Psychiatry Research 196 (2012) 235–242

Contents lists available at SciVerse ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Prevalence and characteristics of psychotic-like experiences in Kenyan youth

David M. Ndetei [a,b], Susan K. Muriungi [c], Akinkunle Owoso [d], Victoria N. Mutiso [b], Anne W. Mbwayo [b], Lincoln I. Khasakhala [b], Deanna M. Barch [d,e,f], Daniel Mamah [d,*]

[a] Department of Psychiatry, University of Nairobi, Kenya
[b] Africa Mental Health Foundation, Nairobi, Kenya
[c] Kenya Medical Training College, Nairobi, Kenya
[d] Department of Psychiatry, Washington University, St. Louis, MO, USA
[e] Department of Psychology, Washington University, St. Louis, MO, USA
[f] Department of Anatomy & Neurobiology, Washington University, St. Louis, MO, USA

ARTICLE INFO

Article history:
Received 7 July 2011
Received in revised form 30 December 2011
Accepted 31 December 2011

Keywords:
Psychosis
College
Kenya
Africa
Youth
Psychotic experiences

ABSTRACT

Current evidence suggests that there may be significant differences in psychotic symptom prevalence in Africa compared with other cultures. However, there have been few studies evaluating these symptoms in the continent. We conducted a cross-sectional survey of psychotic-like experiences (PLEs) in 2963 Kenyan students from seven tertiary academic institutions spread across Kenya, using a self-administered psychosis questionnaire evaluating psychotic experiences and demographic variables. Logistic regression was used to evaluate relationship between PLEs and demographic variables. Latent class analysis (LCA) was used to determine specific classes of psychotic experiences. Twenty-three percent of respondents reported having at least one PLE, and 19% reported this unrelated to drug use or sleep. Compared to students identifying as Protestant Christians, Catholics had a lower likelihood of having any PLE or visual hallucinations. Other demographic variables were not significantly associated with PLEs. LCA of PLEs resulted in a three-class model that comprised 1) a non-psychotic class (83.8%), 2) a predominantly hallucinatory class ("type I PLE"; 12.7%), and 3) a multiple symptom class ("type II PLE"; 3.5%). Both psychotic classes had a predominance of male students. Further studies are required to clarify functionality and clinical progression associated with observed patterns of psychosis, as well as the generalizability of our findings.

1. Introduction

Individuals who report psychotic-like experiences (PLE) have been found to be at increased risk of future psychotic disorders (Simon et al., 2001; Verdoux and Cougnard, 2006; Kelleher et al., 2011). A growing body of evidence suggests that PLEs such as delusionary or hallucinatory experiences are much more frequent in the general population than psychotic disorders, suggesting the existence of a symptomatic psychosis continuum in the community (Johns and van Os, 2001; Verdoux and van Os, 2002). Explorations of the expression of PLEs in a non-clinical population, in addition to symptoms in defined disorders, are therefore necessary to better understand the etiology and pathogenesis of psychosis (Verdoux and van Os, 2002).

The reported prevalence rates of PLEs appear to be dependent on the specific population studied (Nuevo et al., 2010). For example, community surveys in various countries have shown rates ranging from about 1 to 46% (Ochoa et al., 2008; Morgan et al., 2009; Gureje et al., 2010; Jenkins et al., 2010; Nuevo et al., 2010; Gale et al., 2011), while others have reported a higher prevalence in university students compared to the general population (Loewy et al., 2007). There has been only minimal investigation of PLEs in Africa, due to a dearth of psychiatric research relative to that in many developed countries (Ndetei, 2008). However, it is expected that their rates would far exceed that for diagnosable psychotic illness in the continent. Results from systematic reviews of schizophrenia have been variable, suggesting both similar (Saha et al., 2006) and differing (Goldner et al., 2002) rates across cultures. Delusional ideation has been reported to be more frequent in a rural Ugandan community, compared to studies conducted in Europe (Lundberg et al., 2004), but such cultural comparisons are limited by differences in the world view of concepts, which may influence the perception of psychotic illness (Ndetei and Vadher, 1984; Maslowski and Oosthuizen, 1993; Maslowski et al., 1998; Okulate and Jones, 2003; Teuton et al., 2007; Olugbile et al., 2009). Others have found up to a 10-fold difference in rates of paranoid schizophrenia between high prevalence regions such as western Ireland and northwestern Croatia and the lowest prevalence regions in many developing countries (Torrey, 1981). In Africa, the prevalence of schizophrenia is often noted to be relatively low, ranging between 4.3 and 60.0 per 1000 (Ben-Tovim

