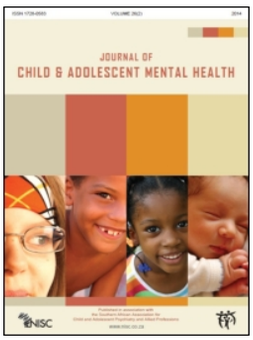

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# The prevalence of anxiety and depression symptoms and syndromes in Kenyan children and adolescents

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***Background:*** **Community studies on children and adolescents in Western settings suggest prevalence rates of anxiety and depressive symptoms that require intervention.**
***Aim:*** **To establish equivalent prevalence rates in a Kenyan (developing country) situation**
***Method:*** **Self-administered questionnaires for socio-demographic data, three Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV)-based instruments for anxiety symptoms and syndromes in children, one instrument for depression and one culture sensitive instrument for depression and anxiety were administered in three different sets to 3 775 randomly sampled students drawn from a stratified sample of 34.7% of all public secondary schools in Nairobi, Kenya.**
***Results:*** **The prevalence rates of anxiety and depression symptoms and syndromes varied widely depending on sex and age and also on the emphasis of the different instruments used, and also according to the cut-off points for the various syndromes and instruments. Clinical diagnostic scores for depression were recorded in 43.7% of all the students. Using the cut-off points for the Multidimensional Anxiety Scale for Children (MASC), anxiety was recorded in 12.9% of all students. Nearly half (40.7%) of the respondents who completed the Short Leyton Obsessional Inventory for Children and Adolescents had positive scores for obsessive disorder, 81.1% were positive for compulsive disorder and an average of 69.1% had positive scores for both obsessive and compulsive disorders combined. Amongst those who completed the Ndetei-Othieno-Kathuku (NOK) scale for Depression and Anxiety, 49.3% had positive scores for moderate to severe anxiety with or without depression. The Screen for Child Anxiety Related Disorders – Revised (SCARED-R) yielded high levels (50–100%) for the different syndromes, with obsessive-compulsive disorder at 99.3%, just below separation anxiety and school phobia at 100%. Suicidal thoughts and plans were prevalent at 4.9–5.5%.**
***Conclusion:*** **Anxiety and depression were found at prevalence rates no less than is found in the West. This calls for appropriate clinical practices and policies.**

## Introduction

### *Anxiety symptoms and syndromes in children and adolescents in community studies*

A comprehensive review of the available epidemiological data has shown that 8–12% of youth suffer from anxiety complaints that are severe enough to interfere with daily life and functioning (Bernstein, Borchardt and Perwien 1996). According to the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV) (APA 1994), the following anxiety disorders can be distinguished in children and adolescents: separation anxiety disorder, generalised anxiety disorder, social phobia, specific phobia, panic disorder, obsessive-compulsive disorder (OCD), and post-traumatic or acute stress disorder.

Whether for research or clinical practice, self-report instruments for measuring childhood anxiety symptoms are frequently used as they are easy to administer and require a minimum of time to capture information about anxiety symptoms from the child's point of view (Muris *et al.* 2004). There are some instruments based on DSM-IV diagnoses of several anxiety disorders in children. Amongst others, these include the Multidimensional Anxiety Scale for Children (MASC) (March *et al*. 1997; March, Sullivan and Parker 1999) and the Screen for Child Anxiety Related Emotional Disorders – Revised (SCARED-R) (Muris *et al*. 2004).

Other tests, such as the Short Leyton Obsessional Inventory for Children and Adolescents, which approximate DSM-IV diagnosis for OCD have been developed for specific aspects of anxiety disorder in children and adolescents (Bamber *et al*. 2002). Recognition of these symptoms in children is important, as it has been estimated that at least 80% of adult cases of OCD start during childhood (Riddle 1998) and that the first peak of maximal incidence occurs between 12 and 14 years of age (Rasmussen and Tsuang 1986).

Community studies reported OCD prevalence ranges of 0–4% (Flament and Cohen 2000). For various reasons, OCD is however rarely detected in children, with reported delays of up to 17 years between the average onset age of OCD at 14.5 years and provision of adequate treatment (Hollander *et al.* 1996) — hence the need for early identification.

### *Depression symptoms and syndromes in children and adolescents in the community*

The prevalence of the full-fledged diagnosis of major depression among all children aged 9–17 has been estimated at 5% (Shaffer *et al.* 1996). Estimates of one-year prevalence in children range from 0.4–2.5%. In adolescents it is considerably higher (in some studies, as high as 8.3%) (Anderson and McGee 1994). For purposes of comparison, one-year prevalence in adults is about 5.3% (Murphy *et al.* 1988; Rorsman *et al.* 1990).

Depression among children and adults is common but frequently unrecognised. A growing body of evidence has confirmed that children and adolescents not only experience the whole spectrum of mood disorders, but also suffer from the significant morbidity and mortality associated with them. Suicide has become a growing public health concern as successive generations have shown a parallel increase of suicide and depression in the pediatric age group (Klerman *et al.* 1985; Jellinek and Snyder 1998).

The age of first onset of depression appears to play a role in its course. Children who first become depressed before puberty are at risk for some form of mental disorder in adulthood, while teenagers who first become depressed after puberty are most likely to experience another episode of depression (Harrington *et al.* 1990).

In the absence of data on the various types of anxiety symptoms and syndromes and depression symptoms, this study aims to document these as well as their prevalence rates in adolescents attending Nairobi public secondary schools.

## Methods, materials and instruments

### *The setting*

This was part of a broader study on mental health issues and associated factors that was conducted among secondary school students from 17 (34.7%) out of the 49 public secondary schools within

Nairobi, the capital city of Kenya. This stratified sample was categorised to be representative of all schools in terms of type of students it admits (national or provincial, explained below), gender (boys only/girls only/co-educational), whether students reside in school or not during school terms (boarding/day/mixed), geographical location of the school from the central part of the Nairobi city (east/west/north/south), and the neighbourhood economic class depending on rent costs (high/middle/low).

The school system in Kenya is such that after completing eight years in primary school those who qualify in their final examinations join secondary schools. The national schools enroll the top performers in the national examinations from schools all over the country through a quota system that ensures all eight administrative provinces (including Nairobi) are represented equally. The provincial schools only enroll students from schools within the city of Nairobi (which is also Nairobi province). They enroll the next-best performers who missed places in the national schools, provided they sat for the examinations in Nairobi. Ethnicity of the students was not enquired for as a previous census has shown that ethnicity is not an issue among Kenyan youth (Central Bureau of Statistics 2001). Furthermore, the Kenyan system does not, as a matter of policy, ask for information on ethnic background in any official documentation, except where one was born. The secondary school-going age in Kenya is 14–18 years, but one school offers vocational training for its former students. Depending on the part of the country students are admitted from, it is not unusual for children to start school by as much as 4–6 years late.

Those who gain admission to secondary schools would be the top scorers in English, among other subjects. English is the medium of instruction at primary, secondary and tertiary levels. All students in this study were therefore not only the top scorers, but were also fluent in both written and spoken English as their first language (also the language in which all questionnaires were administered). There was therefore no need for the questionnaires to be translated from English to any other language.

