Original Article

EDUCATIONAL ATTAINMENT AND SCREENING POTENTIAL OF THE 12 ITEM GENERAL HEALTH QUESTIONNAIRE: A REASSESSMENT

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ABSTRACT

INTRODUCTION: The General health Questionnaire (GHQ) is the most popular instrument for screening psychopathology globally. It is widely used locally and has been translated into a few Nigerian languages. Research on the relationship between educational attainment and the screening ability of the English version among Nigerians is scanty.

AIMS: This study aims to determine the effect of educational attainment on the screening potential of 12-item General Health Questionnaire (GHQ-12) among persons in Ilupeju, Lagos.

METHODOLOGY: A random sample of 399 participants was drawn from worshipers from some churches in Ilupeju in Lagos state. Socio-demographic questionnaire and the English version of the GHQ-12 were administered to the selected church members. Participants who had a GHQ score of 2 or greater than 2 and 20% of those that had a GHQ score less than 2 had Structured Clinical Interview for DSM-IV (SCID) administered to them. The data was analysed with the Statistical Package for Social Sciences, 21st edition (SPSS-21).

RESULTS: The sensitivity and specificity of the GHQ-12 among those who had secondary education or less (non-tertiary) was 82.0% and 64.2% respectively, while the sensitivity and specificity among those who had tertiary education was 89.1% and 81.4% respectively. A comparison of correctly classified and misclassified cases in both groups yielded a statistically significant difference (p=0.04). Subjects with low education were found to be 3.23 times more likely to be misclassified as false positive (95% CI 1.11-9.34, p=0.03) and 2.27 times more likely to be misclassified on the whole (95% CI 1.009-5.107, p=0.04).

CONCLUSION: The performance of the English version of the GHQ 12 is poorer when used among persons with lower educational attainment. Standardization of the GHQ 12 for use among this demographic may need to be given research priority in order to improve its screening potential. A locally developed alternative in simplified English may also be considered.

KEY WORDS: GHQ 12, Education, Educational level, screening, Validity

RUNNING TITLE: Educational attainment and GHQ 12

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INTRODUCTION

The General Health Questionnaire (GHQ) is a standardized self-report measure that was designed to detect current psychiatric disorder in community or other non-psychiatric settings.[1] It is a screening instrument, therefore only detects possible cases of psychiatric morbidity and requires subsequent psychiatric interview for confirmation of diagnosis. Although originally a 60 item scale, it has been shortened to 30 item, 20 item, 28 item and 12 item versions which have been validated and used in a variety of contexts worldwide.[2–4]

The 12 item version is the most widely used screening tool for mental disorder, as well as a measure of general psychological well-being, both locally and internationally.[5–7]It has been translated into over 40 languages including Yoruba, with at least 50 validation studies conducted internationally to test and standardize it for use in many settings.[8,9]Due to its brevity and ease of administration, it is recommended for use in busy clinics or other scenarios where a quick screen is required.[10]

It was standardized by Gureje and Obikoya for use in the Nigerian population. Using the Composite International Diagnostic Interview (CIDI) as a gold standard, a cut off of 2 was obtained as the optimum threshold for caseness with a sensitivity of 77.8% and a specificity of 79.4%.[11] Some other authors such as Abiodun found that the GHQ 12 performed optimally at a cut off of 3, in a study that compared its psychometric properties against the Hospital Anxiety scale.[12] Makanjuola reported an optimal

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cut off of 4 when being used to screen for common mental disorders, specifically anxiety and depression.[13]

Self-administered questionnaires are a primary means of data collection in mental health, whether in clinic or the community and are known to have some limitations which include response distortions, readability of the scale as well as literacy of the respondent.[14]Two main types of response distortions have been described in literature i.e. response style and response set.[15]

Response style refers to the tendency of respondents to answer in a particular direction irrespective of the content of the question asked. In the Acquiescence response style, respondents have a tendency to respond positively to a question irrespective of its content.[15]Extreme and moderacy response styles, another type of response distortion, refers to the tendency for subjects to consistently respond using only a particular section of the scale, i.e. favouring only extreme or only moderate self-ratings.[15,16]
The second type of response distortion is known as response set, the most studied type being social desirability bias, which makes subjects consciously or unconsciously respond in a manner that presents them in a favourable light.[15]

