

Medication adherence among Nigerians with schizophrenia: correlation between clinico-demographic factors and quality of life

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Abstract

Medication adherence contributes significantly to symptom remission, recovery and wellbeing in mental illnesses. We evaluated how medication adherence correlates with clinico-demographic factors and quality of life (QoL) in a sample of Nigerians with schizophrenia. This descriptive cross-sectional study involved 160 randomly selected participants with confirmed diagnosis of schizophrenia based on *MINI International Neuropsychiatric Interview*. Data on socio-demographic and clinical characteristics of participants were collected with a questionnaire. Medication adherence was assessed with *Morisky Medication Adherence Questionnaire*, and participants completed the *World Health Organization Quality of Life Scale-BREF*. The mean age of participants was 38.54 (± 11.30) years, and all the participants were on antipsychotics, but only 45% were adherent to their medication. Out of all the participants, 45 (28.2%) considered their overall QoL to be good, 97 (60.6%) considered theirs to be fair, while 18 (11.2%) reported poor QoL. Medication non-adherence correlated negatively with good QoL across multiple dimensions including overall QoL ($r = -0.175$), health satisfaction ($r = -0.161$), physical ($r = -0.186$) and psychological domain ($r = -0.175$). Again, participant's age ($r = -0.190$) and age of onset of illness ($r = -0.172$) correlated negatively with medication non-adherence, and a trend towards relapse delay with medication adherence was also observed ($r = -0.155$). The effect size of these correlations were however small. Our findings suggest a link between medication

adherence and QoL in schizophrenia, such that strategy that addresses medication non-adherence and its determinants may have potential benefits on wellbeing. Further hypotheses-driven studies are desirable.

Introduction

Schizophrenia is a widely prevalent neuropsychiatric illness with public mental health significance, partly because of its disabling outcome if untreated or poorly treated.¹⁻⁴ Despite being treatable, up to 30 million people suffer from schizophrenia globally, and together with other mental illnesses constitutes leading contributor to disease burden world-wide.³ Closely akin to effective treatment of schizophrenia, symptom remission and recovery is medication adherence.^{1,2}

A review of previous works done among individuals with schizophrenia showed that up to half do not take their medications as prescribed, and socio-demographic along with clinical or treatment-related factors were linked with non-adherence.⁵ Such factors include age, gender, marital status, educational level, poor insight, substance abuse, poorer therapeutic alliance, neurocognitive impairment and medication side-effects among others.^{5,6}

In Nigeria, previous findings have indicated poor attitude towards antipsychotic medications among those with schizophrenia, thereby portending grave consequences to overall outcome.⁷ That said, exploration of the impacts of medication adherence on outcome measure indexed by quality of life (QoL) have not been adequately done in many developing countries, despite QoL constituting important indicator of treatment outcome and the relative costs of illness.⁸ Research interests on QoL issues will likely abound given the recent shift towards adoption of criteria for therapeutic outcome that favours psychosocial concept of health for mental illnesses. As it is, the evaluation of QoL is increasingly becoming integral to the management of chronic conditions like schizophrenia as the definition of treatment outcome embraces client-oriented bio-psychosocial health model. In particular because subjective assessment of QoL in the course of treatment is now considered a better reflection of well-being and a more acceptable measure of actual experience and life satisfaction compared to objective evaluations.⁹ While it has been found from studies that patients' attitudes as well as their adherence to medication significantly affects subjective QoL, knowledge on specific relationship that exists between medication adherence and domains of QoL is

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still limited.^{10,11} Moreover, the scanty evaluation and knowledge of putative markers of those that may be medication non-adherent using routine data collected during assessment present another argument in support of this study. Thus, we evaluated medication adherence in relation to clinico-demographic factors and subjective QoL ratings among a sample of people with schizophrenia in Nigeria. We postulated that medication adherence will correlate with identifiable clinico-sociodemographic factors, and explains the difference in the experience of wellbeing among people with schizophrenia.