***Ethical issues and administration of the questionnaire***

Ethical clearance for the study was obtained from the Kenyatta National Ethics Committee and the Ministry of Education Science and Technology. Because of the logistical problems of reaching all the parents/guardians to give consent for participation in the study by their children at the same time, permission was granted by the Ministry of Education to seek the consent of head teachers on behalf of parents. There were no physically invasive procedures and the questions only touched on events related to the child and, in this particular set of instruments, only on symptoms of anxiety and depression. Head teachers of the different institutions were visited to be given an explanation of the study and to get their permission for the study to be conducted in their schools. They were all very receptive to the idea. By prior arrangement, each of the 17 sampled schools set out a particular time and a day when the questionnaires would be administered to the whole school. All the schools participated in the study within the same one week (Monday–Friday) in July when all the newcomers had settled in and there were still some months to the end of the school year school and national examinations. Every eighth student from Form one to Form four (and those in vocational training) at each of the 17 schools participated in completing the questionnaires; except those who were absent from school on that particular day. The first student in the row got the first set of questionnaires, the second student got the second set of questionnaires and so on till the eighth student got the eighth set of questionnaires. This sequence was repeated until all the students had received questionnaires. (In relation to all eight sets of questionnaires, the sets reported here were questionnaire number 5, 6 and 7; i.e. sets 1, 2 and 3, respectively).

The class teachers (research assistants) who had been trained by the principal investigator (PI) on confidentiality, participated in the distribution of the questionnaires when the whole class was seated (in their regular class positions). The roles of the class teachers were specified: distribution of each set of questionnaires to the students when all were seated at their usual desks; requesting the students to first read the instructions on the questionnaires before completing them; and showing the students the location of the ballot box. The questionnaires took 15–25 minutes to complete, including the time it took to read the instructions. The teacher provided information on

the total of number of students who were currently registered in the school and the number of those who were present/absent during the exercise.

The research assistant from the Africa Mental Health Foundation (AMHF) collected the ballot boxes from each class in the sampled schools and took them to the AMHF project administrator who ascribed a code to each of the 17 schools to ensure anonymity (schools' identities were only revealed to the PI after all the analysis was done). A description of each of the 17 schools could easily suggest their identity. It was therefore decided that there would be no description of the 17 schools in any subsequent public reports.

***Instruments used***

This was a multi-purpose study to investigate various aspects of psychological issues in students at Nairobi public schools using various instruments in different combinations, for various objectives. They were arranged in eight different sets of instruments for the purpose of studying the prevalence of anxiety and depression symptoms and syndromes. The following sets were used:

- **Set 1:** A socio-demographic questionnaire, the MASC, the Ndetei-Othieno-Kathuku (NOK) scale for symptoms of anxiety and depression, and the Child Depression Inventory (CDI);
- **Set 2:** A socio-demographic questionnaire, the CDI, the MASC and Short Leyton Obsessional Inventory for Children and Adolescents;
- **Set 3:** A socio-demographic questionnaire, SCARED-R and the NOK.

The following is a brief description of the different instruments that were used to constitute the three sets.

**Socio-demographic questionnaire** — Enquires about age, gender, type of school and whether the student is a boarder or day scholar. This was considered adequate for the aims of the study.

**Multidimensional Anxiety Scale for Children (MASC)** — The psychometric properties of the MASC have been described by March *et al.* (1997). It is a self-administered instrument consisting of 39 items rated on a four-point Likert scale indicating frequency of experiencing anxiety. It taps the following four dimensions of childhood anxiety: physical symptoms, social anxiety, separation anxiety and harm avoidance. These psychometrically-derived dimensions have been found consistently in normal and clinical samples (March, Sullivan and Parker 1999; March *et al.* 1997), and differentiate reasonably well between anxious children, normal children and children with other types of psychopathology (March *et al.* 1999). The four-factor structure of the MASC was also established in confirmatory factor analyses in a normal population of children between the ages of 8 and 17 (March *et al.* 1997). So far there are no published references on the psychometric properties of the MASC in African settings, although work is being done on this in Kenya and South Africa, with preliminary results for Kenya suggesting they are identical to those found on MASC in European countries.

**Screen for Child Anxiety Related Disorders – Revised (SCARED-R)** — This is a 66-item questionnaire for measuring a broad range of DSM-IV (APA 1994) defined anxiety disorder symptoms whose psychometric properties were reported by Muris *et al.* (2004), with the conclusion that the SCARED-R is a valuable additional set of questionnaires that are used for the assessment of anxiety in youth.

Muris *et al.* (2004) reviewed literature on previous studies on an earlier version of SCARED-R on normal school children which showed that it possessed adequate internal consistency, has sufficient test-retest stability, acceptable validity in that it correlates substantially with other childhood measures and discriminates between children with and without sub-clinical anxiety disorders. They concluded that SCARED-R was a reliable and valid questionnaire for assessment of childhood anxiety. Unlike MASC, whose subscales are syndromes of anxiety, SCARED-R gives DSM-IV diagnoses of the various types of anxiety disorders found in children.

**Short Leyton Obsessional Inventory for Children and Adolescents** — The psychometric properties of this instrument on a community sample of secondary schools was reported by Bamber *et al*. (2002). It is an 11-item cost-effective screening measure for OCD and discriminates OCD cases from non-cases, irrespective of co-morbid major depressive disorder.

According to DSM-IV criteria (APA 1994), students scoring 2–8 on the obsessive subscale have indication that they are developing obsessive features; while scores of 9-18 are diagnostic of obsessive disorder. On the compulsive subscale, students scoring 2–7 have indication that they are developing compulsive features; while scores of 8–10 are diagnostic of compulsive disorder. Scores of 4–16 are a pointer to development of OCD after computation of the scores of those students who scored 2 and above on both obsessive and compulsive subscales. Scores of 17–33 are diagnostic for OCD after computation of the scores of those students who scored 2 and above on obsessive and compulsive subscales.

**Child Depression Inventory (CDI)** — The CDI is intended to detect and evaluate major depressive disorders and dysthymic disorders in children and adolescents, and to distinguish between children with those disorders and children with other psychiatric conditions. The scale has 27 items relating to sadness, self blame, loss of appetite, interpersonal relationships and school adjustment. It was originally adapted from the Beck Depression Inventory (Kovacs and Beck 1977). The CDI can be administered repeatedly in order to measure changes in depression over time and to evaluate the results of treatment for depression disorder. It is regarded as adequate for assessing the severity of depression symptoms. The CDI has also been used in research studies for epidemiology of depression in children, as well as in studies on dissociate symptoms and post-traumatic syndromes in children. It has been rated as having adequate to excellent psychometric properties and has repeatedly been shown to be a valid screen for depressive symptoms in children and adolescents (Kovacs 1985; Laor and Wolmer 1996). A total CDI score is calculated by adding all items that vary between 0 (no depression) and 54 (all depression symptoms clearly present).

