

Prevalence and Knowledge of Depression among Medical Students at The University of Port Harcourt, Nigeria

Nkporbu A.K.^{1,*}, Asuquo E.O.², Okechukwu C.¹, Onoh I.¹, Okefor T.²

¹Department of Neuropsychiatry and Mental Health, University of Port Harcourt, Teaching Hospital, Nigeria

²Department of Preventive and Social Medicine, University of Port Harcourt, Nigeria

*Corresponding Email: Nkporbu A.K (MBBS, M.ScPharmacol, MPH, FWACP)
nakpigi2008@yahoo.com

Abstract

The rising prevalence and burden of Depression among all age groups has continued to constitute enormous concern world wide. A stressful and rigorous academic programme or curriculum such as the one run in most medical schools could contribute to the occurrence of depression among medical students. To determine the prevalence and knowledge of depression among medical students in the University of Port Harcourt. This study was a descriptive cross-sectional study. Stratified random sampling method was used to select the respondents from all the classes except first year which was considered not a true medical class and fourth year because there were no medical students in that class as at the time of the study. A well structured open ended self-administered socio-demographic and knowledge-based questionnaire was administered to the students. The Zung Self Rated Depression Scale was used to assess the depression status of each respondent in conjunction with the Diagnostic Statistical Manual, Version Five (DSM V). The data was analyzed using descriptive and analytical methods. The prevalence of depression among the medical students was 5.3%. Fourteen students (4.6%) were mildly depressed while only two respondents had moderate depression. Year 3 students had the highest prevalence with 10.5% followed by final year students with 5.3%, while the only 2 cases of moderate depression were found among students in Year 2. Two hundred and seventy-one respondents (88.8%) were found to have good knowledge of depression, 32 (10.5%) were found to have average knowledge of depression and 2(0.7%) had poor knowledge of depression. Depression does occur among medical students at the University of Port Harcourt albeit low. However, there was a high level of knowledge about depressive illness among the students. The present medical curriculum and programme should be sustained and more efforts at making it less stressful and academic friendly be made to further reduce the current rate of depression among the students.

Keywords: Prevalence, Knowledge, Depression, Medical Students, University of Port Harcourt

1. INTRODUCTION

The prevalence of depression has continued to increase at a rather alarming rate among all age groups and equally constituting enormous health concern world wide (Brooks-Gunn & Petersen, 1991, Petersen et al., 1993, Murray & Lopez, 1996, Birmaher et al., 1996, Ferrari et al., 2010, Marcus et al., 2012). This may be due to the increasing burden of adverse environmental factors in addition to genetic vulnerability (Brooks-Gunn & Warren, 1989, Plomin & Bergeman, 1991, Kendler et al., 1993, Kendler & Karkowski-Shuman, 1997, Lewinsohn et al., 1998). Variable degree of stress has been found to be a feature of most academic programmes particularly medical education (Sherina et al., 2004, CMHC UT, 2015). A stressful and rigorous academic programme or curriculum such as the one run in most medical schools could contribute to the occurrence of psychological stress and depression among medical students (Zoccolillo et al., 1986, Givens & Tija, 2002, Adewuya et al., 2006, Aniebue & Onyema, 2008, Roh et al., 2010, Sidana et al., 2012).

Depression is a psychiatric illness described as a primary mood disorder and the most prevalent of all mental disorders (Weissman & Klerman, 1992, Ahuja & Ahuja, 2011, Marcus et al., 2012). It is a leading contributor to the global burden of disease and a common illness with an estimated 450 million people affected worldwide (Marcus et al., 2012, WHO, 2012). Depression is associated with both real and hidden family, community, and national economic losses with impaired social and occupational functions (Lorenzo et al., 2000, Gul et al., 2009). The World Mental Health Survey conducted in 17 countries found that an average of 1 in 20 people reported having an episode of depression in the previous year (Marcus et al., 2012). Prevalence rates of depression vary by country and by region with highest rates in Afghanistan and lowest in Japan (Ferrari et al., 2010). At its worst, depression can lead to suicide with over 800,000 people dying from suicide each year (WHO, 2012, American Foundation for Suicide Prevention, 2016). Suicide is the second leading cause of death in 15-29-year olds and over 50% of their deaths is due to depression (WHO, 2012, American Foundation for Suicide Prevention, 2016). The burden of depression and other mental health conditions is on the rise globally (Murray & Lopez, 1996).