Low literacy can also affect the performance of self-administered questionnaires, leading to a poor understanding of the questionnaire, especially if not worded in a local language. In order to successfully self-administer a questionnaire, subjects should be able to read, write and understand the questionnaire level with some level of proficiency. If questionnaires are not standardized specifically to improve their readability, in order to make them more applicable to people with lower education, performance in this demographic may be poor.[14]
The GHQ-12has been translated into a few Nigerian languages in an attempt to bridge the English literacy gap. This gesture while commendable hardly solves the problem, especially when it is considered that Nigeria is home to over 400 local languages.[17] Since translations of the GHQ-12 in local Nigerian languages are scarce, the researcher mostly has to resort to the use of the English version.
For a questionnaire that was designed for use in the community, it is important to consider what effects educational attainment could have when it is administered among Nigerians. In the researchers' field experience, persons of low educational status frequently ask for clarification on the GHQ 12 when it is administered to them. This suggests some difficulty with understanding the questionnaire which could negatively impact its screening potential, with important implications for its use as a research instrument in this demographic. The relationship between the educational attainment and the accuracy of the GHQ-12 has not been previously researched in Nigeria. This study aims to determine the effect of educational attainment on the screening potentials of GHQ 12 (English version) among church members in Ilupeju, Lagos.

METHODOLOGY

Ilupeju is a locality in Mushin Local Government Area of Lagos state, Nigeria. Mushin has a population of about 633,009 inhabitants.[18] Ilupeju is one of the industrial areas in Lagos state where people from all tribes in the country reside. It is made up of a residential, well planned estate where people from all socioeconomic classes live. It is located 10km north of the Lagos city centre, so people from other neighboring Local Government Areas have access to this locality for services.
This was a cross-sectional study carried out among members of 11 churches in Ilupeju, Lagos. The multistage sampling technique was used in church selection. There are twenty seven registered Pentecostal and six syncretic churches in Ilupeju with a ratio of 27: 6 which was further simplified to 9:2. In the first stage, simple random sampling technique (ballot method) was used to select the churches. The first nine and the first two churches picked in a ballot on the Pentecostal and syncretic groups respectively were included in the study. In the second stage, the balloting method was again used to recruit subjects from among church members. Only persons between the ages of 18 and 65, who had at least primary education, were considered. This was repeated in each church until a total of 399 subjects were recruited.

A Socio-demographic questionnaire and GHQ-12 (English) were administered to the subjects with the help of trained research assistants. Study questionnaires were read out verbatim for a few persons (20) who had difficulty reading it themselves. The GHQ was scored immediately after, and those who scored 2 and above along

with 20% of those who scored less than 2 were selected for the second stage of the study. The Structured Clinical Interview for DSM-IV (SCID) which is a semi-structured interview guide for making DSM-IV diagnoses was administered by the researcher, blind to the GHQ score.[19] The data was analysed with the IBM Statistical Package for Social Sciences, version 21(IBM SPSS-21).

ETHICAL CONSIDERATIONS

Approval for the study was obtained from the Research and Ethics Committee of the Federal Neuropsychiatric Hospital, Yaba and from the pastorate of each of the 11 Churches at, Ilupeju. Written informed consent was taken from the subjects who met the inclusion criteria for the study after the aim of the study was explained to them. The subjects with identified psychopathology were referred to the closest mental health facility to their place of abode.

RESULTS

Of the 399 subjects that completed the questionnaire 158 (39.8%) were from the Syncretic churches, while 240 (60.2%) were from Pentecostal churches. Table 1 shows the sociodemographic characteristics of the sample. A majority of the respondents were between the ages of 31 and 50, representing 49.4% of the sample. Females were more compared to males and comprised 54.9%. On the educational status variable, 200 persons had attained tertiary education while 199 had secondary education or less.

Table 1: Sociodemographic Characteristics of the Respondents

Variable	Frequency	Percentage
Age group		
18-30 years	135	33.8
31-50 years	197	49.4
>50 years	67	16.8
Mean		
Gender		
Male	180	45.1
Female	219	54.9
Marital status		
Single	169	41.4
Married	208	53.1
Divorced, separated, widowed	22	5.5
Educational status		
Secondary and below (non-tertiary)	199	49.9
Tertiary	200	50.1
Employment status		
Employed	308	59.1
Unemployed	91	40.9
Total	399	100

Table two shows the psychometric properties of the GHQ for those who have attained tertiary education and those who have less (i.e. Non-tertiary education). Among the former, the GHQ 12 had a sensitivity of 89.1% and specificity of 81.4%. It had a sensitivity of 82.0% and specificity of 64.2% among those who had not attained tertiary education, both lower in comparison. The tertiary group had a positive predictive value of 80.4% and a negative predictive value of 89.7% while the non-tertiary group had a positive predictive value of 68.0% and a negative predictive value of 79.0%.