Petersen *et al.* (2004) set out to study inpatient children and report on the congruence of a clinician's DSM-IV diagnosis versus the CDI (a patient-administered scale) versus the parent's report of depression. The sample comprised 111 children aged 5–15 years admitted at the Child Psychiatry unit of Pennsylvania State College of Medicine. Of the total number of children, 63 (56.8%) had a DSM-IV diagnosis (APA 1994) of depression and 48 (43.2%) did not complete the CDI. It was found that the CDI scores differed significantly ($p < 0.001$) between children with depression and children without depression. Positive and negative powers were high (79% and 61%). Within the depressed group, percent agreement for depression was 81% for the child psychiatrist and child, and 81% for the psychiatrist and parent. Petersen *et al.* (2004) concluded that the CDI was a valuable instrument in the inpatient assessment of children and a good predictor of depressive diagnosis. They suggested a cut-off of 12 in clinical assessment in inpatient populations and 17 for the general population (the CDI has 27 items rated on a 3-point Likert scale).

**Ndetei-Othieno-Kathuku (NOK) Scale for Depression and Anxiety** — The NOK (Dech *et al.* 1996; Sandermann *et al.* 1996) was developed to measure the symptoms that people with emotional problems present with in the Kenyan socio-cultural setting. These symptoms constitute the felt and expressed symptoms for which people with mild anxiety and depression seek help. It was developed in the same pattern as most other instruments are developed, as detailed by Snaith, Bridge and Hamilton (1976) in their description of the development of the Wakefield Self rating Scale for Anxiety and Depression.

The items of the NOK are derived from a collection of the symptoms based on the complaints of people with anxiety and depression when they present at healthcare facilities. All the questions are culturally appropriate and were subjected to statistical analysis against gold standard DSM-IV and ICD-10 derived diagnostic instruments for anxiety and depression, as well as against the Hamilton Depression Scale.

The psychometric properties of the NOK have recently been documented (Ndetei *et al.* 2006) and the cut-off point has been put at 20. The scores are divided into several categories: Normal = <19, Mild = 20–47, Moderate = 48–75 and Severe = >75. The NOK was therefore considered appropriate for this study.

***Psychometric properties of the instruments as used on the students in this study***

These are summarised in Appendices 1 and 2.

*Alpha coefficients (Appendix 1)*

- SCARED-R overall had strong psychometric properties, but it had weak properties on some anxiety disorders, particularly obsession and compulsions, specific phobia for animal and specific phobia for medical
- NOK had strong properties.
- CDI scores under 27 need further screening to rule out dysthymia. The instrument is therefore not reliable in making a diagnosis of dysthymia in a community survey. It has low alpha co-efficient (Appendix 1). CDI scores over 27 are diagnostic for moderate to severe depressive illness when screening youths in the community. The instrument therefore has high reliability value when screening clinically significant youth in the community.
- Obsessive disorders and compulsive disorders considered separately each had weak properties, a reflection of similarly poor properties in the obsessive-compulsive component of the SCARED-R. However, when both obsessive and compulsive disorders are considered together in combination, then the properties improve.
- The MASC had strong overall properties, with the exception of the harm avoidance subscale.

*Correlations between instruments (Appendix 2)*

All the MASC subscales (except harm reduction) correlated with CDI, NOK and OCD.

***Data analysis***

Analysis was done using the SPSS version 11.5 software. Descriptive statistics of the socio-demographic characteristics of the respondents were generated. Frequency tables of the respondents' scores on each of the instruments were produced. Sample sizes vary for different variables because there were differences in the number of responses for each of the three sets of questionnaires that were distributed. The statistical measures that were performed included tests of internal consistency reliability and the Pearson's Product Moment correlation.

## Results

A total of 1 275 (for Set 1), 1 279 (for Set 2) and 1 221 (for Set 3) (total 3 775) questionnaires were distributed and all were returned completed. It took 15–20 minutes to complete the questionnaires. Table 1 compares socio-demographic data obtained from the three sets of questionnaires to illustrate the similarities of the groups.

***The MASC***

Taking only the definitive clinical level syndromes into consideration, harm avoidance was the commonest (81.5%), followed by social anxiety (80.0%), and then separation anxiety (panic) at 11.2%. Physical anxiety scored lowest at 1.7%. The overall MASC score for a definitive anxiety was 12.9%. The cut-off points for normal, needing further screening and a diagnosis of its various syndromes are summarised in Table 2.

***The SCARED-R Syndromes***

Clinical separation anxiety and school phobia disorders were found in all the patients who responded to the respective questions, closely followed by OCD at 99.3%. The lowest score was in specific phobia for animals (54.7%). The cut-off scores for 'normal', 'need for further screening' and 'positive diagnosis for various types of anxiety disorders' are summarised in Table 3.

Some individual symptoms had means of ≥2 (range 0–3). These were in the following syndromes (with 'often' prevalence in brackets and the hash sign referring to the specific item number on the SCARED-R list of symptoms):

- Panic disorder syndromes
  – When frightened my heart beats fast (# 32) — mean 2.52 (64.5%)

- Generalised anxiety syndromes
  - I worry about things working out for me (# 38) — mean 2.06 (31.9%)
  - I worry about the future (# 55) — mean 2.25 (43.6%)
  - I worry about how I do things (# 57) — mean 2.12 (36.0%)
- Obsession and compulsion
  - I want that things are in a fixed order (# 6) — mean 2.46 (59.1%)
  - I do things more than twice in order to check whether I did it right (# 24) — mean 2.17 (36.4%)
  - I want things to be clean and tidy (# 26) — mean 2.55 (67.2%)
  - I have thoughts that I prefer not to have (# 62) — mean 2.09 (30.8%).
- Social phobia
  - I don't like to be with unknown people (# 4) — mean 2.07 (32.8%)
- Separation anxiety
  - I don't like being away from my family (# 50) — mean 2.03 (29.4%)
- Specific phobia medical
  - I am afraid to get a serious disease (# 34) — mean 2.37 (57.7%).
  - I don't like being in a hospital (# 66) — mean 2.05 (38.2%)