* Corresponding author at: Department of Psychiatry (Box 8134), Washington University School of Medicine, 660 S. Euclid, St. Louis, Missouri 63110, USA. Tel.: +1 314 747 2160; fax: +1 314 747 2182.
E-mail address: mamahd@psychiatry.wustl.edu (D. Mamah).

0165-1781/$ – see front matter © 2012 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.psychres.2011.12.053

and Cushnie, 1986; Tafari et al., 1991; Kebede et al., 2003); however, rates of illness may be underestimated due to cultural differences in clinical presentation, inaccurate translation of survey tools, or assessment of non-representative populations.

Kenya is a developing nation in Eastern Africa, with the poverty incidence estimated to be above 50%, with varying rates regionally (Central Bureau of Statistics, 2005). Most Kenyans are bilingual in English and Swahili, which facilitates the use of epidemiologic surveys developed in English. Kenya also has a relatively young population, with about two-thirds being 24 years or younger (Kenya National Bureau of Statistics, 2009). Therefore, assessments done in Kenyan youth are significant in understanding, to a large degree, the mental well-being in the country. Considering the high illiteracy rate in sub-Saharan Africa, there may be a unique advantage in conducting self-administered surveys from students with higher educational attainment, who would be expected to be more likely to comprehend survey items than those from the general community. This is particularly important when investigating relatively complex phenomena such as psychotic experiences. It is estimated that about 3% of the tertiary school-aged cohort in Kenya is enrolled in colleges or universities (Kimalu, 2001; Otieno and Ngolovoi, 2009). Colleges and universities in Kenya both offer undergraduate training, although colleges are considered less competitive than universities.

Our current study investigates the prevalence of various PLEs in Kenyan college students, and their relationship to key demographic variables. It is expected that PLEs will be significantly more common than rates of psychotic illness in Africa. We further examine gender-related differences in prevalence rates, and consistent with previous studies of psychosis (Spauwen et al., 2003; Scott et al., 2008), we hypothesize that PLEs will be more prevalent in males. Finally, we explore patterns of psychotic experiences, which may identify unique classes of affected individuals.

2. Methods

2.1. Participants

A total of 3250 students were invited to participate, out of which 2963 students completed the questionnaire. Participants ($N=2963$) consisted of college students from seven tertiary academic institutions spread across Kenya (Kisumu, Meru, Muranga, Nairobi, Nakuru, Mombasa, and Port Reitz), and were fluent in English. All participants were students specializing in health fields in the various institutions, and their ages ranged from 15 to 48 years. Prospective participants were informed of the study during a break while in class, and asked to gather back in class at a designated time. The requirements of the study were described, and students were given the options to decline or to participate and assured of anonymity. A research assistant distributed questionnaires and was available if needed.

Demographic profiles of participants ($n=2963$) are shown in Table 1. Written and signed consent was obtained from all participants. The study was approved by the Kenyan Medical Research Institute (KEMRI), and the Ministry of Education, Science and Technology, Kenya.

