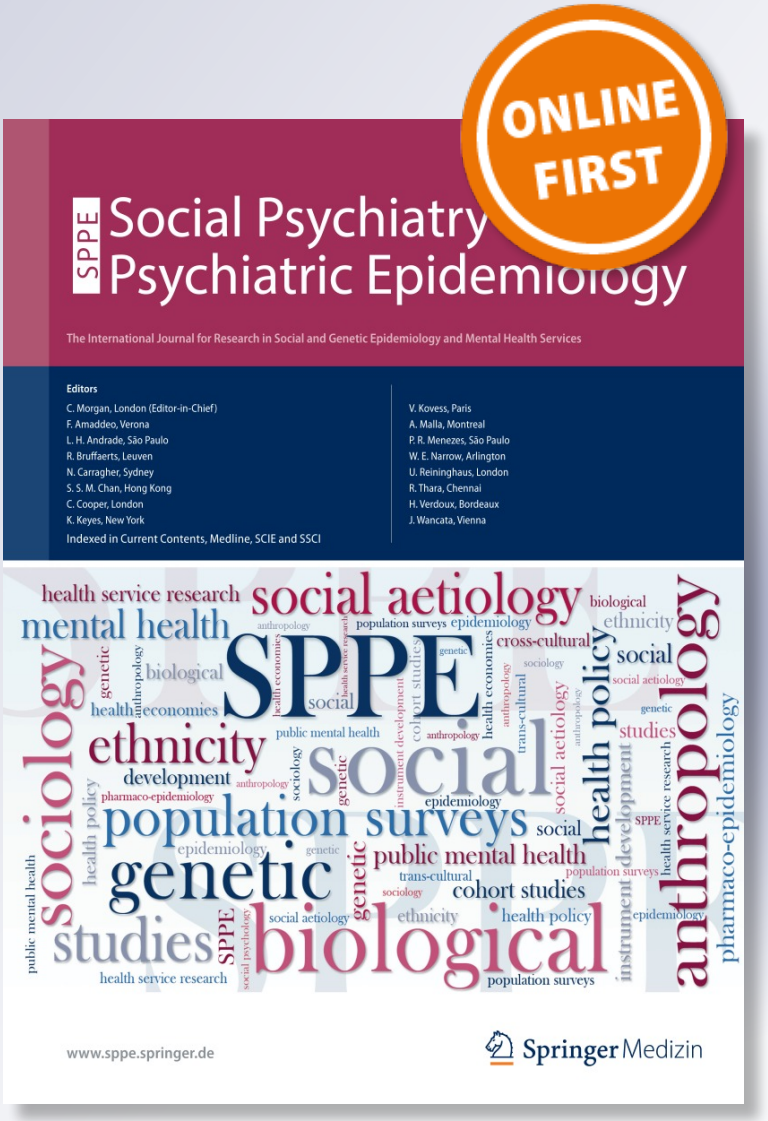

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ORIGINAL PAPER

Relationship between depressive symptoms and quality of life in Nigerian patients with schizophrenia

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Abstract
Purpose Quality of life (QOL) in patients with schizophrenia is influenced by various factors such as depressive symptoms. This study assessed the relationship between depressive symptoms and QOL in outpatients with schizophrenia in Nigeria and evaluated the associated socio-demographic and clinical factors.
Methods One hundred patients with 10th edition of the International Classification of Diseases diagnosis of schizophrenia participated in this study. Socio-demographic and clinical factors such as depression were assessed with Zung Self-rating Depression Scale and symptoms of schizophrenia with the Positive and Negative Syndrome Scale of schizophrenia (PANSS). The level of functioning was assessed with the Global Assessment of Functioning Scale. QOL was assessed using the brief version of the World Health Organisation Quality of Life Scale.
Results There were 27 (27.0 %) patients with depression. The depressed patients reported significant lower scores in all QOL domains when compared with the non-depressed group. All QOL domains were significantly negatively correlated with the total PANSS and all its subscales (except for psychological domain with total PANSS and social relationship and environmental domains with PANSS positive). Severity of depressive symptoms was significantly negatively correlated with all QOL domains. Functioning was significantly positively correlated with all QOL domains except in the environmental domain. Multiple regression analysis showed that depressive symptoms predicted all QOL domains except the social relationship domain while negative symptoms predicted social relationship and environmental domains.
Conclusion Depression is a common occurrence during the course of schizophrenia. Depressive and negative symptoms have a significant impact on the QOL of patients with schizophrenia.