**Table 1:** Socio-demographic data from three sets of questionnaires (illustrating similarities of groups)

| | Sample 1 MASC, NOK & CDI[1] *n* (%) | Sample 2 CDI, MASC & OCD[2] *n* (%) | Sample 3 SCARED & NOK[3] *n* (%) |
|---|---|---|---|
| **Gender** | | | |
| Male | 805 (63.1) | 742 (58.0) | 687 (56.3) |
| Female | 470 (36.9) | 537 (42.0) | 534 (43.7) |
| **Total** | **1 275 (100.0)** | **1 279 (100.0)** | **1 221 (100.0)** |
| **Type of attendance** | | | |
| Boarding | 938 (73.6) | 1013 (79.2) | 1058 (87.7) |
| Day student | 337 (26.4) | 266 (20.8) | 163 (13.3) |
| **Total** | **1 275 (100.0)** | **1 279 (100.0)** | **1 221 (100.0)** |
| **Classes** | | | |
| Form 1 | 313 (24.6) | 331 (25.9) | 310 (25.4) |
| Form 2 | 373 (29.3) | 353 (27.6) | 336 (27.5) |
| Form 3 | 289 (22.7) | 312 (24.4) | 309 (25.3) |
| Form 4 | 297 (23.3) | 283 (22.1) | 266 (21.8) |
| **Total** | **1 272 (100.0)*** | **1 279 (100.0)** | **1 221 (100.0)** |
| **Age**** | | | |
| 13 | 1 (0.1) | 1 (0.1) | 1 (0.1) |
| 14 | 35 (4.2) | 40 (4.6) | 60 (6.4) |
| 15 | 175 (21.1) | 160 (18.3) | 189 (20.2) |
| 16 | 194 (23.4) | 211 (24.1) | 235 (25.1) |
| 17 | 204 (24.6) | 203 (23.2) | 214 (22.9) |
| 18 | 150 (18.1) | 196 (22.4) | 174 (18.6) |
| 19 | 43 (5.2) | 48 (5.5) | 40 (4.3) |
| 20 | 18 (5.2) | 12 (1.4) | 16 (1.7) |
| 21+ | 8 (3.0) | 3 (0.3) | 6 (0.6) |
| **Total** | **828 (100.0)** | **874 (100.0)** | **935 (100.0)** |

[1] Students in sample 1 responded to MASC, NOK and CDI

[2] Students' results in sample 2 responded to CDI, MASC and OCD

[3] Students' results in sample 3 responded to SCARED-R and NOK

* Three students in sample 1 did not provide information on which classes they were in

** For those who responded to the question on 'age'

Results show that students were selected randomly (even distributions across the socio-demographic characteristics)

**Table 2:** Multidimensional Anxiety Scale for Children (MASC) scores according to age, *n* (%)*

| Category | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| **Physical** | | | | | | | | | | | | | | | |
| 0–7: Normal | 5 (31.3) | 4 (16.0) | 33 (43.4) | 28 (33.3) | 45 (36.3) | 22 (25.3) | 60 (45.1) | 17 (24.3) | 47 (43.1) | 32 (36.8) | 21 (42.0) | 1 (10.0) | 1 (25.0) | – | 316 (36.1) |
| 8–25: Further screening | 10 (62.5) | 19 (76.0) | 43 (56.6) | 55 (65.5) | 78 (62.9) | 62 (71.3) | 68 (51.1) | 52 (74.3) | 62 (56.9) | 54 (62.1) | 29 (58.0) | 9 (90.0) | 3 (75.0) | 1 (100.0) | 545 (62.2) |
| 26–36: Physical anxiety | 1 (6.3) | 2 (8.0) | – | 1 (1.2) | 1 (0.8) | 3 (3.4) | 5 (3.8) | 1 (1.4) | – | 1 (1.1) | – | – | – | – | 15 (1.7) |
| **Social** | | | | | | | | | | | | | | | |
| 0–2: Normal | – | – | – | 3 (3.6) | 8 (6.5) | 4 (4.6) | 1 (0.8) | 4 (5.7) | 5 (4.6) | 1 (1.1) | 4 (8.0) | – | – | – | 30 (3.4) |
| 3–7: Further screening | 1 (6.3) | 2 (8.0) | 12 (15.8) | 9 (10.7) | 18 (14.5) | 10 (11.5) | 26 (19.5) | 9 (12.9) | 20 (18.3) | 22 (25.3) | 12 (24.0) | 4 (40.0) | – | – | 145 (16.6) |
| 8–27: Social anxiety | 15 (93.8) | 23 (92.0) | 64 (84.2) | 72 (85.7) | 98 (79.0) | 73 (83.9) | 106 (79.7) | 57 (81.4) | 84 (77.1) | 64 (73.6) | 34 (68.0) | 6 (60.0) | 4 (100.0) | 1 (100.0) | 701 (80.0) |
| **Separation (panic)** | | | | | | | | | | | | | | | |
| 0–5: Normal | 3 (18.8) | 4 (16.0) | 30 (39.5) | 14 (16.7) | 53 (42.7) | 17 (19.5) | 67 (50.4) | 19 (27.1) | 45 (41.3) | 23 (26.4) | 20 (40.0) | 3 (30.0) | 2 (50.0) | – | 300 (34.2) |
| 6–16: Further screening | 12 (75) | 15 (60.0) | 39 (51.3) | 57 (67.9) | 61 (49.2) | 53 (60.9) | 59 (44.4) | 42 (60.0) | 54 (49.5) | 52 (59.8) | 26 (52.0) | 6 (60.0) | 2 (50.0) | – | 478 (54.6) |
| 17–27: Separation anxiety (panic) | 1 (6.3) | 2 (24.0) | 7 (9.2) | 13 (15.5) | 10 (8.1) | 17 (19.5) | 7 (5.3) | 9 (12.9) | 10 (9.2) | 12 (13.8) | 4 (8.0) | 1 (10.0) | – | 1 (100.0) | 98 (11.2) |
| **Harm avoidance** | | | | | | | | | | | | | | | |
| 0–7: Normal | 2 (12.5) | – | 2 (2.6) | 4 (4.8) | 4 (3.2) | 3 (3.4) | 5 (3.8) | 3 (4.3) | 3 (2.8) | 4 (4.6) | 1 (2.0) | – | – | – | 31 (3.5) |
| 8–12: Further screening | 2 (12.5) | 1 (4.0) | 8 (10.5) | 12 (14.3) | 22 (17.7) | 13 (14.9) | 15 (11.3) | 12 (17.1) | 25 (22.9) | 12 (13.8) | 7 (14.0) | – | 2 (50.0) | – | 131 (15) |
| 13–24: Harm avoidance | 12 (75.0) | 42 (96.0) | 66 (86.8) | 68 (81.0) | 98 (79.0) | 71 (81.6) | 113 (85.0) | 55 (78.6) | 81 (74.3) | 71 (81.6) | 42 (84.0) | 10 (100.0) | 2 (50.0) | 1 (100.0) | 714 (81.5) |
| **Total MASC score** | | | | | | | | | | | | | | | |
| 0–27: Normal | 1 (6.3) | – | 5 (6.6) | 5 (6) | 13 (10.5) | 6 (6.9) | 15 (11.3) | 6 (8.6) | 9 (8.3) | 7 (8) | 7 (14.0) | – | 3 (75.0) | – | 74 (8.4) |
| 28–64: Further screening | 14 (87.5) | 17 (68.0) | 63 (82.9) | 62 (73.8) | 102 (82.3) | 62 (71.3) | 105 (78.9) | 51 (72.9) | 92 (84.4) | 72 (82.8) | 39 (78.0) | 6 (60.0) | 1 (25.0) | 1 (100.0) | 689 (78.7) |
| >64: Harm avoidance | 1 (6.3) | 8 (32.0) | 8 (10.5) | 17 (20.2) | 9 (7.3) | 19 (21.8) | 13 (9.8) | 13 (18.6) | 8 (7.3) | 8 (9.2) | 4 (8.0) | 4 (40.0) | 1 (25.0) | – | 113 (12.9) |