Table 2: Psychometric Properties of the GHQ 12 in Tertiary Group and the Non-tertiary Group

	Tertiary	Non-Tertiary
Sensitivity	89.1	82.0
Specificity	81.4	64.2
PPV	80.4	68.0
NPV	89.7	79.4

Table three compares misclassification on the GHQ for both groups. Misclassification rate in the non-tertiary group was 27.2%, almost double the rate in the tertiary group (15%). This difference was statistically significant (p=0.04).

Table 3: Comparison of Misclassification By GHQ 12 in Both Groups

	Non - Tertiary (%)	Tertiary (%)	Statistics
Misclassified	22 (27.2)	12 (15.0)	x^2= 3.73
Correctly Classified	59 (72.8)	68 (85.0)	df=1 p=0.04
Total	81 (100)	80 (100)	

Table four displays the odds of being misclassified on the whole, or being misclassified as false positive or false negative. Subjects with low education were found to be 3.23 times more likely to be misclassified as false positive (95% CI 1.11-9.34,p=0.03) and 2.27 times more likely to be misclassified on the whole (95% CI 1.009-5.107, p=0.04).

Table 4: odds ratio for being misclassified according to Educational attainment

	Educational Attainment		Odds ratio [95% CI)	p value
	High Education	Low Education		
False positive (n=23)	8	15	3.23(1.116-9.349)	0.03
False negative (n=11)	4	7	2.16 (0.549-8.533)	0.27
Overall Misclassification(n=34)	12	22	2.27(1.009-5.107)	0.04

DISCUSSION

In this study, we attempted to investigate the effects of educational status on the screening ability of the GHQ 12. Our finding was similar in some regard to a previous study in Chile, which found that patients with low education in primary care were more likely to get a false positive screen, compared to those with high education.[20] They investigated the effect of sociodemographic variables on the performance of the GHQ-12; educational attainment was just one among the variables and was found to have the strongest association with the performance of the GHQ-12.

Whereas they reported that those with higher education had significantly higher false negative rates, the trend in our data was the reverse, with higher (though non-significant) false negative rate among subjects with lower educational attainment. It appears that in our sample, those with low education are more disadvantaged on the whole as regards the screening ability of the GHQ. This is supported by the overall significantly higher misclassification rate which we found among them. Their study did not report sensitivity, specificity, positive predictive value or negative predictive values for the comparison groups.[20]

Another study in Brazil found that the GHQ-12 discriminated more accurately among people who were better educated (defined as having greater than 4 years of education).[21]

They reported an independent effect of educational level on false positive rate of the GHQ-12, with less educated respondents being more likely to be classified as false positive, but only an interactive effect between educational

level and gender on the false negative rate. Better educated males were more likely to be classified as false negative whereas better educated females were less likely to be classified as false negatives. They reported a sensitivity of 82 for the less educated which is identical to our finding and a specificity of 72 (64 in our study). Sensitivity for the better educated was 86 (89.1 in our study) while specificity was 87 (81.4 in our study).[21] It can be observed that the differences between comparison groups were wider apart in our study, especially for sensitivity. The validity of these comparisons may be limited because both the discussed studies were conducted in different socio-cultural contexts with locally optimized cut off points.

Several reasons may explain the better performance of the GHQ 12 among the better educated. The Acquiescence response style, for example, has been found to be higher among people with lower educational attainment. According to Rammstedt, persons with lower education are "tied more to the concrete and immediate", faring less well in scenarios that that require abstraction.[16] Extreme moderacy response style is also reported to be more likely among respondents with low education.[15] The relationship between years of education and response set is conflicting in literature. While some report that it is more likely among persons with higher educational attainment, one meta-analysis found that it was more correlated with persons with fewer education years.[22]

From the researchers' field experience, complaint about poor understanding of GHQ-12 items (English version) by persons with low literacy isquite common. This informs our opinion that the poor performance of the GHQ 12 among people with low educational attainment as observed in our study is primarily due topoor understanding of the questionnaire, a direct consequence of low literacy. The validation study of the GHQ 12 among Nigerians did not correlate readability of the questionnaire and years of education.[11] It therefore did not set a threshold as regard years of education, below which its use may be inappropriate in its original English form. Perhaps more needs to be done as regards standardization of this instrument for Nigerians in this demographic.

CONCLUSION

Our findings suggest that the performance of the English version of the GHQ 12 is affected by the educational level of respondents. This observation assumes great significance in a multilingual country like Nigeria where it may not be feasible to translate questionnaires into every local language.

Further research to ascertain the readability of the GHQ 12 among persons with few years of education, using instruments such as Flesch-Kincaid readability should be given priority.