Materials and Methods

Study participants

This is a descriptive cross-sectional study among a random sample of 160 outpatients with schizophrenia in a tertiary hospital in Lagos, Nigeria. Ethical approval was obtained from the ethics committee of the institution, and research was conducted in line with the recommendations of the Helsinki declaration. Participants were

given information on the study objectives and reassured they could decline to continue participation at any time without consequence to their clinical care. All participants met the inclusion criteria of age 18 years and above, confirmed diagnosis of schizophrenia based on tenth edition of the *International Classification of Diseases (ICD-10)*¹² criteria, no hospitalization in the last one month preceding interview, and written informed consent to participate in the study. In total, six participants declined consent to be enrolled in the study. The ages of the participants ranged from 20 to 71 years and their mean age (SD) was 38.54 (± 11.30) years; while approximately half of the participants (50.6%) belonged to the 26-40 years age group. A little above half of the participants were females (53.8%), single (51.9%) and employed (59.4%). Majority of the participants (92.6%) had at least secondary education. Nine out of every ten (90%) participants were Christians, and majority (70%) belonged to the Yoruba ethnic group. Thirty-five participants (21.9%) had no source of income. Almost half (45.6%) of the participants spent at least five thousand naira monthly (20 US dollars) on care and 56.3% of them had some form of additional financial support for their care.

Less than half (43.8%) of the participants had their first episode of illness at age 26 to 40 years. The mean age (SD) at onset of illness was 38.68 (± 10.43) and 38.42 (± 12.06) years among male and female respectively. About seven out of ten participants (67.5%) have had at least 3 episodes of illness, and about seven out of ten participants (71.3%) have had 3 hospital admissions on account of schizophrenia.

Study instruments and procedure

The participants were interviewed with a *socio-demographic and clinical questionnaire (SDCQ)* that inquired about age, sex, marital status, educational level and any additional financial support. This was followed by the administration of the *Morisky Medication Adherence Scale (MMAS-4)*.¹³ The MMAS-4 is a measure for adherence with questions about common barriers to adherence. It consists of four items with a scoring scheme of *Yes*=0 and *No*=1. Compared with the 8-item scale, the 4-item scale has been more effectively used in settings in which the health care provider can identify as well as counsel patients by making adherence-enhancing recommendations in line with the specific cause of nonadherence. The dichotomous response helps to obviate acquiescence response bias (a yes bias), and is beneficial for visit-based interpretation.¹⁴ The items in MMAS-4 are summed to give a range of scores from zero

to four (0-4). For this study, any participant scoring more than 0 was considered as non-adherent while those with 0 scores were taken as adherent.¹³ This instrument has been shown to provide good specificity and successful in predicting positive therapeutic outcomes.¹³ MMAS-4 has been validated and used in Nigeria.¹⁵ It has fair psychometric properties. The sensitivity and specificity were 81% and 44%, respectively. Cronbach's alpha reliability is 0.61.¹⁶ The test-retest reliability of MMAS indicates excellent reliability and stability of the instrument with Spearman's rank correlation coefficient of 0.816 ($P < 0.001$).¹⁷

The WHO Quality of Life (WHOQoL-Bref) Scale was administered to participants to assess their QoL. This is a 26 item self-administered instrument which measures QoL.¹⁸ It is a short version of the WHOQoL-100 scale and emphasizes the subjective response of patients in the preceding two weeks. It has cross-cultural application, having been designed in diverse cultural settings including sub-Saharan Africa.¹⁹ It has been validated in Nigeria²⁰ and used in several health related quality of life studies.²¹⁻²⁵ The WHOQoL-Bref is made up of domains (dimensions) and facets (sub-domains). It produces four domain scores. There are also two items that are examined separately: question 1 asks about an individual's overall perception of quality of life and question 2 asks about an individual's overall perception of his or her health. Each item of WHOQoL-Bref has five (5) options to which the patient is expected to respond on a 5 point likert-type scale.¹⁹ Domain scores are scaled in a positive direction (*i.e.* higher scores denote higher quality of life).