* The last column labelled 'All' represents data for all children who completed the questionnaires, including those who did not indicate their ages

**Table 3:** Screen for Child Anxiety Related Emotional Disorders – Revised (SCARED-R) results according to age, *n* (%)*

| Anxiety disorder | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| **Panic attack** | | | | | | | | | | | | | | | |
| 0–3: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4–13: Mild (need further screening) | 0 | 0 | 1 (1.1) | 1 (1.0) | 2 (1.6) | 0 | 2 (1.7) | 4 (4.4) | 3 (3.0) | 0 | 1 (2.0) | 0 | 1 (20) | 0 | 8 (1.9) |
| 14–39: Diagnostic | 29 (100.0) | 31 (100.0) | 87 (98.9) | 98 (99.0) | 125 (98.4) | 105 (100.0) | 117 (98.3) | 87 (95.6) | 97 (97.0) | 74 (100.0) | 48 (98.0) | 6 (100.0) | 4 (80.0) | 1 (100.0) | 917 (98.1) |
| **Generalised anxiety disorder** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–9: Need further screening | 2 (6.9) | 0 | 1 (1.2) | 0 | 3 (2.4) | 0 | 1 (0.8) | 1 (1.1) | 2 (2.0) | 0 | 2 (4.2) | 0 | 0 | 0 | 18 (1.9) |
| 10–27: Diagnostic | 27 (93.1) | 31 (100.0) | 85 (98.8) | 101 (100.0) | 123 (97.6) | 106 (100.0) | 118 (99.2) | 93 (98.9) | 98 (98.0) | 74 (100.0) | 46 (95.8) | 7 (100.0) | 5 (100.0) | 1 (100.0) | 917 (98.1) |
| **Separation anxiety disorder** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–3: Need further screening | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4–24: Diagnostic | 29 (100.0) | 31 (100.0) | 88 (100.0) | 101 (100.0) | 127 (100.0) | 106 (100.0) | 119 (100.0) | 94 (100.0) | 97 (100.0) | 74 (100.0) | 48 (100.0) | 7 (100.0) | 5 (100.0) | 1 (100.0) | 935 (100.0) |
| **School phobia** | | | | | | | | | | | | | | | |
| 0: Normal | 24 (82.8) | 17 (53.1) | 58 (65.9) | 40 (39.6) | 73 (57.0) | 37 (34.6) | 64 (53.8) | 26 (27.4) | 49 (49.0) | 19 (25.7) | 25 (51.0) | 3 (42.9) | 3 (60.0) | 1 (100.0) | 439 (47.0) |
| 1–3: Need further screening | 3 (10.3) | 12 (37.5) | 23 (26.1) | 48 (47.5) | 39 (30.5) | 51 (47.7) | 41 (34.4) | 41 (43.2) | 37 (37.0) | 34 (46.0) | 16 (32.7) | 4 (57.1) | 0 | 0 | 349 (37.3) |
| 4–12: Diagnostic | 2 (6.9) | 3 (9.4) | 7 (8.0) | 13 (12.9) | 16 (12.5) | 19 (17.8) | 14 (11.8) | 28 (29.5) | 14 (14.0) | 21 (28.4) | 8 (16.3) | 0 | 2 (40.0) | 0 | 147 (15.7) |
| **Social phobia** | | | | | | | | | | | | | | | |
| 0–2: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3–5: Need further screening | 3 (10.3) | 1 (3.2) | 4 (4.5) | 7 (6.1) | 20 (16.0) | 16 (15.1) | 20 (16.9) | 17 (19.1) | 21 (21.6) | 6 (8.1) | 11 (22.9) | 0 | 1 (20.0) | 0 | 131 (14.0) |
| 6–12: Diagnostic | 26 (89.7) | 30 (96.8) | 84 (95.5) | 94 (93.1) | 105 (84.0) | 90 (84.9) | 98 (83.1) | 77 (81.9) | 76 (78.4) | 68 (91.9) | 37 (77.1) | 7 (100.0) | 4 (80.0) | 1 (100.0) | 804 (86.0) |

**Table 3:** (cont.)

| Anxiety disorder | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| **Obsessive-compulsive** | | | | | | | | | | | | | | | |
| 0–2: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3–9: Need further screening | 0 | 0 | 0 | 0 | 1 (0.8) | 0 | 0 | 0 | 1 (1.0) | 0 | 0 | 0 | 0 | 0 | 7 (0.7) |
| 10–27: Diagnostic | 29 (100.0) | 31 (100.0) | 87 (100.0) | 101 (100.0) | 123 (99.2) | 106 (100.0) | 118 (100.0) | 94 (100.0) | 96 (99.0) | 74 (100.0) | 48 (100.0) | 7 (100.0) | 5 (100.0) | 1 (100.0) | 928 (99.3) |
| **Post-traumatic stress disorder** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–4: Exposed to traumatic events | 3 (11.1) | 3 (9.3) | 11 (12.7) | 13 (13.1) | 26 (21.0) | 19 (17.9) | 21 (17.8) | 21 (22.6) | 23 (23.7) | 17 (23.0) | 11 (22.9) | 0 | 2 (40.0) | 0 | 174 (18.6) |
| 5–12: Diagnostic | 24 (88.9) | 28 (90.3) | 75 (87.2) | 86 (86.9) | 98 (79.0) | 87 (82.1) | 97 (82.2) | 72 (77.4) | 74 (76.3) | 57 (77.0) | 37 (77.1) | 7 (100.0) | 3 (60.0) | 1 (100.0) | 761 (81.4) |
| **Specific phobia (animals)** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–3: Need further screening | 13 (48.1) | 7 (22.6) | 37 (43.5) | 39 (39.4) | 64 (51.6) | 30 (28.3) | 63 (53.4) | 39 (41.9) | 62 (63.9) | 32 (43.2) | 24 (50.0) | 1 (14.3) | 4 (80.0) | 1 (100.0) | 424 (45.3) |
| 4–9: Diagnostic | 14 (51.9) | 24 (77.4) | 48 (56.5) | 60 (60.6) | 60 (48.4) | 76 (71.7) | 55 (46.6) | 54 (58.1) | 35 (36.1) | 42 (56.8) | 24 (50.0) | 6 (85.7) | 1 (20.0) | 0 | 511 (54.7) |
| **Specific phobia (medical)** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–7: Need further screening | 2 (7.7) | 2 (6.7) | 3 (3.5) | 4 (4) | 3 (2.4) | 3 (2.8) | 5 (4.2) | 5 (5.4) | 2 (2.1) | 4 (5.4) | 1 (2.1) | 1 (14.3) | 0 | 1 (100.0) | 39 (4.2) |
| 8–21: Diagnostic | 24 (92.3) | 28 (93.3) | 83 (96.5) | 95 (95.6) | 121 (97.6) | 103 (97.2) | 113 (95.8) | 87 (84.6) | 95 (97.9) | 70 (94.6) | 47 (97.9) | 6 (85.7) | 5 (100.0) | 0 | 896 (95.8) |
| **Specific phobia (situational/environmental)** | | | | | | | | | | | | | | | |
| 0: Normal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1–5: Need further screening | 2 (7.7) | 2 (6.7) | 6 (7.0) | 5 (5.1) | 17 (13.7) | 6 (5.7) | 10 (8.5) | 7 (7.6) | 11 (11.3) | 3 (4.1) | 4 (8.3) | 0 | 2 (40.0) | 0 | 81 (8.7) |
| 6–15: Diagnostic | 24 (92.3) | 28 (9.3) | 80 (93.0) | 94 (94.9) | 107 (86.3) | 100 (94.3) | 108 (91.5) | 85 (92.4) | 86 (88.7) | 71 (95.9) | 44 (91.7) | 7 (100.0) | 3 (60.0) | 1 (100.0) | 854 (91.3) |

