RESEARCH REPORT

The prevalence and profile of non-affective psychosis in the Nigerian Survey of Mental Health and Wellbeing

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This study aimed to estimate the prevalence and correlates of non-affective psychosis among adult Nigerians. It was part of the Nigerian Survey of Mental Health and Wellbeing and was conducted in 8 out of the 22 states in Nigeria, representing about 22% of the national population. Face-to-face interviews with adults aged 18 years and over were administered using the WHO Composite International Diagnostic Interview, version 3 (CIDI.3). Clinical re-appraisal was conducted by clinicians on a subsample of respondents. The CIDI.3 was found to have acceptable agreement with clinician-administered assessments, with kappa values ranging between 0.52 to 0.72, respectively, for narrowly-defined and broad categories of non-affective psychosis. The lifetime prevalence of non-affective psychosis was 2.1%, with visual hallucinations being the most commonly reported symptom and delusions of reference the least. Non-affective psychosis was significantly more common among urban dwellers. Persons with non-affective psychosis were at elevated risk to report both lifetime and 12-month comorbid DSM-IV disorders as well as to experience impairment in basic and instrumental role functioning. Only a minority had received any treatment.

Key words: Non-affective psychosis, Nigeria, community survey, comorbidity, disability

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Evidence has accumulated in the past few decades that psychotic disorders occur more commonly in the community than previously thought. Studies using endorsement to any item on screening questionnaires have reported estimates of psychosis ranging from 11 to 28% (1-4). Even though there is some evidence that this variability may represent different levels of the same phenotype (4), there is nevertheless substantial lowering of these rates when more rigorous clinical assessments and more restricted definitions of non-affective psychosis are used (1,2). Thus, with clinical review of screening responses or clinical reappraisal interviews following initial screening, rates between 0.5% and 2.8% have been found for non-affective psychosis, often when the DSM-IV criteria have been applied (1-3).

Epidemiological studies of psychosis in the community have been facilitated by the advent of lay-administered interview schedules. However, the validity of the items for the identification of psychosis in such schedules has been questioned (5). While the common experience has been a high rate of false positives (5,6), there has also been a suggestion of false negatives (6), in particular when comparison has been made with identification of cases by key informants (7). The Composite International Diagnostic Interview (CIDI) has been a commonly used tool for this purpose (2,5-7). Recent evidence suggests that its latest version 3.0, providing for clinical review of open-ended questions that accompany the psychosis screening items, has improved validity (1).

We used this version of the CIDI (8), complemented with a clinical reappraisal study, to determine the prevalence of non-affective psychosis in the Nigerian community, the socio-demographic profile of persons with experience of psychosis, and the associated comorbidity as well as disability. Our aim was to provide information about community occurrence of psychosis in both urban and rural areas.

METHODS

The Nigerian Survey of Mental Health and Wellbeing is a community based survey of the prevalence, impact, and antecedents of mental disorders that was conducted between 2001 and 2003 (9,10). It used a four-stage area probability sampling of households to select respondents aged 18 years and over. The section of the survey including a psychosis screen and a clinical reappraisal study was conducted in the Yoruba-speaking areas of Nigeria, consisting of eight states in the south-western and north-central regions (Lagos, Ogun, Osun, Oyo, Ondo, Ekiti, Kogi and Kwara). These states account for about 22% of the Nigerian population (approximately, 25 million people).

In the first stage of the sampling, using an ordered list of all primary sampling units (PSUs) stratified on the basis of states and size, 40 of these PSUs were systematically selected with probability proportional to size. Each PSU was a local government area, a geographic unit with a defined administrative and political structure. In the second stage, four enumeration areas (EAs) were systematically selected from each PSU. EAs are geographic entities including between 50 and 70 housing units.

