Oluwabunmi Buhari, Department of Behavioural Science, Faculty of Clinical Sciences, University of Ilorin/ U.I.T.H., Ilorin, Oladimeji Bolarinwa, Department of Epidemiology & Community Health, Faculty of Clinical Sciences, University of Ilorin/ U.I.T.H., Ilorin, Alfred Adegoke, Department of Counsellor Education, Faculty of Education, University of Ilorin, Adebusola Ogunmodede, Department of Behavioural Science, U. I. T. H., Ilorin, Rotimi Oguntayo, Department of Psychology, Faculty of Social Sciences, University of Ilorin, Olushola Adegunloye, Department of Behavioural Science, Faculty of Clinical Sciences, University of Ilorin/ U.I.T.H., Ilorin, Michael Ajokpaniovo, Department of Counsellor Education, Faculty of Education, University of Ilorin, Johnson Oyeleke, Department of Psychology, Faculty of Social Sciences, University of Ilorin, Sylvia Malomo, Department. of Biochemistry, Faculty of Life Sciences, University of Ilorin.

Corresponding author: Oluwabunmi Idera Nimata Buhari, Department of Behavioural Science, Faculty of Clinical Sciences, University of Ilorin/ U.I.T.H., Ilorin. E-mail address: nimat.buhari@gmail.com

INTERNET-BASED PSYCHOLOGICAL INTERVENTIONS TO IMPROVE MENTAL HEALTH: PREFERENCE FOR AND WILLINGNESS TO USE AMONG STUDENTS IN A NIGERIAN UNIVERSITY

O. Buhari, O. Bolarinwa, A. Adegoke, A. Ogunmodede, R. Oguntayo, O. Adegunloye, M. Ajokpaniovo, J. Oyeleke and S. Malomo

ABSTRACT

Objective: To assess the willingness and preference for Internet-Based Mental Health interventions among university students using a validated self-administered questionnaire, the Mental Health Literacy Questionnaire (MHLq) and the General Health Questionnaire (GHQ-12).
Design: A cross-sectional multi-staged randomized study.
Setting: The setting was the University of Ilorin, Nigeria
Subjects: A total of 3,300 undergraduate students were assessed.
Main Outcome Measures: The Statistical Package for Social Sciences (SPSS) software was used for data analysis. Descriptive and inferential statistics, and regression analysis to predict factors associated with willingness and preference was done. Level of significance was set at p-value of 0.05 and confidence interval at 95%.
Results: Preference for Internet-Based Mental Health intervention compared to Face-to-Face intervention was 27.7% amongst the 3,179 analyzable questionnaires, while 48.6% respondents were willing to use Internet-Based Mental Intervention. Predictors of willingness to use internet-based support were monogamous family setting (aOR= 1.486), help seeking behaviour (aOR= 2.683) and probable mental illness (aOR= 0.333) while predictors of preference for Internet-Based Intervention over Face-to-Face therapy were younger age (aOR= 1.377), female gender (aOR =1.342), satisfactory relationship with mother

and father (aOR = 1.607. 1. 466 respectively), self-help strategies (aOR= 0.713) and good knowledge of mental health (aOR =1.610).

Conclusion: **Internet-Based Interventions is a viable choice for improving university students' mental health. Further studies may explore acceptability and use of different aspects of internet-based interventions.**

INTRODUCTION

University students are high-risk group for mental disorders due to the challenging academic and psychosocial developments they experience. [1] Prevalence rates ranging between 12-46% have been reported[1-4] with an average duration of untreated mental disorders lasting about 4-23 years and associated with long-term negative outcomes such as poor academic performance, drop-out from school, reduced workforce participation and lost productivity.[5]

 Despite availability of several cost-effective treatments, there remains a substantial treatment gap in low- and middle-income countries (LMIC) where most of those ill do not get required intervention, and this being worse for the younger age-group.[6] Reasons for the treatment gap include stigma, poor mental health literacy, and lack and/or maldistribution of resources.[6]

Studies among University students have found that about 1 in 3-5 of students with mental illness get the help they require and those receiving treatment get minimally adequate treatment.[1,4,5] Reasons include a lack of knowledge about availability of the services and/or its location, lack of awareness of a need for mental health support and lack of time.[1, 5]

Advancements in digital technologies and its potential application in facilitating mental well-being and prevention of mental illness offer treatment options. Digital technologies are widely used by youths and could help to overcome the limitations offered by the more traditional, physical contact therapeutic options.[7-10] As a relatively new model of intervention in Nigeria, there a need to identify factors which may promote and/or hinder its appeal to the university students.