Keywords Quality of life · Depression · Schizophrenia · Nigeria

Background

Schizophrenia is a mental disorder that inflicts severe hardships on patients and their families. In the past, the control of patients' symptoms was regarded as the primary goal of treatment in schizophrenia. However, recently improving patient's quality of life (QOL) is now considered an increasingly important objective of treatment [1]. Factors reported by researchers to influence the QOL of patients with schizophrenia are life events, treatments, cognitive deficits and affective symptoms [2–4].

Depressive symptoms have been noted to be associated with impairment in everyday functioning [5], poorer QOL [6, 7] and greater need for medication and hospitalization [8] in patients with schizophrenia. Studies have reported negative correlations between depression and subjective QOL [6, 9, 10]. Furthermore, depressive symptoms have been reported to increase mortality rates of patients with schizophrenia by contributing to their alarmingly high rates of suicide [11]. Depressive symptoms further worsen any already existing deficit state, i.e. negative symptoms [12]. Therefore, it becomes important and essential to clearly

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delineate depressive symptoms from deficit states and manage them appropriately to improve the clinical outcome of patients with schizophrenia.

Antipsychotic medications are very important in the management of symptomatology in schizophrenia [13]. Some researchers suggest that depressive symptoms may be part of the schizophrenic syndrome when the full-blown psychosis is most evident and this is known as "revealed depression" [14]. It has been reported that clinical improvement of depressive symptoms correlates significantly with the severity of psychotic symptoms and its improvement in schizophrenia [15, 16]. In addition, treatment of psychotic symptoms with antipsychotics has been shown to improve depressive symptoms that occur during the acute psychotic phase of schizophrenia [17]. However, depressive symptoms occurring during the stable phase of schizophrenia may still require a specific treatment such as the use of antidepressant [18].

Schizophrenia varies in many ways across the world with different cultures and races displaying markedly different symptoms and manifestations [19]. Studies conducted in the developed countries have reported the relationships of depression on subjective QOL among patients with schizophrenia [4, 6, 12]. The available studies in the developing countries indicated that subjective QOL in patients with schizophrenia is poor and found little or no relationship with socio-demographic and clinical variables [20, 21]. However, a recent study demonstrated an association of poor subjective QOL with anxiety and depressive symptoms, unemployment, co-morbid medical problems and poor social support in Nigerian schizophrenia patients. However, depression and anxiety were not formally assessed using a standardised instrument [1]. Therefore, studying the relationship between depressive symptoms and QOL would not only provide information for cross-cultural comparison but also be useful in the development of treatment strategies that would improve the QOL of patients with schizophrenia. The aim of this study was to assess the relationship between depressive symptoms and subjective QOL in outpatients with schizophrenia in Nigeria and to evaluate the associated socio-demographic and clinical factors.

Methods

Subjects

This was a cross-sectional study carried out in the outpatient psychiatric clinic of Wesley Guild Hospital, Ilesa, a unit of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Nigeria. Subjects aged 18 years and above fulfilling the diagnosis of schizophrenia according to 10th edition of the International Classification of Diseases (ICD-10) [22] were consecutively recruited over a period of 5 months (between May 2010 and September 2010). The patients should have been diagnosed and receiving treatment for at least 1 year. It was expected that within this period of time, the patient would have had a fair knowledge of the illness, its dynamics and its effect on their lives thereby enabling him or her to make valuable assessment of their QOL. Also, the last hospital admission should have been at least 6 months before the date of assessment. Subjects with history of significant co-morbid organic disease or mental retardation and significant physical illness such as severe hypertension and diabetes mellitus were excluded from the study.

Procedure

The study protocol was approved by Ethics and Research Committee of the OAUTHC.

During the study period, a total of 152 patients were identified to have been previously diagnosed with schizophrenia. Of these, 50 patients were excluded from the study (among whom 34 patients had duration of illness of less than a year and 16 patients had duration of last hospital admission of less than 6 months). After the aim of the study and confidentiality of data were explained to each of the remaining patients, two patients refused to participate. Thus, a total of 100 patients agreed to participate in this study.