All selected EAs were visited by research interviewers prior to the interview phase of the survey and an enumeration and listing of all the household units contained therein was conducted. These lists were entered into a centralized computer data file, thus creating a sample in which the probability of any individual household being selected to participate in the survey was equal for every household within an EA. In the final stage of the selection, interviewers obtained a full listing of all residents in the household from an informant. After identifying household residents who were aged 18 years or over and were fluent in the language of the study,

Yoruba, a probability procedure was used to select one respondent to be interviewed. The Kish table selection method was used to select one eligible person as the respondent (11). Only one such person was selected per household. When the primary respondent was either unavailable following repeated calls (five calls were made) or refused to participate, no replacement was made within the household.

On the basis of this selection procedure, face-to-face interviews were carried out on 4,984 respondents. The response rate for this section of the survey was 79.9%. Respondents were informed about the study and provided consent, mostly verbal but sometimes signed, before interviews were conducted. The survey was approved by the University of Ibadan/University College Hospital, Ibadan Joint Ethical Review Board.

Diagnostic assessment was done with the CIDI 3.0 (8). Of the two components of the interview, Part 1 (covering a core set of diagnoses) was carried out with all respondents, while Part 2 (comprising the psychosis screen and covering several correlates of mental disorders, including disability) was carried out with Part 1 respondents who met criteria for any of a selection of mental disorders and with a probability sample of others.

The psychosis screen (administered to about 84% of Part 1 respondents) enquires about the lifetime occurrence of six symptoms (visual hallucinations, auditory hallucinations, thought insertion, thought control, delusions of reference, and delusions of persecution), with yes-no response options. Any positive response was followed by questions asking the respondent to describe the instances of the symptom and to provide their own interpretation of the experience. These responses were recorded verbatim. Follow-up questions also asked about age of onset, persistence, 12-month occurrence and probes about possible organic etiology (especially alcohol or drugs). These verbatim records as well as responses to the subsequent questions were then reviewed by one of the researchers, who assigned a rating of probable, possible, or unlikely to meet DSM criterion for the symptom. Only responses rated as probable or possible were included in this analysis.

Clinical reappraisal face-to-face interviews were conducted using the Structured Clinical Interview for DSM-IV (SCID, 12) by two senior residents in psychiatry who had received a structured training in the use of the instrument prior to field work. The clinical reappraisal interviews were conducted on 56 respondents randomly selected from among screen positives and screen negatives. All interviews were jointly reviewed and diagnostic assignment was based on consensus between the interviewers and the supervisor.

Several other mental disorders were assessed in the Nigerian Survey on Mental Health and Wellbeing. In this report, we present data concerning comorbidity of non-affective psychosis with any anxiety disorders (panic disorder, generalized anxiety disorder, agoraphobia without panic disorder, specific phobia, social phobia, post-traumatic stress disorder, obsessive-compulsive disorder), any mood disorders (major depressive disorder, dysthymia, bipolar disorder), any impulse control disorder (oppositional-defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder), and any substance use disorders (alcohol and drug abuse and dependence). DSM-IV organic exclusion rules were applied to all diagnoses, and so were hierarchy rules, except in the case of substance use disorders, where abuse is defined with or without dependence.

We determined the relationship of non-affective psychosis to functional role limitations or disability using the World Health Organization Disability Assessment Schedule (WHO-DAS, 13). The instrument permits the assessment of three domains of basic activity (cognition, mobility and self-care) and performance of instrumental roles (days totally out of role and days with reduced quality of productive role performance). Impairment was rated as present for a "yes" response to the summary items for basic activity or a score ≥90th position on the percentile distributions of the sample on items for the two instrumental roles. These ratings were made over the previous 30 days.

Persons with a 12-month episode of non-affective psychosis were asked if they had consulted any care provider for the experience. Care provider could be any mental health specialist, any general health provider, or alternative/complementary health practitioners (spiritual or traditional healers).

We examined the association between non-affective psychosis and socio-demographic variables of age, sex, marital status, education, residence. Residence was classified as rural (less than 12,000 households), semi-urban (12,000-20,000 households) and urban (greater than 20,000 households).