This study is part of a larger three-phase research on university students' mental health.[11] The aim of this study was to assess university students' willingness and preference to use of internet-based psychological services (IBMI) and the relationships with sociodemographic variables, mental health literacy and psychiatric morbidity.

MATERIALS AND METHODS

Study setting and design: This was a cross-sectional study carried out at the University of Ilorin (Unilorin), Kwara State, Nigeria.

Sample size and Sampling methods: A total of 3,300 students were sufficient to detect a 5% error rate after adjustments for finite population and multiple levels of sampling techniques. A multi-stage stratified sampling across departments per faculty using proportional allocation based on students' strength per level of study.

All regular full-time undergraduates were eligible for inclusion. Entry level undergraduate students and those absent from class at time of administration of questionnaire were excluded.

Study instruments and Data Collection: We used a self-administered questionnaire divided into various sections including willingness to have Internet-Based Mental Health Interventions, the Mental Health Literacy Questionnaire (MHLq) for young adults[12] and the General Health Questionnaire (GHQ-12). [13, 14] Trained research assistants distributed and collection

of the questionnaires. The study spanned between December 2019 and February 2020.

Ethical consideration: Ethical clearance was obtained from the University and informed consent from respondents was obtained. A contact note was provided for those who desired mental health consultation afterwards.

Data Analysis: The Statistical Package for Social Sciences (SPSS) version 20 software was used for analysis. Descriptive and inferential statistics, and regression analysis to predict factors associated with willingness, and preference for IBMI were used. Level of significance was set at p-value of 0.05 and a confidence-interval of 95%.

RESULTS

Of 3,300 questionnaires distributed, 3,179 (96.33%) were returned complete and analyzable. A total of 1,610 (50.6%) of the respondents were males while the remaining 1569 (49.4%) were females. Their age ranged between 15-34 years with mean age of 20.69 (SD ± 2.51). They were mostly from the Yoruba tribe (88.5%) and single (97.9%). About half were Muslims (50%), mostly from monogamous family (83.9%) and lived on-campus (61.2%). Only 262 (8.2%) respondents had previous episodes of psychological problems. Of these, 78 (29.8%) sought orthodox treatment, 131 (50.0%) traditional treatment while the remaining 53 (20.2%) used religious treatment. Of those with previous episodes of psychological problem, 45.5% were still on treatment. Only 3.2% of respondents had chronic physical problems, of which 50.5% sought orthodox treatment, 28.7% sought traditional treatment while the remaining 20.8% sought religious treatment.

About a quarter (879) of the respondents (27.7%) preferred the use of Internet-Based Interventions (IBMI) to traditional Face-to-Face (FTF) interventions. However, about half (1544) of the respondents (48.6%) were willing to use IBMI service if provided.

The association between preference for IBMI and socio-demographic characteristics is as shown in Table 1. Preference for IBMI was found to be significantly associated with mean age (p= 0.003), gender (p= <0.001) and accommodation status (p= 0.003) of students. About a third of females (31.3%) and those who lived off campus (30.6%) preferred IBMI. Although the preference for use was found to be higher among those who were married (37.3%), the association between marital status and preference for IBMI was not statistically significant (*p* value 0.074).

Mean age (p=0.001), gender (P= 0.028) and the year of study of the students (P= <0.001) were significantly associated with willingness to use IBMI. Willingness to use IBMI was more among students in the age group 21-25 years (54.3%), the males (50.5%) as well as the students in 200L (57.1%).

Table 1

Association between socio-demographic variables and willingness and preference to use internet based psychological services

Variables	Willingness to use IBMI			Preference for IBMI		
	Yes (%) n=1544	No (%) n=1635	*p*-value	Yes (%) n=879	No (%) n=2300	*p*-value
Age (years)						
< 21	890(49.3)	917(50.7)	0.005	534(29.6)	1273(70.4)	0.006
≥ 21	745(54.3)	627(45.7)		345(25.1)	1027(74.9)	
Mean ± SD	20.54±2.39	20.83±2.61	0.001	20.47±2.27	20.77±2.59	0.003
Range	15–31	15–34				
Gender						
Male	813(50.5)	797(49.5)	0.028	388(24.1)	1222(75.9)	< 0.001
Female	731(46.6)	838(53.4)		491(31.3)	1078(68.7)	
Marital Status						
Single	1511(48.6)	1601(51.4)	0.910	854(27.4)	2258(72.6)	0.074
Married	33(49.3)	33(50.7)		25(37.3)	42(62.7)	
Year of study						
200 L	339(57.1)	255(42.9)	< 0.001	151(25.4)	443(74.6)	0.052
300 L	358(48.8)	376(51.2)		190(25.9)	544(74.1)	
400 L	578(48.3)	619(51.7)		335(28.0)	862(72.0)	
500 L	218(43.2)	287(56.8)		165(32.7)	340(67.3)	
600 L	51(34.2)	98(65.8)		38(25.5)	111(74.5)	
Accommodation status						
On campus	943(48.5)	1003(51.5)	0.876	502(25.8)	1444(74.2)	0.003
Off campus	601(48.7)	632(51.3)		377(30.6)	856(69.4)	
Faculty						
Arts	590(48.6)	625(51.4)	0.994	337(27.7)	878(72.3)	0.932
Sciences	954(48.6)	1010(51.4)		542(27.6)	1422(72.4)	