A medical school is a tertiary educational institution – or part of such an institution that teaches medicine and awards a professional degree that qualifies one to practice medicine. Although there are several medical schools in Nigeria, gaining admission and/or finishing from them is highly competitive and demanding, and this could impact enormous stress. (Adewuya et al., 2006, Aniebue&Onyema, 2008). Both the length of the training, the structure and curriculum as well as the finance required for the training of a medical student particularly in the developing nations, where modern studying aids may not be within the reach of average families, may constitute some degree of burden to both the students as well as any average family (Adewuya et al., 2006, Aniebue&Onyema, 2008).

Today many tertiary institution students are battling depression at a record rate and a steady increase of students reporting struggling with their mental health. Medical students are vulnerable to mental illnesses including depression (Adewuya et al., 2006, Aniebue&Onyema, 2008, Muhammad, et al., 2012). The ages of 18-25 are the prime time for serious conditions to emerge because is the range associated with most curiosity, adventure and experimentation³. We are in an increasingly complex and competitive world and the school environment is not an exception. In fact, in the very high-pressure schools, like medical schools, there seem to be more students reporting depression and anxiety disorders, some even committing suicides (Adewuya et al., 2006, Aniebue&Onyema, 2008, WHO, 2012, American Foundation for Suicide Prevention, 2016).

College students face unique difficulties that might make them more vulnerable to mental health problems especially depression and anxiety than others (Sherina, et al., 2004, Adewuya et al., 2006). There are stressors of tertiary institution that students are exposed to such as risky behavior, alcohol use, and sexual assault in addition to the academic stressors (Sherina, et al., 2004, Adewuya et al., 2006). Medical students because of their rigorous training have rates of depression that are higher than those of the general population (Adewuya et al., 2006). In addition, medical students are faced with more thorough academic evaluation with the risk of repeating the academic year if failed, poor sleep, exposure to patient suffering and death, high expectations from family and friends and student abuse (bullying by senior colleagues and

doctors). In extreme depression, inability to cope successfully with the stress of medical education may result in a cascade of consequences like poorer academic performance, alcohol and substance abuse, impairment of functioning in the classroom and clinical practice and suicidal ideations. A student who is not academically grounded, well determined may be further vulnerable to such stress. ¹⁴Furthermore, peer group influence and lifestyles among the students can also serve as a great source of distraction to the students adding to their academic stress. A depressive episode can worsen leading to suicide or resolve after a while or following treatment.

A study among undergraduate medical students in the United States of America found that 23% of the students had clinical depression and 57% were under psychological stress ((Sherina, et al., 2004) and it was similar to the study conducted in the University of Nigeria Teaching Hospital, Enugu Campus which put the prevalence of depression among medical students at 23.3%. (Aniebue&Onyema, 2008). This agreed with a cross sectional study among 237 medical students in Maulana Azad Medical College, New Delhi where the overall prevalence of provisionally diagnosed depressive and major depressive disorder was 21.5% and 7.6%, respectively (Sidana et al., 2012). A study done by Adewuya et al on depression among undergraduate students in universities in Western Nigeria targeting 1206 nonmedical students also showed similar result that 8.3% of the students met the criteria for major depressive disorder (Adewuya et al., 2006). In all studies, depression rates are much higher among medical undergraduates compared with their nonmedical counterparts (Sherina et al., 2004, Adewuya et al., 2006, Aniebue&Onyema, 2008).

In a similar study evaluating the use of mental health services by depressed medical students in the University of California, San Francisco, it was found that 24% of medical students had depression (BDI>8) (Kumar et al., 2012).