In order to take account of the stratified multistage sampling procedure and the associated clustering, weights have been derived and applied to the rates presented in this report. The first weighting adjusts for the probability of selection within households and for non-response. Also, post-stratification to the target sex and age range were made to adjust for differences between the sample and the total Nigerian population (according to 2000 United Nations projections). The weight so derived, termed "Part 1 weight", was normalized to reset the sum of weights back to the original sample size of 4,984.

A second weight, termed "Part 2 weight", was also derived and applied to a probability sub-sample of the survey sample who completed the long form of the interview or Part 2. The Part 2 weight is a product of Part 1 weight as well as the empirical probability of selection into the group with the long interview. This probability varied according to the presence or absence of selected diagnostic symptoms. Thus, all persons who endorsed a set of diagnostic symptoms in the Part 1 of the interview were selected into Part 2 with certainty (i.e., probability=1.0). All others were randomly selected into Part 2 with a constant probability of 25%. The weight was then normalized to reset the sum of weights back to the sample size of 1,682. The section on psychosis was administered to 1,419 of these.

The analysis has taken account of the complex sample

design and weighting. Thus, we used the jacknife repeated measures implemented with the Stata statistical package (14) to estimate standard errors for proportions. Demographic correlates were explored with logistic regression analysis (15) and the estimates of standard errors of the odds ratio (ORs) obtained were made with Stata. All of the confidence intervals reported are adjusted for design effects.

RESULTS

The CIDI screen showed acceptable agreement with clinician-administered assessments for the detection of non-affective psychosis. For a broadly-defined non-affective psychosis (any psychosis), it had a sensitivity of 90% and a specificity of 93%. When a narrowly-defined non-affective psychosis group (consisting of schizophrenia and schizophreniform psychosis) was the focus, the respective values were 83% and 86%. The positive predictive value was .75 for broad non-affective psychosis and .42 for narrow non-affective psychosis, while the respective kappa values were .72 and .52. Analysis of the three false positives showed that two were thought to have manic ideas that were not considered delusional and one was assessed as a case of organic psychotic reaction. The single case of false negative was one of delusional disorder.

As shown in Table 1, the lifetime estimate of any psychotic experience was 2.1%. Visual hallucinations were the most commonly reported symptom (1.2%), while delusions of reference were the least (0.2%). The estimated 12-month prevalence of any psychotic symptom was 1.1%.

Table 2 shows relevant clinical details of the lifetime cases. The mean age of first occurrence was 25.8 years, with the mean age of onset being earlier in males compared to females, even though this difference was not statistically significant. Older cohorts reported later age of onset, and this was significant for the entire group, but not significant when the sexes were considered separately. Most people who reported psychotic symptoms had experienced them on multiple occasions. A mean lifetime episodes of about 22 and a mean of about 5 in the prior 12 months were reported by lifetime and 12-month cases, respectively. No gender difference was found for mean number of episodes, either lifetime or 12-month. There was a significant association with age for lifetime episodes for the entire group. However, the pattern was not linear in either direction. Indeed, the highest mean values for both lifetime and 12-month periods tended to be found in the cohort aged 20-44 years.

Compared to females, males were more likely to have experienced lifetime non-affective psychosis (OR=2.5; 95% CI 1.2-5.3). There was a non-significant increased likelihood of a lifetime experience of non-affective psychosis in persons who had never married (OR=1.5; 95% CI 0.5-4.4) or had separated or divorced (OR=1.6; 95% CI 0.5-5.0) when compared to those who were in marriage. Compared to rural dwellers, there was a significantly elevated risk of reporting lifetime non-affective psychosis by persons living in semi-urban (OR=6.4; 95% CI 1.3-32.3) and urban (OR=4.3; 95% 1.1–17.5) communities.