It may also be necessary to perform a standardization which would involve paraphrasing the items of the questionnaire in simple English language. Such paraphrasing has been done on the original British version of the GHQ to yield the North American version, also in English, which was phrased for easy understanding and local applicability. A similar modification of the GHQ 12 for the Nigerian populace may therefore not be out of place. It would in all likelihood improve its range of applicability across sociodemographic strata, and better its performance as a quick screening instrument among Nigerians in general.

REFERENCES

1. Goldberg DP. A user's guide to the General Health Questionnaire / David Goldberg and Paul Williams. - Version details - Trove [Internet]. NFER-Nelson Publishing Company Limited. 1988. p. 129. Available from: http:// trove.nla.gov.au/work/18049508?q&versionId=21182576
2. Yussuf AD, Issa BA, Ajiboye PO, Buhari OIN. The correlates of stress , coping styles and psychiatric morbidity in the first year of medical education at a Nigerian University. 2013;206-15.
3. Yunusa M, Obembe A. Prevalence of psychiatric morbidity using GHQ-28 among cleft lip patients in Sokoto. Ann Afr Med. 2013;12(2):135.
4. McDowell I. Measuring Health - a Guide To Rating Scales and Questionnaires. Oxford University Press. 2006. 208 p.
5. Sánchez-lópez MP, Dresch V. The 12-Item General Health Questionnaire (GHQ-12): Reliability, external validity and factos structure in the Spanish population. 2008;20(1991):839-43.
6. Ajiboye PO, Abiodun OA, Sanya EO, Wahab KW, Buhari OIN, Ayanda KA, et al. Psychiatric morbidity in a nigerian neurology clinic. 2012;89(2):64-70.
7. Ogualili P, Anyiam D, Ezejiofor O. Prevalence of Psychiatric Morbidity among Medical Practitioners in an Urban town in Nigeria. orient J Med. 2017;29(3-4):98-105.

8. Gureje O. Reliability and the factor structure of the Yoruba version of the 12?item General Health Questionnaire. Acta Psychiatr Scand. 1991;84(2):125-9.
9. Weich S, Phelan M, Mann A. Measurement in Psychiatry. In: Murray R, Hill P, McGuffin P, editors. The Essentials of Postgraduate Psychiatry. Cambridge: Cambridge University Press; 1997. p. 68-9.
10. Goldberg DP, Gater R, Sartonius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med. 1997;27:191-7.
11. Gureje O, Obikoya B. The GHQ-12 as a Screening Tool in a Primary Care Setting. Soc Psychiatry Psychiatr Epidemiol. 1990;25:276-80.
12. Abiodun O a. A validity study of the Hospital Anxiety and Depression Scale in general hospital units and a community sample in Nigeria. Br J Psychiatry. 1994;165(5):669-72.
13. Makanjuola VA, Onyeama M, Nuhu FT, Kola L, Gureje O. Validation of short screening tools for common mental disorders in Nigerian general practices. Gen Hosp Psychiatry. 2014;36(3):325-9.
14. DeRubeis RJ, Strunk DR. The Oxford Handbook of Mood Disorders. DeRubeis RJ, Strunk DR, editors. Vol. 1. Oxford University Press; 2015. 102-103 p.
15. Razavi T. Self-report measures: an overview of concerns and limitations of questionnaire use in occupational stress research. Discuss Pap Account Manag Sci. 2001;1-23.
16. Rammstedt B, Kemper CJ, Borg I. Correcting Big Five Personality Measurements for Acquiescence: An 18-Country Cross-Cultural Study. Eur J Pers. 2013;27(1):71-81.
17. Danladi SS. LANGUAGE POLICY: NIGERIA AND THE ROLE OF ENGLISH LANGUAGE IN THE 21ST CENTURY. Eur Sci J. 2013;9(17):1-21.
18. National Population Commission. National population census. Abuja, Niger Natl Popul Comm. 2006;
19. First M, Spitzer R, Gibbon M, Williams J. Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition (SCID-I/P). New York; 2002.
20. Araya R, Wynn R, Lewis G. Comparison of two self administered psychiatric questionnaires (GHQ-12 and SRQ-20) in primary care in Chile. Soc Psychiatry Psychiatr Epidemiol. 1992;27(4):168-73.
21. de Jesus Mari J, Williams P. Misclassification by psychiatric screening questionnaires. J Chronic Dis. 1986;39(5):371-8.
22. Ones DS, Vswesvaran C, Reiss AD. The role of social desirability in personality tests for personnel selection: The Red Herring. J Appl Psychol. 1996;78(December):679-703.