* The last column labelled 'All' represents data for all children who completed the questionnaires, including those who did not indicate their ages

### *Obsessive-compulsive subscales and disorder*

These findings are summarised in Table 4. Of those who completed the second set of questionnaires, clinical obsession disorder was found in 40.7%, compulsive disorder in 81.1% and OCD in 69.1%. The results of the study indicate that the majority of the students have OCD (see Table 4).

### *The CDI*

The different scores and cut-off points and their interpretation are summarised in Table 5. Of the total, 25.7% scored for clinical depression.

### *The NOK*

The results for this are summarised in Table 6. The current NOK is not designed to make any DSM-IV diagnosis, but is instead a screening test for general emotional pathology. Of the total, 4.8% had severe such pathology and 44.5% moderate pathology.

## Discussion

The psychometric instruments used, with the exception of NOK, have been validated against DSM-IV respective diagnostic criteria in Western countries where they have been used extensively for similar surveys as they were used in this study. The NOK was developed in the Kenyan socio-cultural context to capture the symptoms of patients who presented with mild psychological disorders and then the instrument was validated against the DSM-IV and ICD-10 as reviewed in the literature. The psychometric properties of the other instruments have however not been documented in the Kenyan socio-cultural context. Using the data generated through this study, the alpha coefficients revealed strong properties for MASC, SCARED-R and the NOK, but less strong properties for the CDI and the Leyton's Symptoms Check list for OCD (Appendix 1).

The correlations (summarised in Appendix 2) between MASC and NOK and between SCARED-R and NOK were significant. All the MASC subscales (except 'harm avoidance') correlated significantly with OCD, but the correlations were negative, suggesting that the two scales measured different conditions and therefore that OCD may not be an anxiety disorder as measured by MASC.

Only limited socio-demographic data was obtained for the purposes of this study. Age and sex were considered the most important factors as the purpose of this study was to establish the prevalence of anxiety and depressive disorders in the specified population. The three sets of socio-demographic data show that the three samples obtained from the same populations were similar.

### *Population studied*

The specific population studied is not only representative of the adolescents in public schools in Nairobi, but also to some extent of adolescents in Kenya, as the students had representation from all parts of the country because of their selection through a quota system. Nairobi happens to have the majority of all national schools in Kenya. The age- and sex-specific data for the range of 13–21 years gives vital information for the different ages and sex.

### *Anxiety symptoms and syndromes*

When the clinically significant pathology was considered, 12.9% of the sampled population had anxiety using the MASC. There was however great variation in the subscales with the lowest prevalence on physical anxiety (1.7%). Social anxiety for clinical pathology at 80% prevalence is not surprising, given the high level of bullying reported in the same schools (Ndetei *et al*. 2007). However, the 12.9% prevalence is similar to that obtained in various studies in the West, as reviewed by Berstein *et al*. (1996).

The SCARED-R, which measures various DSM-IV-derived anxiety disorders, produced high prevalences of various specific anxiety disorders with a range of 85–100% (except for specific phobia for animals at 54.7%). It may be that this instrument is more appropriate for screening than diagnostic purposes, at least in this Kenyan population. However, some of the symptoms reported among high school students could be regarded as perfectly normal symptoms, like 'when

**Table 4:** Scores for obsession, compulsion and obsessive-compulsive disorder (OCD) according to age, *n* (%)*

| | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| **Obsessive** | | | | | | | | | | | | | | | |
| 0–1: Normal | – | – | 1 (1.3) | 3 (3.6) | 5 (4.0) | 2 (2.3) | 2 (1.5) | 4 (5.7) | 1 (0.9) | – | – | – | – | – | 25 (2) |
| 2–9: Mild | 10 (62.5) | 13 (52) | 40 (52.6) | 46 (54.8) | 78 (62.8) | 52 (59.8) | 72 (54.1) | 34 (48.6) | 64 (58.7) | 49 (56.3) | 32 (64.0) | 6 (60.0) | 3 (75.0) | 1 (100) | 734 (57.4) |
| >10: Obsessive disorder | 6 (37.5) | 12 (48.0) | 35 (46.1) | 35 (41.7) | 41 (33.1) | 33 (37.9) | 59 (44.4) | 32 (45.7) | 44 (40.4) | 38 (43.7) | 18 (36.0) | 4 (40.0) | 1 (25.0) | – | 520 (40.7) |
| **Compulsive** | | | | | | | | | | | | | | | |
| 0–1: Normal | – | – | – | – | 1 (0.8) | – | 2 (1.5%) | 1 (1.4) | – | – | – | – | – | – | 12 (0.9) |
| 2–7: Mild | 5 (31.3) | 4 (16) | 13 (17.1) | 14 (16.7) | 20 (16.1) | 16 (18.4) | 16 (12.0) | 9 (12.9) | 21 (19.3) | 16 (18.4) | 7 (14.0) | 3 (30.0) | 3 (75.0) | – | 230 (18.0) |
| 8–15: Compulsive disorder | 11 (68.8) | 21 (84) | 63 (82.9) | 70 (83.3) | 103 (83.1) | 71 (81.6) | 115 (86.5) | 60 (85.7) | 88 (80.7) | 71 (81.6) | 43 (86.0) | 7 (70.0) | 1 (25.0) | 1 (100.0) | 1 027 (81.1) |
| **OCD** | | | | | | | | | | | | | | | |
| 0–3: Normal | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 4–16: Mild | 5 (33.3) | 8 (33.3) | 20 (28.6%) | 21 (25.9) | 39 (32.8) | 32 (39.5) | 32 (26.2) | 12 (19.7) | 37 (37.0) | 24 (28.9) | 15 (31.9) | 4 (40.0) | 4 (100.0) | – | 253 (30.9) |
| >17: OCD | 10 (66.7) | 16 (66.7) | 50 (71.4%) | 60 (74.1) | 80 (67.2) | 49 (60.5) | 90 (73.8) | 49 (80.3) | 63 (63.0) | 59 (71.1) | 32 (68.1) | 6 (60.0) | – | 1 (100.0) | 565 (69.1) |

* The last column labelled 'All' represents data for all children who completed the questionnaires, including those who did not indicate their ages