Table 1 Prevalence of symptoms of non-affective psychosis (n=1419)

	Males, % (SE)	Females, % (SE)	Total, % (SE)
Visual hallucinations	1.9 (0.7)	0.5 (0.2)	1.2 (0.3)*
Auditory hallucinations	0.9 (0.5)	0.8 (0.3)	0.9 (0.3)
Thought insertion	0.6 (0.5)	0.2 (0.1)	0.4 (0.3)
Thought control	0.8 (0.5)	0.3 (0.1)	0.6 (0.2)
Delusions of reference	0.4 (0.4)	0.07 (0.06)	0.2 (0.2)
Persecutory delusions	0.5 (0.4)	0.2 (0.1)	0.4 (0.2)
Any psychosis	3.0 (0.9)	1.2 (0.4)	2.1 (0.5)*

*Significant difference between males and females, p<0.05

Table 2 Clinical history of non-affective psychosis by age and sex

		Males (n=23)		Females (n=16)		Total (n=39)	
	Cohorts	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)
Mean age of onset (years)	18-29	8	15 (2.10)	2	14 (5.00)	10	14.8 (1.82)
	30-44	4	20.75 (5.29)	7	23.57 (3.25)	11	23.27 (2.69)
	44-59	5	27.0 (5.55)	4	31 (8.20)	9	29.0 (4.48)
	60+	6	36.67 (8.91)	3	40 (8.66)	9	37.78 (6.29)
	All ages	23	24.26 (3.23)	16	28.19 (3.32)	39	25.77 (2.33)
			F=3.00, p=0.04		F=2.06, p=0.16		F=5.76, p=0.003
Mean number of 12 month episodes	18-29	2	3.5 (2.50)	0	-	2	3.5 (2.50)
	30-44	0	-	2	16.5 (3.50)	2	16.5 (3.5)
	44-59	3	3.67 (0.88)	3	3 (1.00)	6	3.33 (0.61)
	60+	2	2.5 (0.50)	1	3 (0.00)	3	2.67 (0.33)
	All ages	7	3.29 (0.68)	6	7.5 (3.02)	13	5.23 (1.50)
			F=0.20, p=0.83		F=11.95, p=0.03		F=18.45,p<0.001
Mean number of lifetime episodes	18-29	8	8.0 (1.57)	2	9.5 (6.5)	10	18.2 (6.36)
	30-44	4	9.25 (2.17)	7	21.14 (6.73)	11	28.64 (6.32)
	44-59	5	12.4 (3.36)	4	13.25 (6.34)	9	17.89 (5.10)
	60+	6	21.67 (8.31)	3	11.33 (4.67)	9	220.0 (6.55)
	All ages	23	12.74 (2.51)	16	15.88 (3.52)	39	21.95 (3.05)
			F=1.80, p=0.18		F=0.56, p=0.65		F=0.70, p=0.56

Table 3 Comorbidity of lifetime non-affective psychosis with other DSM-IV disorders (n=1419)

	Lifetime comorbidity		12-month comorbidity	
	% (SE)	OR (95% CI)	% (SE)	OR (95% CI)
Any mood disorder	12.7 (5.5)	4.8 (1.7-13.4)*	4.8 (3.8)	5.2 (0.8-34.1)
Any anxiety disorder	15.0 (7.1)	3.1 (1.0-10.1)*	2.8 (1.6)	3.1 (0.8-12.5)
Any impulse control disorder	1.2 (1.3)	5.6 (0.4-77.4)	0 (0)	0 (0)
Any substance use disorder	7.8 (4.1)	2.1 (0.6-7.5)	8.3 (7.4)	9.3 (1.0-84.6)*
Any disorder	25.1 (1.7)	2.7 (1.0-7.6)*	2.2 (3.5)	2.4 (0.6-9.5)

*Significant at the 0.5 level, two-sided test, after controlling for age and sex

Table 4 Association of non-affective psychosis with impairments in basic and instrumental functioning assessed in the WHO Disability Schedule (n=1419)

	Percent with impairment (SE)	OR (95% CI)
Basic functioning		
Cognition	8.2 (3.9)	4.8 (1.7-13.9)*
Mobility	1.5 (1.1)	0.4 (0.1-2.2)
Self care	1.0 (1.0)	1.6 (0.2-16.8)
Social activities	4.2 (3.5)	4.3 (0.8-22.5)
Instrumental functioning		
Days out of role	19.2 (6.0)	2.4 (1.1-5.2)*
Productive role performance	12.4 (4.4)	1.5 (0.7-3.2)

*Significant at the 0.5 level, two-sided test, after controlling for age and sex

Lifetime non-affective psychosis increased the likelihood of lifetime occurrence of other mental disorders (Table 3). The odds for comorbid lifetime mental disorders ranged from 2.12 for any substance use disorder to 5.6 for impulse disorder. The same pattern was noticed among 12-month cases of non-affective psychosis but, due to small numbers, the association was only significant for substance use disorders.