2.2. Assessments

Participants completed the *psychosis screen* (Part 2) of the World Health Organization's Composite International Diagnostic Interview, version 3.0 (CIDI 3.0) (Kessler and Ustun, 2004), which examined six different domains of past or lifetime psychotic experience: 1) visual hallucinations, 2) auditory hallucinations, 3) thought insertion and broadcasting, 4) belief that one's mind was being controlled by an outside force (mind control), 5) referential thinking, and 6) persecutory ideation. For each domain, participants were asked to report whether or not they had ever experienced the phenomenon and, if so, if it had occurred outside of dreaming, being half-asleep, or under the influence of alcohol or drugs. Previous validity studies of the CIDI psychosis module have shown high agreement with clinician interviews when symptoms are based on questions asked of participants, and less so for symptoms requiring interviewer judgment (Cooper et al., 1998; Gureje et al., 2010). Additional items on the questionnaire investigated the number of times psychotic experiences had occurred, and why participants believed the phenomenon had occurred (i.e. attribution). Data were also obtained regarding whether participants had ever sought help or treatment from a mental health professional for any reported symptoms, been given a psychiatric diagnosis, or been hospitalized for any psychotic experience.

Table 1
Demographic profiles of surveyed Kenyan university students ($N=2963$).

Demographic variable	Value[a]
Age (years)	
Mean (standard dev.)	21.3 (2.8)
Gender	
Female	1430 (48.3)
Male	1513 (51.1)
Not provided	20 (0.7)
Marital status	
Single	2774 (93.6)
Married	132 (4.5)
Other	57 (1.9)
Religion	
Protestant	1779 (60.0)
Catholic	851 (28.7)
Muslim	131 (4.4)
Other	164 (5.5)
Not provided	38 (1.3)
Residence	
Home/with relatives	390 (13.5)
University hostel	2164 (74.7)
Other hostel	313 (10.8)
Other	31 (1.1)

[a] Values are given as number of participants (percentages), unless stated otherwise.

2.3. Statistical analysis

General statistical analyses were done using SPSS 11.0.1 (SPSS Inc., Chicago, IL). Group comparisons were performed using Pearson chi-square (χ^2) test or the Fisher exact test (two-tailed for all tests). Logistic regression was used to calculate odds ratios, describing the strength of association between demographic variables and psychotic experiences.

We used latent class analysis (LCA) (McCutcheon, 1987; Yang and Becker, 1997; Sullivan et al., 1998) to determine empirically the typologies of psychotic experiences in Kenyan students. LCA is a "categorical analog" to factor analysis and is particularly appropriate for data on the presence or absence of symptoms. Using Latent Gold 4.5 (Statistical Innovations, Belmont, MA), we applied LCA to a 1271×6 data matrix in an iterative manner. The rows corresponded to 1271 of 2963 surveyed Kenyan students who completed all six psychotic experience and gender items on the questionnaire. We included gender as a co-variate in the analysis to allow for the possibility of gender-related differences in symptoms. We determined the best class solution with reference to the lowest Bayesian information criterion (BIC), among one- to six-cluster solutions generated. BIC values were: 1-class: 3746; 2-class: 3132; 3-class: 3110; 4-class: 3142; 5-class: 3187; 6-class: 3237. BIC takes into account the number of parameters used in model estimation (Schwarz, 1978) and rewards models with fewer classes that more accurately reproduce the data. Smaller BIC values are preferred as they represent model improvement over larger values. We had relatively clear evidence in favor of a three-class solution (BIC values not shown). Individual subjects were then assigned class membership based on the likelihood of their particular response profile. We then explored LCA class differences in the rates of 1) demographic variables, 2) individual psychotic experiences (i.e. prevalence, frequency and attributions), and 3) history of professional treatment. Given the number of variables compared, the overall type I error was inflated. We employed a two-tailed significance level of 0.01 to compensate partially for the number of comparisons.

3. Results

3.1. Demographics

The demographic profiles of the 2963 students surveyed are shown in Table 1. The remaining students either did not return to class for the study, or did not complete the questionnaire without giving a reason. The mean (standard deviation (S.D.)) age of the students was 21.26 (2.77) years, the median age was 21 years, and ages ranged between 15 and 48 years. There were 54 students aged 30 and above.

3.2. Prevalence and presentation of psychotic experiences

Prevalence of psychotic experiences among the students surveyed is reported in Table 2. Among those who completed the entire