In this study, the mean score of items within each domain was used to calculate the domain score.²⁰ Since scores for each quality of life domain follow a normal distribution, categorisation was done around the value of the mean +1 SD with *good* representing values greater than the mean plus one standard deviation; *fair* representing values equal to the mean plus or minus one standard deviation and *poor* representing values less than the mean minus one standard deviation.²¹⁻²⁵ All the researchers are all proficient in Yoruba and English Language, thus helped to address language concern of the few participants who could not respond appropriately to the questionnaires.

Data analyses

Data from the questionnaire were entered into the computer using the *Statistical Package for Social Sciences 16.0 (SPSS 16)*.²⁶ Summary scores were generat-

ed for the WHOQoL-Bref by organising them into facets and domains representing the section covered by the questionnaire. In this study, the mean score of items within each domain was used to calculate the domain score. Mean scores were then multiplied by 4 in order to make domain scores to a 0-100 scale.²⁷ In the relative comparison of the WHOQoL scores among the study participants, those with scores below the mean (score $\pm$ standard deviation) were regarded as having poor quality of life, those whose scores fall within the mean score ($\pm$ standard deviation) were taken as having fair QoL and participants with scores above the mean score ($\pm$ standard deviation) were classified as having good QoL. The participants' scores on the medication adherence scale were correlated with WHOQoL-Bref scores and clinico-sociodemographic variables using Pearson correlation and t-test with the significant level set at $P < 0.05$.

Results

Medication adherence based on MMAS interview

All the participants, 160 (100%) were on antipsychotics and more than half (53.1%) had been on it for as long as 1-7 years. Overall, 72 (45.0%) reported adherence to their medication based on the MMAS-4 interview. The participants' mean score ($\pm$ SD) on MMAS-4 was 2.16 (± 1.87), while mean scores ($\pm$ SD) for males and females were 2.17 (± 1.88) and 2.16 (± 1.87) respectively.

Comparison of WHOQoL mean scores across domains among the participants

Table 1 shows the comparison of participants' mean scores on QoL across the domains. Out of all the participants, 45 (28.2%) considered their overall QoL to be good, 97 (60.6%) considered theirs to be fair, while 18 (11.2%) reported poor overall QoL. In the same light, 33 (20.6%) claimed they were satisfied with their health, while the remaining 29 (18.1%) felt they were not satisfied with their wellbeing. However, more of the participants reported their physical (65.6%), psychological (68.1%), social relationships (70.6%) and environmental (67.5%) domains of QoL to be fair.

Relationship between medication adherence and clinico-demographic factors in participants

There were significant correlation

between adherence to medication and participants age as well as age of onset of illness ($r=-0.190$, $P=0.016$; $r=-0.172$, $P=0.030$) even though the effect sizes were small. Again, there was a trend showing a negative correlation between medication non-adherence and the length of years from previous relapse. ($r=-0.155$ $P=0.051$). None of the other clinico-demographic factors (including income, treatment cost, marital status, education, employment religion, and gender among others) was significantly related with medication adherence ($P>0.05$) (Table 2).

Relationship between medication adherence and QoL among participants

Table 3 shows the comparison of medication adherence scores of the participants with mean QoL scores. Overall, there were significant negative correlations between the overall, health satisfaction, physical and psychological domains of quality of life and medication adherence, meaning participants with poorer medication adherence were more likely to have poorer mean scores on the overall QoL ($r=-0.175$, $P=0.027$), health satisfaction ($r=-0.161$, $P=0.042$), physical ($r=-0.186$, $P=0.018$) and psychological domains ($r=-0.175$, $P=0.027$) of the WHOQoL. The effect sizes of the correlations of medication adherence on all these QoL domains were small as well.

Discussion

Our study looked into medication adherence among people with schizophrenia, and more importantly its relationships with domains of quality of life and clinico-demographic factors in a Nigerian setting. We described a number of important findings therein.