Persons with lifetime non-affective psychosis had evidence of impairment in various areas of functioning in the 30 days prior to assessment (Table 4). Specifically, they were more likely to have impairment of cognition and self care as well as that of instrumental functioning (days out of role), even though statistical significance was achieved only for cognition and days out of role.

Only 2 (15%) of the 13 persons who had experienced non-affective psychosis in the prior 12 months reported any treatment for emotional disorder in that period. Both had made multiple contacts with general practitioners and complementary alternate health providers. None had received treatment from mental health specialist services.

DISCUSSION

In this study of a representative community sample in Nigeria, we found a lifetime prevalence of 2.1% and a 12-month estimate of 1.1% of non-affective psychosis. Males had significantly higher lifetime rates than females. Visual hallucinations were the most common psychotic experiences. Although an earlier age of onset was reported by males than females, the difference was not statistically significant. Lifetime psychotic experience was more commonly reported by persons who had never been married or those who had separated or divorced. There was a significant association with urbanicity, with higher rates being found among semi-urban and urban dwellers compared to persons residing in rural areas. Most people with psychotic symptoms had experienced them on multiple occasions, with lifetime average of 22 episodes and a 12-month average of 5.

Persons with psychotic experiences were more likely to have experienced other comorbid mental disorders such as mood, anxiety, impulse control, and substance use disorders. Psychotic experience was associated with significant disability. Persons with lifetime experience were more likely to be among those classified as highly impaired based on a score above the cut-off point on the WHO-DAS scale for days out of role. They were also more likely to be impaired in the areas of cognition and social activities. In spite of this profile of comorbidity and disability, most of the persons identified in this survey had not received any form of formal care, either orthodox or traditional.

Widely varying estimates have been reported for psychotic symptoms in community surveys. Van Os et al (4) reported a prevalence of 4.2% for narrowly-defined psychotic symptoms and 17.5% for broadly-defined symptoms. Psychotic symptoms are notoriously difficult to assess with structured interviews. While the common experience has been that of low specificity and high false positives, some workers have also reported the problem of high false negatives. For example, clinical re-interview of persons who endorsed CIDI psychotic items in a general population study using the SCID found post-test probabilities to range between 5.1 and 26.5% for the individual CIDI items (5). On the other hand, Kebede et al (7), reporting on a survey conducted in rural Ethiopia, found that the CIDI identified fewer cases of schizophrenia than the use of key informants in the community, and Perala et al (6) observed that a reliance on CIDI screening questions alone would have resulted in the identification of only 26.5% of psychotic disorders in their community survey. One may surmise from these observations that the performance of CIDI could be affected by the form of the psychotic disorder (acute or chronic, for example) or by cultural factors relating to whether psychotic symptoms would be endorsed by respondents in interviews conducted by lay persons.

However, these authors used the earlier versions of the

CIDI. The CIDI 3.0 screening questions used in the current study have undergone considerable revision to reduce the problem of false positives (8). As described by Kessler et al (1), this section of the instrument begins by encouraging respondents to think carefully about their answers to the questions and specifying that the intent of the questions is to elicit the presence of "unusual experiences". An important difference between these questions and those in the original CIDI is that they have undergone modification to capture the way psychotic symptoms are commonly experienced in the community (1). The difference between the earlier and current versions of the CIDI is substantial. Thus, while 28.4% of respondents endorsed one or more psychotic symptoms in the National Comorbidity Survey, in which the older version of the CIDI was used, only 9.1% did so in the National Comorbidity Survey Replication with the use of version 3.0 (1,2).