Assessments

The patients with schizophrenia were assessed clinically with the Mini International Neuropsychiatric Interview (MINI), English Version 5.0.0 [23] to confirm the diagnosis. Socio-demographic characteristics and clinical details of patients were collected with a specially designed structured questionnaire. The clinical details included age of onset, total duration of the illness, number of active symptoms of schizophrenia (relapses), number of hospital admissions due to illness, daily dose of current antipsychotic medications prescribed to each patient was converted into milligram equivalents of chlorpromazine according to conversion factors derived from literature [24, 25]. A total chlorpromazine equivalents were calculated from the total daily dose of each antipsychotic listed in the patient's case file. Then each converted antipsychotic-specific chlorpromazine equivalents were added to arrive at a total dose. The use of other medications was also assessed.

Psychopathology was assessed with the Positive and Negative Syndrome Scale (PANSS) [26]. The PANSS is a 30-item instrument that gives scores on positive symptoms,

negative symptoms and general psychopathology. For each item, ratings are made on a 1–7 scale of symptom severity. The severity of depressive symptoms was assessed using Zung Self-rating Depression Scale (SDS) [27]. The SDS is a 20-item self-administered questionnaire graded with a 4-point Likert Scale (never, occasionally, sometimes, mostly) for each question. The sum of scores (raw scores) for each respondent was converted to a 100-point scale which is the SDS Index Score [27] with a score of less than 50 points classified as normal, 50–59 points classified as mild depression, 60–69 points classified as moderate depression and 70 and above points classified as severe depression. The instrument and its back-translated Yoruba version has been standardised and used in Nigeria [28, 29]. The level of functioning was assessed with the Global Assessment of Functioning Scale [30]. This is an observer-rated single rating on a 100 point scale, where 100 indicate not only the absence of pathology but also positive mental health. The subjective QOL was measured using the World Health Organisation Quality of Life Scale-Brief version (WHOQOL-BREF) which is a 26-item self-administered generic questionnaire. It is a short version of the WHO-QOL-100 scales [31]. The WHOQOL-BREF is an international QOL instrument which produces a profile with four domain scores: physical health (7 items), psychological (6 items), social relationships (3 items) and environment domain (8 items). There is also two separately scored items about the individuals' perception of their quality of life (QI) and health (Q2). Each item is scored in a Likert format from 1 to 5. The WHOQOL-BREF has been validated across a wide variety of cultures, including Nigeria [20]. Either the English version or the available back-translated Yoruba version of the instrument was administered on the patients.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) software (version 17) was used for analysis of the data. Results were calculated as frequencies, means and standard deviations. Summary scores were generated for the WHOQOL-BREF by organising the questionnaire items into facets representing the domains covered by the questionnaire. The domain scores of the WHOQOL-BREF were calculated according to the instructors' manual. The two groups (depressed and non-depressed schizophrenic patients) were compared on QOL, clinical and socio-demographic characteristics using independent t test and Chi-square tests. Multiple regression analysis with the stepwise method was used to explore the predictors (socio-demographic and illness related variables) of subjective QOL. Prior to their addition into the regression model to evaluate their predictive effects on the WHOQOL-BREF scores, the categorical socio-demographic variables were transformed and recoded into dummy variables. Each domain of the QOL was the dependent variable and the independent variables included were age, sex, marital status, highest educational level, employment status, duration of illness, age at onset of illness, number of relapse, number of hospitalization due to illness, chlorpromazine equivalents, depressive symptoms, GAF, severity of positive, negative and general psychopathology symptoms. In the multivariate models, a p value <0.10 was used as the criterion for selection. A p value <0.05 was considered statistically significant.

Results

A hundred subjects were recruited in the study with mean age of 40.08 years (SD = 9.98) and majority of the subjects (63.0 %) were aged between 30 and 49 years old. There were 51 (51.0 %) males, 49 (49.0 %) singles, and 43 with secondary education. The largest proportion of the subjects ($n = 97$, 97 %) was from Yoruba ethnic group and 82 (82.0 %) were Christians. Fifty-six (56 %) subjects were employed with mean income of US$123.48 (13.36) and only 32 (32.0 %) earned up to US$66.7 (Table 1). The mean age of onset of illness was 27.52 (SD = 7.53) years while mean duration of illness was 12.55 (SD = 7.92) years. The average number of active symptoms of schizophrenia (relapses) was 3.46 (SD = 1.68) and average number of admissions due to illness was 1.04 (SD = 1.29). Average antipsychotic use in chlorpromazine equivalents per day was 364 (SD = 357) mg. The majority of the patients (86 %) was taking typical antipsychotics while only few (14 %) were taking atypical antipsychotics. In addition, 47 (47 %) patients were taking concomitant anticholinergic agents and 4 (4 %) patients were taking antidepressant medication (amitriptyline only). The mean PANSS total score was 40.47 (SD = 7.44). Twenty-seven (27.0 %) patients were categorised as depressed and the mean Zung SDS score was 43.36 (SD = 12.32). The mean GAF score was 61.30 (SD = 6.46). The mean transformed scores of the WHOQOL domain were 13.58 (SD = 2.26) in the physical health domain; 13.62 (2.24) in the psychological domain; 11.27 (SD = 3.20) in the social relationships domain and 12.83 (SD = 1.84) in the environment domain (Table 2). An independent sample t test has been used to show the associations between depressive symptoms, WHOQOL-BREF domains and PANSS scores (Table 3). Significant associations were found between the presence of depression in schizophrenic patients and all of the domains of WHOQOL-BREF ($p \leq 0.013$), PANSS total and all its subscales ($p \leq 0.002$). All domains of the WHOQOL-BREF were significantly