The few studies carried out have not determined the relationship between the presence and degree of depression and year of study. Researchers however have varying opinions about this relationship, with majority purporting that depression and anxiety increase as students' progress through their medical training (John et al., 1997); the only exception to this trend occurring in the first year where the prevalence of depression is greater than in any other year (Vaz et al., 1998,

Moffat et al., 2004). This exception may be due to a number of unique stressors facing first year students that relate to the transition from secondary school to university, homesickness, unfamiliarity with academic procedures and demands, time management, the process of making new friends and increased expectations from both family and peers (Vaz et al., 1998, Moffat et al., 2004). Another study done in a medical school also noted that the incidence of poor mental health on the General Health Questionnaire 12 doubled during the first year, increasing from 25% to 52%.³² Two additional studies of US students confirm a peak in depression during the second year of medical school, with gradual improvement during the third and fourth year of training (Hyssenbegasi, et al., 2005, Tija et al., 2005).

It is critical for medical educators to understand the prevalence and causes of depression among medical students, its adverse consequences, and institutional factors that can positively and negatively influence student health and academic outcome (Guthrie et al., 1998, Moffat et al., 2004, Hyssenbegasi, et al., 2005, Tija et al., 2005, Liselotte et al., 2005, Danlin et al., 2005, Zaid et al., 2007, Abdulaghani et al., 2011, Coumaravelou et al., 2014). Research on this topic and adequate intervention methods for depression among medical students are still very scanty in Nigeria, the Niger Delta and Rivers State in particular, hence, the need for the study to help produce more competent and emotionally stable medical doctors. The aim of this study therefore was to determine the prevalence and knowledge of depression among medical students in the University of Port Harcourt.

2. RESEARCH METHODOLOGY

2.1 Study Design

This study was a descriptive cross-sectional study

2.2 Study Setting

The study was carried out at the University of Port Harcourt. The University of Port Harcourt was established in 1975 and is located along East – West Road, Choba, Rivers State. It has an estimated 35,000- 40,000 students. The College of Health Sciences which was created in 1978, has two main divisions related to medical students – Faculty of Clinical Sciences and Faculty of Basic Medical Sciences (Hyssenbegasi, et al., 2005).

2.3 Study Population and Sampling

There were a total of 725 medical students in the College of Health Sciences of the University of Port Harcourt, with 119 in year 1, 124 in year 2, 104 in year 3, none in year 4, 161 in year 5, 144 in year 6b and 73 in year 6aas at the time of the study. However, year 1 students were excluded from the study because the actual medical programme starts from year 2, hence the total students from year 2 to year 6 was 606. A stratified random sampling method was used for this study. A proportionate sample was drawn from each class of medical students from year 2 to year 6 students except for year 4 (as there were no medical students in year 4) to enable comparison. The study spanned from February to September 2016.

2.4 Study Instruments

A well-structured open-ended self-administered socio-demographic and knowledge-based questionnaire was administered to the students. Questions were asked to assess the respondents' knowledge of depression and knowledge grouped into = good ($\geq 70\%$), average (69-50%) and poor ($\leq 49\%$).

The Zung Self Rated Depression Scale was used to assess the depression status of each respondent. This was used in conjunction with the Diagnostic Statistical Manual, Version Five (DSM V). The Zung Self Rated Depression Scale is a 20 - item, self-rating scale used widely in screening, assessing affective, psychological and somatic symptoms associated with depression in a variety of clinical and non-clinical settings (Zung, 2016). Items were framed in terms of positive and negative statements, scored on a Likert scale ranging from 1 to 4 and total scores range from 20 to 80. A score above 70 shows severe depression, 60 to 69 suggests moderate depression, 50 to 59, mild depression and 20 to 49 shows slight to no depression (Zung, 2016).

2.5 Statistical Analysis

The data was entered using Microsoft Excel and was analyzed using SPSS version 17 and EPI INFO 7.0 and interpreted with tables. Mean and standard deviation were calculated. Chi-square and logistic regression were used for comparison of variables.

2.6 Ethical Approval

Approval for the study was obtained from the ethical committee of the University of Port Harcourt and informed consent was equally obtained from all participants. The study was entirely voluntary and any student who declined participation was not victimized in any way.

2.7 Limitation

1. Industrial actions in the university and the hospital affected the timing and continuity of the study.

3. RESULTS

A descriptive cross-sectional study was carried out with 346 questionnaires distributed over the course of 4 weeks; 41 were not filled properly, making them invalid and bringing the total number of questionnaires returned to 305. Response rate hence, was 88%.