**Table 5:** Children's Depression Inventory (CDI) scores according to age, *n* (%)

| CDI | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| 0–16: No depressive | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 17–27: Need further screening | 4 (40.0) | 14 (77.7) | 131 (68.2) | 46 (78.0) | 69 (70.4) | 36 (57.1) | 57 (64.0) | 54 (66.7) | 60 (63.2) | 25 (78.1) | 21 (60.0) | 6 (75.0) | 2 (50.0) | 1 (100.0) | 526 (67.0) |
| > 27: Depressive | 6 (60.0) | 4 (22.2) | 61 (31.8) | 13 (22.0) | 29 (29.6) | 27 (42.9) | 32 (36.0) | 27 (33.3) | 35 (36.8) | 7 (21.9) | 14 (40.0) | 2 (25.0) | 2 (50.0) | – | 259 (33.0) |
| Mean scores | 28.6 | 25.8 | 25.7 | 25.8 | 25.7 | 25.6 | 25.6 | 25.7 | 25.6 | 25.8 | 25.6 | 25.7 | 25.5 | 27 | 25.7 |
| 41–54: Severe (Depression illness) | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| Total | 10 (100.0) | 18 (100.0) | 192 (100.0) | 59 (100.0) | 98 (100) | 63 (100.0) | 89 (100.0) | 81 (100.0) | 95 (100.0) | 32 (100.0) | 35 (100.0) | 8 (100.0) | 4 (100.0) | 1 (100.0) | 785 (100.0) |

**Table 6:** Ndetei-Othieno-Kathuku (NOK) scale scores according to age, *n* (%)

| NOK | Ages 13–14 | | Age 15 | | Age 16 | | Age 17 | | Age 18 | | Ages 19–20 | | Ages 21+ | | All |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| 0–19: Normal *n* = 1 814 | – | – | – | – | – | – | – | – | – | – | 1 (2.9) | – | – | – | 1 (0.1) |
| 20–49: Mild *n* = 437 | 38 (50.7) | 10 (37.0) | 38 (50.7) | 43 (53.1) | 67 (63.2) | 50 (55.6) | 47 (50) | 40 (51.3) | 43 (50.0) | 23 (34.8) | 12 (35.3) | 3 (50.0) | 2 (66.7) | – | 388 (50.5) |
| 50–70: Moderate *n* = 80 | 34 (45.3) | 14 (51.9) | 34 (45.3) | 38 (46.9) | 37 (34.9) | 37 (41.1) | 43 (45.7) | 30 (38.5) | 38 (44.2) | 40 (60.6) | 17 (50.0) | 2 (33.3) | – | – | 342 (44.5) |
| >71: Severe *n* = 16 | 3 (4.0) | 3 (11.1) | 3 (4.0) | – | 2 (1.9) | 3 (3.3) | 4 (4.3) | 8 (10.3) | 5 (5.8) | 3 (4.5) | 4 (11.8) | 1 (16.7) | 1 (33.3) | – | 37 (4.8) |

frightened my heart beats fast' or 'I don't like to be with unknown people'. These high scores would not be surprising in situations where there is high prevalence of bullying and violent traumatic events. A summary of these normal symptoms that could have accounted for the high scores on the SCARED-R are summarised in the Results section of this paper. The SCARED-R is a relatively new anxiety instrument whose psychometric properties are yet to be reported outside the original study by its authors.

***OCD***

Though traditionally regarded as an anxiety disorder, this will be discussed separately.

The MASC correlated negatively ($p < 0.001$) with the OCD questionnaire, suggesting that these two instruments do not measure the same phenomenon. It was only harm avoidance on the MASC that, though negative, did not reach a significant level. The tradition of regarding OCD as an anxiety disorder is therefore questionable. It is not surprising that OCD sufferers respond to anti-depressants rather than to anxiolytics.

Harm avoidance — perfection (a trait of an obsessive-compulsive disorder) was at 81.5% on the MASC and OCD at 99.3% on the SCARED-R. In the case of the SCARED-R, some of the symptoms that contributed to high scores on the OCD could be regarded as normal for children who are subjected to a routine way of doing things in a school environment, more so in a boarding school, where obedience to school rules is not only a must but strictly enforced (these are summarised under Results).

This trend of high prevalence of obsession-compulsive symptoms and syndromes and OCD is repeated using a scale only for OC symptoms. There was a prevalence of 40.7% clinical pathology for obsession disorder, 81.1% for compulsive disorder and 69.1% for both OCDs. Although some but not all of the symptoms could be explained, as already discussed, the presence of OC symptoms cannot be ignored in African children. This is despite the fact that they are rarely recognised in routine clinical practice.

This apparently high prevalence of obsessive and compulsive disorders in this age group could be a reflection of the first peak of maximal incidence of OC symptoms at ages 12–14 (Rasmussen and Tsuang 1986) reported in Western settings. This is an important finding, especially on OC symptoms and syndromes in clinical situations, since these traits are likely to be carried to adulthood where they present as OCD (Rasmussen and Tsuang 1986).

***Depression symptoms***

The high prevalence of clinical depression at 25.7% on CDI is much higher than the 0.4–8.3% reported in Western settings (Anderson and McGee 1994). The most likely explanation for this is the relatively weak psychometric properties of the CDI in this population, despite strong psychometric properties (including validity) reported in Western studies. This calls for further psychometric studies on the CDI and other instruments for depression in Kenya and similar contexts, as documentation on depression in children is clearly important.

This notwithstanding, 4.8% and 5.5% of the students surveyed had suicidal thoughts and plans, respectively, on the CDI list of symptoms. These two symptoms of CDI are strongly indicative of depression and cannot be wished away on grounds of weak psychometrics of CDI in this Kenyan context. Their prevalence is within the 0.4–8.3% prevalence of depression reported in Western settings (Anderson and McGee 1994) and therefore a good indicator that depression is at least as common in Kenyan children as in the West. Apart from the risks of suicide being clearly indicated in this study, depressive symptoms in these adolescents are of concern since it has been shown that children who first become depressed before puberty are at risk of some form of mental disorders, while teenagers who first become depressed after puberty are most likely to experience another episode of depression (Harrington *et al*. 1990).

The NOK (Dech *et al.* 1996; Sandermann *et al.* 1996), with strong properties and good correlations with both MASC and SCARED-R (which was designed to pick up culturally expressed emotional symptoms), scored 4.8%, on the extreme prevalence, with a range of 1.9–11.8 prevalence in the 13–18-year age group. This is similar to the MASC range of 6.3–21.8 in the

13–18-year age group, but lower than the MASC overall score of 12.9. The psychometric properties of the NOK are still being studied.

These first ever baseline data and findings for the region and Kenya in general have limitations. The psychometric properties of the instruments used have not been adequately studied and documented. This is a reflection of a serious handicap in epidemiological studies in countries using instruments developed in Western settings. A priority area of mental health research in developing countries is the development of appropriate psychometric instruments, including adaptation of those developed and perfected in Western countries (including the DSM-IV). Another limitation of this study is that the findings can only be related to public secondary schools, although this is mitigated by the fact that the whole country was represented in the national schools through the quota system.