Table 1 Socio-demographic characteristics of the respondents

Variable	Frequency (%)	Mean (SD)
Mean age		40.08 (9.98)
Age group		
20–29	17 (17.0)	
30–39	31 (31.0)	
40–49	32 (32.0)	
≥50	20 (20.0)	
Sex		
Male	51 (51.0)	
Female	49 (49.0)	
Marital status		
Single	49 (49.0)	
Married	30 (30.0)	
Divorced/separated	18 (18.0)	
Widowed	3 (3.0)	
Highest educational level		
Primary	19 (19.0)	
Secondary	43 (43.0)	
Post secondary (NU)	21 (21.0)	
University degree	17 (17.0)	
Employment status		
Employed	56 (56.0)	
Unemployed	29 (29.0)	
Schooling	10 (10.0)	
Retired	5 (5.0)	
Mean income per month (US$)		123.48 (13.36)
Income per month (US$)		
Nil	39 (39.0)	
<33	16 (16.0)	
33–66.7	16 (16.0)	
66.8–333.3	11 (11.0)	
>333.3	8 (8.0)	

SD standard deviation, *NU* non-university

Table 2 Clinical characteristics of the respondents

Variable	Frequency (%)	Mean (SD)
Mean age of onset of illness		27.52 (7.53)
Mean duration of illness		12.55 (7.92)
Mean number of relapse		
(Active symptoms) of schizophrenia		3.46 (1.68)
Number of hospital admission		
Due to illness		1.04 (1.29)
Antipsychotic drug use		
(Mean CPZE in mg)*		364 (357)
Anticholinergic agent use	47 (47 %)	
Antidepressant use	4 (4 %)	
Psychopathology		
PANSS total		40.47 (7.44)
PANSS positive		11.88 (3.86)
PANSS negative		8.75 (2.48)
PANSS general psychopathology		19.84 (3.50)
Depressive symptoms		
Non-depressed (Zung SDS < 50)	73 (73.0)	
Depressed (Zung SDS ≥ 50)	27 (27.0)	
Mean Zung SDS score		43.36 (12.32)
Mean GAF score		61.30 (6.46)
Quality of life (mean WHOQOL-BREF)		
Physical health domain score		13.58 (2.26)
Psychological domain score		13.62 (2.24)
Social relationships domain score		11.27 (3.20)
Environment domain score		12.83 (1.84)

* Typical antipsychotic use (86 %) and atypical antipsychotic use (14 %)

negatively correlated with the total PANSS and all its subscales (except for psychological domain with total PANSS; social relationships and environment domains with PANSS positive). Severity of depressive symptoms was significantly negatively correlated with all domains of the WHOQOL-BREF. Also, severity of depressive symptoms was significantly positively correlated with total PANSS and all its subscales. GAF had a negative and significant correlation with severity of depressive symptoms. However, it correlated positively with the domains of WHOQOL-BREF except the environmental domain (Table 4). Table 5 shows the socio-demographic and clinical characteristics independently associated with the WHOQOL-BREF domain scores. Physical health domain was significantly predicted by depressive symptoms and GAF ($F = 43.61$, d$f = 2, 97$, $p < 0.001$), which accounted for 47.3 % of the variance in physical health. Psychological health was significantly predicted by depressive symptoms, GAF, highest educational level and employment status ($F = 24.85$, d$f = 4, 95$, $p < 0.001$), which accounted for 51.1 % of the variance in psychological health. Social relationship was significantly predicted by egative symptoms, highest educational level and marital status ($F = 19.76$, d$f = 3, 96$, $p < 0.001$), which accounted for 38.2 % of the variance in social relationship. Environmental domain was significantly predicted by depressive symptoms, highest educational level and marital status ($F = 16.68$, d$f = 3, 96$, $p < 0.001$), which accounted for 34.3 % of variance in environmental domain.