3.1 Socio-demographic Characteristics of Respondents

Respondents within the age group of 20-24 constituted the largest percentage with 146 (47.9%), followed by the age group of 25-29 with 98 (32.1%) while that of 35-39 was the least with 4 (1.3%). Majority of the respondents were clinical students, constituting about 189 (62.0%) with the highest proportion of respondents belonging to the year 5 class: 79 (26.0%).

The family position of the respondents revealed that 109 (35.9 %) were first born children and 59 (19.4 %) were lastborn. Only 5 (1.6%) of the medical students did not have any siblings while 2 had more than 12 siblings. However, majority of the respondents had 1 to 4 siblings (62.3%).

A good number of the respondents had parents with tertiary level of education: fathers with tertiary level of education were 229 (75.1%), while 23 (7.5%) had fathers with primary level of education. Two hundred and eleven had mothers (69.2%) with tertiary level of education, while 27 (8.8%) had mothers with primary level of education. Most of the respondents live on campus 163(53.4%). (Table 1).

Table 1: Socio-Demographic Characteristics of respondents

Socio-demographic Characteristics	Frequency (n =305)	Percentage (%)
Age Range		
15-19	29	9.5
20-24	146	47.9
25-29	98	32.1
30-34	22	7.2
35-39	6	2.0
≥40	4	1.3
Mean age: 24.29 ± 4.45		

Gender		
Female	138	45.2
Male	167	54.8
Faculty		
Basic Medical Sciences	116	38.0
Clinical Sciences	189	62.0
Level of Study		
Year 2	60	19.6
Year 3	57	18.7
Year 5	79	26.0
Year 6a	38	12.4
Year 6b	71	23.3
Family Position		
First	109	35.9
Middle	136	44.7
Last	59	19.4
Number of siblings		
None	5	1.6
1 – 4	190	62.3
5 – 8	103	33.8
9 – 12	5	1.6
≥ 12	2	0.7
Level of education of parents		
Father		
Primary	23	7.5
Secondary	53	17.4
Tertiary	229	75.1
Mother		
Primary		
Secondary	27	8.8
Tertiary	67	22.0
	211	69.2
Place of Residence		
Off Campus	142	46.6
On Campus	163	53.4

3.2 Prevalence of Depression among Medical Students

Of the respondents studied, majority, 289 (94.7%) were found to have no depression, However, 14(4.6%) were mildly depressed while only two respondents were found to have moderate depression. No case of severe depression was found among the respondents.

Prevalence of depression was also analyzed according to year of study. Respondents in Year 3 had the highest number of cases of depression 6 (10.53%). The only 2 cases of moderate depression were found among students in year 2. (Table 2)

Table 2: Prevalence of Depression among Medical Students in the University of Port Harcourt.

	Severe depression (≥ 70)	Moderate depression (69-60)	Mild depression (59-50)	No depression (20-49)	Total
Depression among medical student	0 (0%)	2 (0.7 %)	14 (4.6 %)	289 (94.7%)	305
Depression according to year of study	0 (0%)	2 (3.3%)	1 (1.7%)	57 (95%)	60
Year 2	0 (0%)	0 (0%)	6 (10.5%)	51(89.5%)	57
Year 3	0 (0%)	0 (0%)	2 (2.5%)	77(97.5%)	79
Year 5	0 (0%)	0 (0%)	3(4.2%)	68(95.8%)	71
Year 6B	0 (0%)	0(0%)	2(5.3%)	36(94.7%)	38
Year 6A					

3.3 Level of Knowledge of Depression among Medical Students in the University of Port Harcourt.

Two hundred and seventy-one respondents (88.8%) were found to have good knowledge of depression, 32 (10.5%) were found to have average knowledge of depression and 2(0.7%) had poor knowledge of depression. (Table 3).

Table 3: Level of Knowledge of Depression among Medical Students in the University of Port Harcourt.