Socio-demographic and clinical characteristics of patients with schizophrenia

The mean age of 38.54 (± 11.30) years and median age of 38 years were found in this study. The participants' mean age was very close to the ones fielded in earlier Nigerian studies,^{1,2,4} and seems to reflect existing knowledge on the nature of the illness which usually occurs around this age bracket.²⁸ Similarly, half of the participants reported that they had their first episode of the illness between age 26 and 40 years, with mean age of onset put at 28.35 (± 9.41) years and median age of 27 years. In gener-

Table 1. Comparison of WHO quality of life scores among the participants (N=160).

QoL dimensions	Mean ($\pm$ SD)	Categories of QoL		
		Poor, n (%)	Fair, n (%)	Good, n (%)
Overall QOL	76.25 (± 20.70)	18 (11.2)	97 (60.6)	45 (28.2)
Health satisfaction	70.19 (± 23.67)	29 (18.1)	98 (61.3)	33 (20.6)
Physical	69.29 (± 15.93)	24 (15.0)	105 (65.6)	31 (19.4)
Psychology	68.09 (± 18.46)	25 (15.6)	109 (68.2)	26 (16.2)
Social relationship	62.20 (± 2.71)	26 (16.3)	113 (70.6)	21 (13.1)
Environmental	69.43 (± 16.72)	18 (11.3)	108 (67.5)	34 (21.2)

SD, Standard deviation; QoL, Quality of Life; n, frequency.

Table 2. Socio-demographic and clinical correlates of medication adherence among participants.

Variables	TOS	df	P
Gender	t=0.818	4	0.936
Male			
Female			
Marital status	t=3.008	4	0.556
Married			
Unmarried			
Formal educational status	t=6.809	4	0.146
Up to secondary school			
Above secondary school			
Employment status	t=3.385	4	0.496
Employed			
Unemployed			
Additional financial support	t=9.579	12	0.653
No			
Yes			
Average monthly income	r=0.041		0.60
Average cost of treatment	r=-0.102		0.200
Age of Participant (in years)	r=-0.190		0.016*
Age at onset of illness (in years)	r=-0.172		0.030*
Last relapse (in years)	r=-0.155		0.051**
Duration of illness (in years)	r=-0.051		0.525
Number of episodes of relapse (in years)	r=-0.067		0.403
Number of in-patient admission	r=-0.005		0.947
Duration on antipsychotic (in years)	r=-0.002		0.976

t, independent t-test; r, Pearson Correlation Coefficient; df, degree of freedom, TOS, test of significance. *Significant $P<0.05$, **trend towards significance

al, the trend in age of incidence largely validates previous findings in Nigeria;^{1,2,4,28} however, differs from the one fielded by Maggio *et al.*, who found a mean age of 20.4 (± 3.0) years in their study pertaining onset of schizophrenia among French cohorts.²⁹ Age of first episode in our work was much later compared to findings by Maggio *et al.*, which perhaps brings to fore the usual late presentation of mental illness to orthodox healthcare facilities in this part of the world due to stigma and its attribution to spiritual or preternatural causes.³⁰ The

Table 3. Correlation between medication adherence and quality of life domains among participants.

Medication adherence	r	P
Overall QoL	-0.175	0.027*
Health satisfaction domain	-0.161	0.042*
Physical health domain	-0.186	0.018*
Psychological health domain	-0.175	0.027*
Social relationship domain	-0.049	0.541
Environmental health domain	-0.084	0.292

df, degree of freedom; r, Pearson correlation coefficient; QoL, Quality of life. *Significant at $P<0.05$.

resultant effect being that many of these cases are managed at the community level by alternative and traditional healers.³¹

About seven in ten of the participants have had at least three episodes of illness and almost three quarters also have had three hospital admissions on account of schizophrenia. A repeated number of relapses and hospital admission shows the chronic nature of the disorder, though the study did not establish if this was partly due to non-adherence to medication. Beyond pointing out the chronic nature of this illness, it also reflects the disabling impacts of the illness, given that the continuous admission of these age groups who form a major part of the labour force may hamper them from contributing meaningfully to the growth of their nations.²