Parental status, family structure, relationship with father, mother and occupation of the father (p values <0.05) were significantly associated with preference for IBMI. The preference was higher among students whose parents were deceased (44.8%), those from polygamous homes (35.4%), whose relationship with father and mother was satisfactory (28.8% and 28.1% respectively) and whose fathers were employed (27.9%).

More students from monogamous family structure were willing to use IBMI (*p* value 0.019). Membership and support from social groups were also found to have a significant association with willingness to use (p values <0.001). The type of support, tuition status, previous psychological problem and current medical conditions (p values <0.05) were significantly associated with willingness to use IBMI. More than half of those who were not on scholarship (52.2%), who have had a previous episode of psychological problem (56.9%) and who have chronic medical conditions (62.4%) were willing to use IBMI.

Table 2

Association between MHLs, psychological distress, willingness to use and preference for internets based psychological support

	Willingness to use IBMI			Preference for IBMI		
Variables	Yes (%) n=1544	No (%) n=1635	*p*-value	Yes (%) n=879	No (%) n=2300	*p*-value
Help seeking behavior						
Poor	359(43.6)	464(56.4)	0.001	240(29.2)	583(70.8)	0.260
Good	1185(50.3)	1171(49.7)		639(27.1)	1717(72.9)	
Self-help strategies						
Poor	308(42.9)	410(57.1)	0.001	221(30.8)	497(69.2)	0.033
Good	1236(50.2)	1225(49.8)		658(26.7)	1803(73.3)	
Knowledge of mental health						
Poor	277(46.4)	320(53.6)	0.239	137(22.9)	460(77.1)	0.004
Good	1267(49.1)	1315(50.9)		742(28.7)	1840(71.3)	
Erroneous beliefs/ Stereotype						
Poor	270(39.0)	423(61.0)	<0.001	185(26.7)	508(73.3)	0.525
Good	1274(51.2)	1212(48.8)		694(27.9)	1792(72.1)	
Mental health literacy score						
Mean ± SD	52.59±10.51	51.38±10.91	0.002	52.42±9.97	51.80±11.01	0.142
Psychological distress (GHQ)						
Negative	1290(53.1)	1140(46.9)	< 0.001	221(29.5)	528(70.5)	0.194
Positive	254(33.9)	495(66.1)		658(27.1)	1772(72.9)	

In Table 3, self-help strategies and knowledge of mental health were found to be significantly associated with preference for IBMI (*p* value 0.033 and 0.004 respectively). Preference for IBMI was more with those with poor self-help strategies (30.8%) and among those with good knowledge (28.7%) of mental health.

Help seeking behavior, self-help strategies, erroneous beliefs/stereotypes and psychological distress were found to be significantly associated with willingness to use IBMI (*p* values <0.05). About half of students with good help seeking behavior (50.3%), good self-help seeking strategies (50.2%), and good beliefs (51.2%) were willing to use IBMI. The overall mental health literacy score was found to be significantly higher among students who were willing to use IBMI (*p* value = 0.002).

Two hundred and Fifty-Four (254), representing 33.9% of those with a probable current psychological disorder compared to about half (53.1%) of those without, were willing to use IBMI. This was statistically significant with a *p* value = <0.001.

The predictors of preference of IBMI over FTF interventions using binary logistic regression were age, gender, year of study, accommodation, relationship with parents, employed fathers, use of self-help strategies and knowledge of mental health.