Knowledge score (100%)	Frequency (305)	Percentage (100%)
Good knowledge (≥ 70)	271	88.8
Average knowledge (69-50)	32	10.5
Poor knowledge (≤ 49)	2	0.7

4. DISCUSSION

In our study, the prevalence of mild depression was 4.6%, moderate depression 0.7% and there were no respondents found with severe depression. This however did not agree with the study done on Mental Depression and coping strategies among medical students in the University of

Nigeria, Enugu Campus by Nwobi et al in 2009, which put the prevalence of mild depression at 27.6%, moderate depression at 8.9% and severe depression 1.6% (Zung, 2016). It also differed from the study done by Aniebue et al also in the University of Nigeria, Enugu Campus which put the prevalence of depression at 23.3% (Aniebue&Onyema, 2008). The finding in this study equally differs from earlier findings from other parts of the world which put the prevalence of depression among medical students between 21 – 39% (Zoccolillo et al., 1986, Sidana et al., 2012, Muhammad et al., 2012, Kumar et al., 2012).

Possible reasons for this disparity in findings between this study and others already done may be attributed to the facts that respondents possibly were not very honest with information provided in the questionnaires, they have better coping mechanisms and good social support structure as most of our respondents have parents who live together. Also, the low prevalence of depression found could also be due to the fact that the current study, unlike the earlier mentioned cases was done at a time when there is greater availability and easy access to the internet, social media and other forms of relaxation, and information technology has greatly revolutionized. Information is just a click away from the average medical student, the volume of work to be studied is available as soft copy on smart phones and the availability of e-library in the institution of study, thus helping to reduce the burden of learning on the medical student. This was different from what was obtainable a decade ago.

Majority of our respondents who were found to be depressed were female and there were more students found to be depressed in the lower classes (basic medical sciences), though these factors were not statistically significant. This agreed with a cross-sectional study on the prevalence and impact of depression among 7,357 medical students in South Korea which associated an increasing rate of depression with the female gender, younger age and students in lower classes (Ahuja & Ahuja, 2011). Hormonal effects, the fact that the females may face additional stressors including sexual harassments and also that they tend to have better health seeking behavior and volunteer their symptoms more easily may have accounted for the higher prevalence of depression among the female students in this study (Allgood-Merten & Lewinsohn, 1990,

Petersen et al., 1991, Kessler et al., 1993, Angold&Worthman, 1993, Hayward et al., 1997, Patton et al., 1997, Hankin& Abramson, 1999, Born et al., 2002).

Both biological and social factors have been implicated in explaining this rise in depressive symptoms among adolescent and younger aged girls (Brooks-Gunn & Warren, 1989, Plomin&Bergeman, 1991, Kendler et al., 1993, Kendler&Karkowski-Shuman, 1997, Lewinsohn et al., 1998). Because the emergence of sex differences in depression occurs within the period of greatest pubertal change, investigators have focused on the role of reproductive hormones(Allgood-Merten &Lewinsohn, 1990, Petersen et al., 1991, Kessler et al., 1993, Angold&Worthman, 1993, Hayward et al., 1997, Patton et al., 1997, Hankin& Abramson, 1999, Born et al., 2002). Some support has been found for an association between hormonal concentrations and negative affect ((Brooks-Gunn & Warren, 1989, Plomin&Bergeman, 1991, Kendler et al., 1993, Kendler&Karkowski-Shuman, 1997, Lewinsohn et al., 1998); however, social factors, including negative life events and their interaction with pubertal status (but not hormonal status), account for more of the variance in negative affect than biological factors alone (Kendler et al., 1993). Early pubertal timing and its social implications have also been postulated as an important risk factor in girls(Allgood-Merten &Lewinsohn, 1990, Petersen et al., 1991, Kessler et al., 1993, Angold&Worthman, 1993, Hayward et al., 1997, Patton et al., 1997, Hankin& Abramson, 1999, Born et al., 2002). Two recent studies, however, report that pubertal status has a greater influence in predicting female depression than age (Petersen et al., 1991, Hayward et al., 1997, Angold&Worthman, 1993, Patton et al., 1997) or the timing of puberty (Petersen et al., 1991, Hayward et al., 1997).

Also, in our study, most of those found to be depressed fell into the age bracket of 25 to 29years with a lower level of depression among the very young (15-19years) and those greater than 30years (Hayward et al., 1997, Born et al., 2002).This may be due to effect of over-representation. Earlier studies have noted that depression and indeed early onset emotional problems are more common among the younger age group in tertiary institution. This may be attributed to the fact that at the lower classes(the pre-clinical years), many students are yet to find their footings with so much worry and anxiety about the “unknown’ in medical school (Vaz et

al., 1998, Moffat et al., 2004). Some may still be struggling to adapt and adjust to the school environment while others may still be home sick and missing the love, affection and parental and family bonding at home (Vaz et al., 1998, Moffat et al., 2004).