Correlation between medication adherence and clinico-demographic factors

In our study, slightly more than half of the subjects were non-adherent to their medication. This is in keeping with other findings among patients with schizophrenia,^{4,10} and further buttresses the position of Adelufosi *et al.*, who posited that non-adherence to medication is rampant among patients with schizophrenia.³² Medication non-adherence has been reported to be predicted by patient's subjective response and attitude towards antipsychotics,³³⁻³⁵ which could have also been the case in this current study even though this was not assessed. The high rate of non-adherence found in this present study is also consistent with that reported by Valenstein *et al.*, in their retrospective review of antipsychotic adherence over time among 34,128 patients receiving treatment for schizophrenia, where they found that about 61% of their study participants were poorly compliant to medication.³⁶ Overall, this is worrisome, given that poor adherence has been linked with increased risk of symptom exacerbation, homelessness, and interruptions in the continuity of outpatient care.³⁷ Similarly, poor medication adherence may have a deleterious effect on the outcome of the illness and may increase rate of re-admission.⁶ This is also important because cross-sectional studies have linked severity of psychopathology to medication non-adherence.^{38,39}

Some previous studies have indicated that factors such as age gender, marital status, educational level, poor insight, substance abuse, poor therapeutic alliance, neuro-cognitive impairment and medication side-effects are contributory to poor medication adherence.^{5,6} Although ours

did not find any significant relationship between medication adherence and most of these factors other than age of participants, age at onset of illness and length of time from last relapse. Such that medication non-adherence increases with decrease in participant's chronological age and age at onset of illness. This may not be surprising because increasing age may connote better adjustment to illness, higher educational status and improved cognitive ability to interpret the implications of medication non-adherence that include increased risk of relapse. Moreover, medication adherence trended towards being protective against relapse among the participants.

Correlation between medication adherence and domains of QoL

While some studies have attempted to compare measures of QoL with medication adherence in individuals with schizophrenia and even the results from such studies provide conflicting results,^{11,40-44} our study found that participants with poorer medication adherence were more likely to have poorer mean scores on the overall QoL, health satisfaction, physical and psychological of the WHOQoL scale. Even though the effect sizes of these correlations were small, they were consistent with the increasing school of thought that the chronically ill individuals are more likely to report lower QoL following poor adherence to their medication.^{45,46} In general, our findings of poor medication adherence in relation with poorer QoL across multiple domains of WHOQoL further buttressed the importance of ensuring medication adherence in patients with schizophrenia. More importantly, now that medication adherence has been called the *next frontier in quality improvement* and regarded as an important index of treatment outcomes.⁴⁷

Study limitations

Although, our work provides several valuable contributions to existing literature, interpretation of causal relationships between medication adherence and QoL needs to be done with caution. In particular, because of its observational cross sectional design and carried out in tertiary hospital setting. In the same vein, generalizability of the findings in our study to all people with schizophrenia needs to be done with discretion. There is need for future prospective studies to determine the influential roles of medication adherence on wellbeing and identify reliable predictors of medication adherence among people with schizophrenia.

Conclusions

More than half of individuals with schizophrenia in our work were non-adherent to medication. Similarly, medication non-adherence was found to be significantly associated with poorer QoL in consistency with earlier researches. This study suggests that medication adherence has a direct relationship with overall wellbeing, such that strategies that promote medication adherence are potentially beneficial to improving QoL in people with schizophrenia. Conversely, non-adherence could have profound health implications that include poor wellbeing. In this light, proactive measures to address the high rate of non-adherence to medication among individuals with schizophrenia are indicated and may be guided by what is known from clinico-sociodemographic data elicited during routine assessments. It may also be helpful to incorporate screening questionnaires for medication adherence in the evaluation of patients with schizophrenia during review visits, given that it is frequently unrecognized.

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