Our estimate of 2.1% for lifetime prevalence of psychosis is similar to the 1.5% following preliminary review of CIDI open-ended responses reported in the National Comorbidity Survey Replication by Kessler et al (1). However, these authors found that, following clinical reappraisal interviews using SCID, the lifetime prevalence of non-affective psychosis was 0.5%, suggesting that, even with the preliminary review of the open-ended responses and reclassification based on that review, there was still a substantial level of false positives. However, in the sample here reported, clinical reappraisal study of a random selection of screen positives and screen negatives suggests that the screening questions have acceptable screening properties for their use in this setting. Our lifetime prevalence estimate falls within the range of 0.85-2.37% reported by Ochoa et al (3), who had used the same version of CIDI followed by a clinical reappraisal interview with SCID, and close to the 1.94% reported for non-affective psychosis by Perala et al (6) using multiple sources of information.

The finding that visual hallucinations were the most commonly reported symptom, especially among men, is surprising, given that this symptom is not often associated with non-organic psychosis in clinical settings. However, this finding is similar to that reported in the National Comorbidity Survey Replication, where the CIDI screening item for visual hallucinations had the highest rate of endorsement (1). In that survey, even though a high proportion (25.4%) of the experience of visual hallucinations was classified as odd but not psychotic, about one-third of the 6.3% screen positives were classified as either probable or possible cases of non-affective psychosis, thus giving a prevalence of over 2%, an estimate that is much higher than reported here. It would appear that, at least in the community, visual hallucinations are not an uncommon experience for persons with non-affective psychosis.

Even though the relative rarity of psychosis in this community study has resulted in a small number of cases and consequent poor statistical power for analytic exploration, the correlates of psychosis that we found are in accord with those of previous reports (1,6,16-18). Persons with psychosis were more likely to be male and less likely to be married. An interesting observation is the clear association with urbanicity. A somewhat similar observation had been made in Ethopia (16), even though that study was conducted in a relatively narrower geographic spread than the present one. We have not explored whether this association is with urban upbringing or with urban adult residence, so we are unable to speculate whether this association reflects developmental mechanisms or reversed causation. Nevertheless, the association is of interest, because the form and import of urbanicity must be different between a developing sub-Saharan African country and Western European countries where such finding has been previously reported (3,19,20).

Lifetime psychotic experience was also associated with an increased likelihood of other mental and substance use disorders, either occurring over a lifetime or in the prior 12-months. Persons with lifetime psychosis were more likely to report functional role limitations and disability, especially in regard to inability to perform usual role and disability in cognition and social roles. These correlates, very similar to those reported by Kessler et al (1), are important not only in showing the level of disability among these community cases but also in providing a validation for the ascertainment procedure used in this report. Nevertheless, we think that, for reasons stated below, our estimate was probably very conservative.

Epidemiological studies of psychosis in a developing country face a dilemma. As shown in this report, a considerable proportion of persons with lifetime experience of psychosis do not seek formal care, either because of inaccessibility of service or because of stigma (21). Yet, it is possible that a household survey, such as we employed here, may capture those at the milder end of the psychosis spectrum. On the other hand, studies at service points, such as those carried out in better resourced settings (22), would provide a very skewed profile in a developing country setting. At those points, it is conceivable that those with behavioural problems, especially those of aggression and violence, will predominate, with consequent undercounting and unrepresentative clinical profile. The study by Kebede et al in Ethiopia (7), where key informants identified more cases of schizophrenia than did CIDI interviews, would tend to suggest that non-response and denial of symptoms might have played a part in reducing the sensitivity of the CIDI in that setting. It would therefore appear that case identification in a developing country setting would be strengthened by a combination of strategies (6). These may include identification from various service points (including spiritual and traditional healing homes) to assess persons with more disturbed behaviour, use of key informants to pick cases of overt behavioural problems that may not have led to treatment seeking (such as those with predominantly negative symptoms), as well as household surveys to help identify cases with covert or overt symptoms (such as the positive symptoms elicited by the CIDI) who may have not sought treatment.

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