Generally, the age range in tertiary school is predominantly a youthful age and is characterized by high level of curiosity and insatiable desire and experimentation. The ages of 18-25 are the prime time for serious emotional conditions to emerge because this is the most adventurous age range (Brooks-Gunn & Petersen, 1991, Petersen et al., 1993, Birmaher et al., 1996). As such, many students think once they are out of the house, they have the whole world to themselves and some get involved in risky behaviors and substance abuse. Most of such behaviours end up becoming regretful as they turn out to be detrimental to their lives and academic pursuit (Hyssenbegasi et al., 2005, Gul et al., 2009).

Majority of our respondents were found to have good knowledge of depression and this is likely due to the fact that they are medical students, and that psychological medicine is part of the medical curriculum, they may have been adequately exposed to the subject of depression, its presentation, treatment and possibly some preventive measures including coping mechanisms that may have helped some of the students. Improvement in learning materials and advancement in information technology may have also contributed in a way to the increase in knowledge of depression among the students. All these may have accounted in part for the lower rates of depression among the medical students in this study compared to most previous studies (Adewuya et al., 2006, Aniebue&Onyema, 2008).

5. CONCLUSION

Majority of the medical students in the University of Port Harcourt were found to have no depression. Efforts should be put in place to maintain the current level of psychological stability among the medical students and encourage healthy living among our future doctors.

6. RECOMMENDATIONS

1. The student-advisor-mentorship structure should be improved upon so that students may be able to relate their academic challenges to their mentors, who in turn can offer solutions to them.
2. Students should be encouraged to pursue extracurricular activities of interest to help ease off the stress of medical training.
3. A dedicated psychological/mental health Unit should be established in medical schools where psychologically vulnerable and emotionally troubled or traumatised students can easily seek counselling and advice.

REFERENCES

- Abdulaghani H. M., Alkanhal A. A., Mahmoud E S. (2011). Stress and its effects on Medical students: A cross sectional study at a college of medicine in Saudi Arabia. *Journal of Health, Population and Nutrition*.29 (5): 516 -522.
- Adewuya A O, Ola B A, Aloba O. (2006). Depression amongst Nigerian University Students; Prevalence and sociodemographic correlates. *SocPsychiatEpidemiol*.41: 674. doi: 10.1007/s00127-006-0068-9.
- Ahuja N., Ahuja S.(2011). A short textbook of psychiatry.7th Ed. New Delhi, India. Jaypee Brothers Medical Publishers: 71-2.
- Allgood-Merten BLewinsohn (1990)PM Sex differences and adolescent depression. *J AbnormPsychol*;9955- 63 [Article](#)
- American Foundation for Suicide Prevention.Physician and Medical Student Depression and Suicide Prevention.(2016). (last accessed August (2016). Available from: <http://afsp.org/our-work/education/physician-medical-student-depression-suicide-prevention/>
- Angold A., Worthman C. (1993) Puberty onset of gender differences in rates of depression: a developmental, epidemiological, and neuroendocrine perspectives. *J Affect disorder*.29145-158 [Article](#)
- Aniebue P. N., Onyema G. O. (2008). Prevalence of depressive symptoms among Nigerian medical undergraduates. *Trop Doct* Jul; 38 (3): 157-8.
- Birmaher B., Ryan N.D., Williamson D.E. et al. (1996). Childhood and adolescent depression: a review of the past 10 years, part I. *J Am Acad Child Adolesc Psychiatry*.351427-1439 [PubMedArticle](#)