Discussion

This study investigated the relationship between depression and subjective QOL in patients with schizophrenia. It also

studied the effects of psychopathology (positive and negative symptoms of schizophrenia) on subjective QOL. The results of the study showed that the severity of schizophrenic symptoms (measured with the PANSS) and of depression (measured with Zung SDS) significantly influenced the subjective QOL of patients with schizophrenia. Furthermore, the non-depressed patients with schizophrenia had statistically significantly better scores than the depressed patients in the physical health, psychological health, social relationship and environmental domains of the WHOQOL-BREF. Employment status is an important indicator of patient's functioning and the level to which the society offers opportunity for gainful employment [32]. The high percentage of employed patients in this study adds to the literature on better employment status in the developing countries. Co-workers in developing countries were found to be generally tolerant and they rarely make an issue of the unusual behaviour of the patients with schizophrenia [33]. However, it is important to note that the crude comparison of employed and unemployed patients may not be useful without any information on the nature of patient's job and their level of functioning.

It has been suggested that in maintenance of antipsychotics therapies, the optimal dosage range is 300–600 mg chlorpromazine equivalents daily [34]. The average antipsychotic use in chlorpromazine equivalents per day (364 mg) in this study was comparable with a study from Auckland, New Zealand (360 mg) [35] but was low when compared with a study from Japan (596.6 mg) [36]. The stable state of most of our patients probably may account for the low dosage of antipsychotic medications. Only few patients were taking atypical antipsychotic and this is due to the financial burden associated with employing these medications in treating schizophrenia. In addition, only four patients were receiving antidepressants in addition to antipsychotics use. Thus, it is unlikely that medication influenced the relationship between depressive symptoms and QOL.

The apparent overlap between negative symptoms of schizophrenia and depressive symptoms may make differentiating these two states to be clinically difficult especially if the patient lacks the interpersonal communication skills to adequately articulate their internal subjective states. Furthermore, it is possible that clinicians are concentrating

Table 3 Associations between depressive symptoms, WHOQOL-BREF domains and PANSS scores

	Depressed ($n = 27$)	Non-depressed ($n = 73$)	Differences		
	Mean (SD)	Mean (SD)	t	df	p
WHOQOL-BREF					
Physical health	11.53 (2.33)	14.34 (1.71)	6.584	98	<0.001
Psychological	11.65 (2.49)	14.35 (1.63)	6.296	98	<0.001
Social relationships	9.98 (3.21)	11.74 (3.08)	2.523	98	0.013
Environment	11.87 (2.25)	13.18 (1.54)	3.324	98	<0.001
PANSS					
Total	47.48 (6.53)	37.88 (5.95)	−6.979	98	<0.001
Positive	14.07 (4.07)	11.07 (3.46)	−3.671	98	<0.001
Negative	10.00 (3.15)	8.29 (2.01)	−3.212	98	0.002
General psychopathology	23.41 (3.00)	18.52 (2.66)	−7.881	98	<0.001

Table 4 Spearman's correlations between WHOQOL-BREF scores and clinical variables: PANSS, Zung SDS and GAF scores

	PANSS Total	PANSS Positive	PANSS Negative	PANSS Gen psych	Zung Score	GAF Score
Domain 1(PH)	−0.605**	−0.505**	−0.292**	−0.534**	−0.616**	0.424**
Domain 2(PS)	−0.552	−0.402**	−0.337**	−0.514**	−0.580**	0.418**
Domain 3(SR)	−0.367**	−0.160	−0.496**	−0.355**	−0.393**	0.214*
Domain 4(E)	−0.324**	−0.153	−0.398**	−0.330**	−0.427**	0.185
Zung score	0.673**	0.390**	0.382**	0.731**	1.000	−0.235*

PH physical health domain, *PS* psychological domain, *SR* social relationships, *E* environment, *PANSS* the Positive and Negative Syndrome Scale for schizophrenia, *Gen Psych* general psychopathology, *GAF* global assessment of functioning

* $p < 0.05$

** $p < 0.01$

Table 5 The socio-demographic and clinical characteristics associated with WHOQOL-BREF domain scores by regression analysis