Despite these limitations, the large numbers of students taking part in this study (some of the largest samples ever reported) and the detailed sex and age range from 13–28 years, give the results strong significance. The findings therefore provide strong baseline data for future and better studies, depending on the sex- or age-specific focus of interest. An incidental finding of this study, besides the need to do further research on psychometrics in the region, is that OCD, though highly prevalent like other disorders, may not fit best under anxiety disorders. This needs further study.

The findings of the study do illustrate the prevalence of major psychological syndromes and disorders in an otherwise 'normal' population and within an age group that would normally not complain but rather quietly struggle to excel in a culture where excelling in schools is regarded as the only path to success (not only individually, but also on the behalf of families who may have invested everything on a child's education for economic investment and prestige). These children rarely express their symptoms, either for lack of a forum to do so or out of ignorance on what to make of their feelings.

Besides the need for further research on psychometrics and epidemiology, these results suggest the implementation of several policies:

- A deliberate policy that ensures inputs on child and adolescent mental health for all medical and paramedical personnel.
- A policy that is proactive in the identification of mental health problems in uncomplaining children.
- A policy that puts in place appropriate preventive and clinical interventions and facilities. In particular, a policy should be in place in schools for the identification of and intervention among children with mental problems, a role that is best played by resident school counsellors. This is more so since these results clearly indicate that these problems exist right at the earlier ages of secondary school entry (and by retrospective projection in primary school before joining secondary schools) and continue and change in pattern across the whole spectrum of secondary school education. Of particular interest for a proactive enquiry is suicide-related symptoms.
- In view of the large numbers involved, there should be simple self-administered screening tests in place to facilitate the identification of children who need further assessment.

## Conclusion

There is a high level of anxiety and depression disorders in the population study. This calls for appropriate clinical practice and policies. (Note: The full NOK instrument can be obtained on request from the PI.)

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**Appendix 1:** Alpha coefficients for SCARED-R, NOK, CDI, MASC and OCD

| | Boys | | Girls | | All | |
|---|---|---|---|---|---|---|
| | Results | Standardisation | Results | Standardisation | Results | Standardisation |
| 1. Panic disorder | 0.83 | 0.82 | 0.80 | 0.83 | 0.83 | 0.84 |
| 2. Generalised anxiety | 0.80 | 0.81 | 0.86 | 0.86 | 0.81 | 0.81 |
| 3. Obsession and compulsions | 0.54 | 0.56 | 0.65 | 0.65 | 0.49 | 0.50 |
| 4. School phobia | 0.79 | 0.73 | 0.80 | 0.81 | 0.49 | 0.50 |
| 5. Social phobia | 0.78 | 0.79 | 0.79 | 0.79 | 0.76 | 0.76 |
| 6. Separation anxiety | 0.76 | 0.75 | 0.76 | 0.77 | 0.79 | 0.80 |
| 7. Specific phobia – animal | 0.64 | 0.66 | 0.77 | 0.77 | 0.77 | 0.77 |
| 8. Specific phobia – medical | 0.74 | 0.73 | 0.78 | 0.79 | 0.84 | 0.83 |
| 9. Specific phobia – situational/environmental | 0.84 | 0.85 | 0.80 | 0.89 | 0.78 | 0.77 |
| 10. Traumatic stress | 0.80 | 0.85 | 0.88 | 0.89 | 0.81 | 0.82 |
| **Overall SCARED-R** | **0.89** | **0.88** | **0.89** | **0.88** | **0.89** | **0.88** |
| NOK – Q5 | 0.90 | 0.91 | 0.90 | 0.90 | 0.90 | 0.90 |
| NOK – Q7 | 0.87 | 0.87 | 0.86 | 0.87 | 0.85 | 0.86 |
| CDI – Q5 (For the whole school population) | −0.35 | −0.33 | −0.38 | −0.33 | −0.38 | −0.33 |
| CDI – Q6 (For the whole school population) | −0.35 | −0.37 | −0.40 | −0.40 | −0.38 | −0.37 |
| CDI – Q5 (For students scoring above 26) | −0.94 | −0.91 | −0.90 | −0.99 | −0.92 | −0.92 |
| CDI – Q6 (For students scoring above 26) | −0.86 | −0.85 | −0.99 | −0.96 | −0.89 | −0.86 |
| Obsessive | 0.62 | 0.63 | 0.66 | 0.66 | 0.63 | 0.69 |
| Compulsive | 0.68 | 0.68 | 0.70 | 0.71 | 0.69 | 0.68 |
| OCD | 0.75 | 0.74 | 0.78 | 0.78 | 0.66 | 0.66 |
| **MASC – Q6** | | | | | | |
| Physical anxiety | 0.82 | 0.81 | 0.80 | 0.81 | 0.83 | 0.84 |
| Social anxiety | 0.84 | 0.84 | 0.87 | 0.87 | 0.84 | 0.84 |
| Separation | 0.76 | 0.77 | 0.81 | 0.81 | 0.85 | 0.84 |
| Harm avoidance | 0.68 | 0.70 | 0.62 | 0.64 | 0.77 | 0.75 |
| **MASC** | **0.87** | **0.87** | **0.87** | **0.88** | **0.88** | **0.88** |

**Appendix 2a:** Correlations between CDI, NOK and MASC — Set 1

| | CDI | NOK |
|---|---|---|
| NOK | 0.110(**) | – |
| Physical anxiety (somatisation) | 0.056 | 0.418(**) |
| Social anxiety (humiliation, performance anxiety) | 0.131(**) | 0.177(**) |
| Separation anxiety (panic) | 0.107(**) | 0.274(**) |
| Harm avoidance (perfection, anxious coping) | 0.069(*) | 0.076(*) |

* Correlation is significant at the 0.05 level (two-tailed)
** Correlation is significant at the 0.01 level (two-tailed)

**Appendix 2b:** Correlations between MASC and OCD — Set 2

| | OCD |
|---|---|
| Physical anxiety (somatisation) | −0.204(**) |
| Social anxiety (humiliation, performance anxiety) | −0.105(**) |
| Separation anxiety (panic) | −0.188(**) |
| Harm avoidance (perfection, anxious coping) | −0.008 |
| MASC | −0.238(**) |
| Obsessive only | – |
| Compulsion only | – |

* Correlation is significant at the 0.05 level (two-tailed)
** Correlation is significant at the 0.01 level (two-tailed)

**Appendix 2c:** Correlations between SCARED-R and NOK — Set 3

| Variable | Correlation |
|---|---|
| Panic | 0.338(**) |
| Generalised anxiety | 0.192(**) |
| Separation anxiety | 0.237(**) |
| School phobia | 0.194(**) |
| Social phobia | 0.069(*) |
| Obsessive compulsive | 0.230(**) |
| Traumatic stress | 0.192(**) |
| Specific phobia (animals) | 0.095(**) |
| Specific phobia (medical) | 0.134(**) |
| Specific phobia (situational/environmental) | 0.162(**) |
| SCARED | 0.307(**) |

* Correlation is significant at the 0.05 level (two-tailed)
** Correlation is significant at the 0.01 level (two-tailed)