- Born LS, Shea AS, Steiner M (2002). The roots of depression in adolescent girls: is menarche the key? *Curr Psychiatry Rep.* 4449- 460 [PubMedArticle](#)
- Brooks-Gunn JP, Petersen AC (1991). Studying the emergence of depression and depressive symptoms during adolescence. *J Youth Adoles.* 20115- 119 [Article](#)
- Brooks-Gunn JW, Warren MP (1989). Biological and social contributions to negative affect in young adolescent girls. *Child Dev.* 6040- 45 [Article](#)
- CMHC UT Counselling and Mental Health Centre, Division of Student Affairs; Depression. University of Texas, Austin; (2015). Available from: <http://cmhc.utexas.edu/depression.html>
- Coumaravelou S., Ray W. (2014). Medical students' experience of and reaction to stress: The role of depression and anxiety. Hindawi Publishing Corporation. *The Scientific World Journal.*, Article ID 737382; 1 – 8. <http://dx.doi.org/10.1155/2014/737382>
- Danlin M, Joneborg N, Runeson B. (2005). Stress and Depression among Medical Students: a cross sectional study. *Med Educ.* 39:594 – 604.
- Ferrari A. J., Charlson F.J., Norman R.E., Patten S.B., Freedman G. (2010). Burden of Depressive Disorders by Country, Sex, Age, and Year: Findings from the Global Burden of Disease Study. *PLoS Med* 10(11): e1001547. doi:10.1371/journal.pmed.1001547
- Garrison CZ, Waller JL, Cuffe SP, McKeown RE, Ady CL, Jackson KL (1997). Incidence of major depressive disorder and dysthymia in young adolescents. *J Am Acad Child Adolesc Psychiatry.*; 36:458- 465 [PubMedArticle](#)
- Givens J. L., Tija J. (2002). Depression among medical students' use of mental health services and barriers to use. *Acad. Med.* 77:918-21.19.
- Gul A, Unal A, Alaettin U, Didem A. (2009). Prevalence of depression, its correlates among students, and its effect on health-related quality of life in a Turkish university, *Upsala Journal of Medical Sciences*, 114:3, 170-177. <http://dx.doi.org/10.1080/03009730903174339>
- Guthrie E, Black D, Bagalkote H, Shaw C. (1998). Psychological Stress and Burnout in Medical Students: A five – year Prospective Longitudinal Study. *J R Soc Med.* 91(5):237 – 43.
- Hankin BL, Abramson LY (1999). Development of gender differences in depression: description and possible explanations. *Ann Med.* 31:372- 379 [PubMedArticle](#)
- Hayward, C., Killen J.D., Wilson, D.M., Hammer, L.D., Litt, I.F., Kraemer, H.C., Haydel F., Varady, M.A., Taylor, B.C. (1997). Psychiatric risk associated with early puberty in adolescent girls. *J Am Acad Child Adolesc Psychiatry.*; 36:255- 262.

- Hyssenbegasi A, Hass S L, Rowland C R. The Impact of depression on the academic productivity of university students. *J Ment Health Policy Econ*. 2005 September; 8(3):145-151.
- John A, Towes M D, Jocelyn M. Analysis of stress levels among medical students, residents and graduate students at four Canadian schools of medicine. *Acad Med* 1997; 72: 997 – 1002.
- Kendler KSKarkowski-Shuman L Stressful life events and genetic liability to major depression: genetic control of exposure to the environment? *Psychol Med*. 1997;27539- 547 [Article](#)
- Kendler K.S., Neale M., Kessler R., Heath A., Eaves L. A. (1993).Twin study of recent life events and difficulties. *Arch Gen Psychiatry*.;50789- 796 [Article](#)
- Kessler R.C., McGonagle K.A., Swartz M., Blazer D.G., Nelson C.B. (1993). Sex and depression in the National Comorbidity Survey, I: lifetime prevalence, chronicity, and recurrence. *J Affect Disord*.2985- 96 [Article](#)
- Kumar G S, Jain A, Hedge S. (2012). Prevalence of depression and its associated factors using Beck Depression Inventory among Students of a Medical College in Karnataka. *Indian J Psychiatry*. Jul-Sep; 54(3): 223 – 226. doi: 10.4103/0019-5545.102412.
- Lewinsohn PMRohde PSeeley JR (1998). Major depressive disorder in older adolescents: prevalence, risk factors, and clinical implications. *ClinPsychol Rev*.;18765-794 [PubMedArticle](#)
- Liselotte N, Dyrbye MD, Matthew R, Thomas MD et al. (2005). Medical Student Distress: Causes, consequences and proposed solutions. *Mayo clin Proc*. December80(12):1613 – 1622.
- Lorenzo MKFrost AKReinherz HZ (2000). Social and emotional functioning of older Asian American adolescents. *Child Adolesc Social Work J*.17289- 304 [Article](#)
- Marcus M, Yasamy M, van Ommeren M, Chisholm D, Saxena S. Depression - A Global Public Health Concern. WHO Department of Mental Health and Substance Abuse: 2012; 6-8.
- Moffat K, McConnachie A, Ross S, Morrison J. First year medical student stress and coping in a problem – based learning medical curriculum. *Medical Education*.2004; 38:482 – 491.
- Muhammad S. K, Sajid M, AreefB.Prevalence of Depression, Anxiety and their associated factors among medical students in Karachi, Pakistan. *J Pak Med Assoc*. 2012 Dec; Vol. 56, No. 12; 583 – 86.
- Murray CJLLopez AD (1996). *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability From Disease, Injuries, and Risk Factors in 1990 and Projected to 2020*. 1 Cambridge, Mass Harvard University Press