Variables	*B*	SE	*β*	*t*	*p*
Physical health domain					
Depressive symptoms	−0.109	0.014	−0.596	−7.861	<0.001
GAF	0.081	0.027	0.231	3.049	0.003
Psychological health domain					
Depressive symptoms	−0.095	0.014	−0.523	−6.743	<0.001
GAF	0.055	0.029	0.160	1.947	0.05
Highest educational level	1.208	0.450	0.204	2.684	0.009
Employment status	0.894	0.387	0.199	2.310	0.023
Social relationship domain					
Negative symptoms	−0.455	0.112	−0.352	−4.072	<0.001
Highest educational level	2.839	0.701	0.335	4.050	<0.001
Marital status	1.500	0.583	0.216	2.573	0.012
Environmental					
Depressive symptoms	−0.056	0.013	−0.373	−4.409	<0.001
Highest educational level	1.560	0.408	0.320	3.825	<0.001
Marital status	0.842	0.336	0.211	2.509	0.014

Stepwise regression method used

GAF global assessment of functioning

on the treatment of psychotic symptoms, believing that alleviation of psychotic symptoms will bring about simultaneous resolution of depressive symptomatology.

The prevalence of depressive symptoms found in this study (27.0 %) falls close to the modal rate of 25.0 % reported in previous studies, although the rates range from 7.0 to 75.0 % [18, 37, 38]. The PANSS was significantly associated with depressive symptoms in schizophrenia in this study. There are two ways in which depression may be related to the psychopathology of the subjective experience of schizophrenia as suggested by Liddle et al. [39]: the 'psychological mechanism' and the 'neural mechanism'. According to the 'psychological mechanism', the subjective experience of deficits may be an indication of vulnerability to depression, which would arise as an understandable expression of the awareness of the loss of mental function. The depressed patients scored significantly lower than the non-depressed in all the domains of WHOQOL-BREF. Also, we found depression to independently predict poorer perception of physical health, psychological health and environmental situations of patients with schizophrenia. Therefore, it is possible that depressive symptoms interfere with some aspects of patient's information processing which could have a negative effect on their evaluation of QOL. When the scores of the specific domains of the WHOQOL-BREF in this study were compared with the scores in Xiang et al. [40] study, in Hong Kong, the scores were comparable.

The subjects in this study had the lowest scores in the social relationship domain of the WHOQOL-BREF compared with the other domain scores. We found negative symptoms of schizophrenia to independently predict only poorer social relationship. The effect of negative symptoms probably obscured the effects of depressive symptoms in this particular QOL domain. This indicates that negative symptoms of schizophrenia may have adverse impact on the ability of patients with schizophrenia in establishing and sustaining social relationships [41, 42].

In this study, both depressive and negative symptoms correlated significantly with all the QOL domains. Thus, understanding the role they play in contributing to QOL in clinically stable outpatients with schizophrenia is very important. The apparent overlap between depressive and negative symptoms may be interpreted as a different manifestation of a similar underlying pathophysiology or two independent processes with similar clinical features. Socio-demographic variables like low level of education and unmarried status as well as poor functioning of patients were found to be associated with poor QOL in this study. Patients that are poorly educated are likely to be in the lower socioeconomic status which has been associated with poor QOL. People with unmarried status (never married, separated and divorced) live more isolated life than the married and this may reflect the effect of schizophrenia on interpersonal and intimate relationships [43].

There were some limitations to this study. First, the study was conducted in a single centre; therefore, may not be representative of the schizophrenic patients QOL scene in Nigeria. In addition, the method of selection of patients may introduce some biases. Most patients were relatively stable outpatients who were willing to participate in the study. Therefore, the final selection of patients in our sample may limit the generalisability of the result. Another limitation of the study was its cross-sectional design. A longitudinal design would permit one to learn more about the nature, course of depression as well as determine the temporal relationship between depression and each domains of WHOQOL-BREF in patients with schizophrenia.

Finally, there were no control groups. A comparison with a control group would have shed light on the differences in the mood symptoms between depressed and non-depressed patients with schizophrenia.

In conclusion, this study has confirmed previous findings that depression is a common occurrence during the course of schizophrenia in many patients. This study also demonstrated that depression has a significant impact on the QOL as measured by the WHOQOL-BREF. Therefore,

it is important for clinicians to detect depressive symptoms in the context of schizophrenia.

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