- Nwobi EA, Ekwueme O C, Ezeoke U E. (2009). Mental depression and coping strategies among medical students of University of Nigeria. *Journal College of Medicine*;14 (1): 188 – 260. available from; <http://www.ajol.info/index.php/jcm/articleview44848>
- Patton GCHibbert MECarlin JShao QRosier MCAust JBowes G M(1997). enarche and the onset of depression and anxiety in Victoria, Australia. *J Epidemiol Community Health*.;50661-666 [Article](#)
- Petersen ACCompas BEBrooks-Gunn JStemmler MEy S (1993). Depression in adolescence. *Am Psychol*.48155- 168 [PubMedArticle](#)
- Petersen ACSarigiani AKennedy RE (1991). Adolescent depression: why more girls? *J Youth Adolesc*.;20247- 271 [Article](#)
- Plomin RBergeman CS (1991). The nature of nurture: genetic influence on "environmental" measures. *Behav Brain Sci*.;14373- 386 [Article](#)
- Roh M S, Jeon H J, Kim H. (2010). The Prevalence and Impact of Depression among Medical Students: a nationwide cross-sectional study in South Korea. *Acad. Med* Aug; 85 (8): 1384-90. doi:10.1097/ACM.0b013e3181df5e43.
- Sherina M S, Rampal I, Kaneson N. (2004). Psychological stress among undergraduate medical students. *Med J Malaysia*.; 59 No 2: 207 – 211.
- Sidana S, Kishore J, Ghosh V, et al. (2012). Prevalence of depression in students of a medical college in New Delhi: A cross-sectional study. *AMJ*, 5, 5, 247-50. <http://dx.doi.org/10.4066/AMJ.2012.750>
- TheZung Self-Rating Depression Scale (2016). Available from: www.who.int/substance_abuse/research_tools/zungdepressionscale/en/
- Tija J, Givens JL, Shea JA. (2005). Factors associated with under treatment of medical student depression. *J Am Coll Health* 53:219 – 24.
- Vaz R F, Mbajjorgu E F, Acuda S W. (1998). A Preliminary Study of Stress Levels among first year Medical Students at the University of Zimbabwe. *Cent Afr J Med* 44: 214 – 219.
- Weissman M.M., Klerman GL (1992). Depression: current understanding and changing trends. *Annu Rev Public Health*.13319- 339 [Article](#)
- World Health Organisation. Media centre; Depression 2012. [reviewed April 2016]. Available from: <http://www.who.int/mediacentre/factsheets/fs369/en/>
- World Health Organisation. Mental Health; Suicide Data 2012. Available from: <http://www.who.int/mentalhealth/prevention/suicide/suicideprevent/en/>

Zaid Z A, Chan S C, Ho J. (2007). Emotional disorders among medical students in a Malaysian Private medical school. Singapore Med J; 48 (10): 895.

Zoccolillo M, Murphy G E, Wetzel R D. depression among medical students.J Affect Disord.(1986); 11: 91–96.

BIBLIOGRAPHY

Dr Nkporbu A.K. is a Consultant Neuropsychiatrist in the University of Port Harcourt Teaching Hospital, and also a Senior Lecturer in the University of Port Harcourt. He is also a Neuropharmacologist, a Public Health Practitioner, and an international certified Addiction Practitioner.