Students less than 21 years of age (aOR: 1.377, 95% CI: 1.163- 1.630) had higher odds to prefer the IBMI as compared with those who were 21 years and above. Females were 1.3 times more likely to prefer to use IBMI as compared to males; those who were in 500L compared with the 200L students (aOR: 1.425; 95% CI: 1.088 – 1.867); those whose

fathers were employed (aOR: 2.732, CI:1.283-5.817) and; those with good knowledge of mental health (aOR:1.604, CI: 1.264-2.035). Lesser odd of preference was found among students who lived on campus (aOR 0.795, CI: 0.675-0.936), whose parents were alive (aOR:0.509, CI: 0.338-0.765)), those from monogamous homes (aOR: 0.63, CI: 0.518-0.784)7) and those with good self-help strategies (aOR = 0.711, CI: 0.576-0.877).

Family structure, financial support, help seeking behaviour and psychological distress remained statistically significant independent predictors of willingness to use IBMI. Students from monogamous family (aOR: 1.516, CI 1.111-2.068) and those with good health-seeking behavior (aOR:2.798 CI: 2.003-3.908) had higher odds of willingness to use IBMI while those who enjoy financial support (aOR: 0.469, CI 0.318-0.692) and those with current probable psychological distress (aOR: 0.317, CI: 0.234-0.429) had lesser odds.

DISCUSSION

Our study assessed preference and willingness for IBMI among University students and also determined the factors affecting the preferences and willingness to use. Although we found a preference of 27.7% for IBMI compared to FTF intervention, about half of our respondents (48%) were willing to use and pay for IBMI if provided. We found a lack of research on preference for IBMI in Nigeria. However, globally, there are few research exploring preferences for use of IBMI in the general population and much fewer in university students. The major finding was a willingness to use IBMI despite a greater preference for FTF interventions, just as found in our study.[9,15,16]

In a study done by Batterman, although 71% respondents preferred FTF interventions for emotional or personal problems, about 71% of same sample also reported the likelihood of using on-line program for mental health intervention.[15] Another study found 47% of university students were likely to use IBMI if offered.[16] Notwithstanding the few limitations to IBMI such as concerns about privacy of personal information and difficulty of communicating effectively in online setting, University students found it acceptable because it allows them remain anonymous and the intervention can be accessed from different variety of devices from the comfort of their personal space and location at a flexible time.[8,9,16]

This study found that age was a significant predictor of preference for IBMI with the younger age group (< 21years) having a higher odd (OR = 1.377) of preference compared with the older ones. This supports the idea that youths relate more with web-based interactions. Youths are technologically savvy, find it easier navigating the net, and are more comfortable connecting with and talking about their problems using an online medium.[8-10,16]

Female gender, people who had better parental relationships, and whose father were employed, were more likely to prefer IBMI in our study. Studies have produced mixed results with relationships between socio-demographics and preference for IBMI.[8,15,16] While some studies supported higher number of females engaging in IBMI, others have reported no difference. Although in our study males were more willing to use the internet, females had a higher odd for preference (OR 1.382) when compared with males.

A study in adolescents found that males were 1.7 times more likely to prefer IBMI.[18] However, being female has been reported to be associated with self-selection of participants and over-representation of females in IBMI studies. [15,17] These may be adduced to the fact that females, as a result of gender sensitivity to sick-role, are more likely to talk about their feelings and mental health interventions.[19] Also, in many developing

countries, some females may not have autonomy and are therefore dependent on others for cost of care,[20] this means they lack privacy and confidentiality in traditional FTF therapy, so may opt for internet-based interventions. Studies have assumed that males may find on-line intervention easier than FTF interventions because they generally do not like to talk about their problems in FTF settings.[15]

Our finding suggests that both on-campus and off-campus students may benefit from IBMI. Although a significant proportion of off-campus students preferred IBMI over FTF intervention (p value = 0.003), close to half of the students on both on-and off-campus were willing to use IBMI (48.6%). Incentive for use maybe that students receive both free and subsidized internet services while on campus ground. The cost of living outside school campus is usually higher as transportation is an added cost.

We found no relationship between IBMI and marital status. This may be due to the over-representation of single status in our data with the proportion of married respondents too small to make a difference. This differs from another study in a general adult population which found a lower odd (1.42) for preference for internet use in those who were single.[9]

Better parental relationship and fathers gainfully employed were significantly associated with preference in this study and may connote more financial support and better access to data. Financial incentive is a factor that has been found to facilitate participation in IBMI.[15] Access to supportive social networks has been found to be a predictor for student's response to use of IBMI in previous studies.[15]

Respondents who had previous episodes of psychological disorders had higher odd (OR1.121 CI: 0.731-1.721) of willingness to use IBMI. Although there was a significant association at the bivariate level, having a previous episode of psychological disorder was not a significant predictor of willingness to use IBMI.

Previous episode may connote previous knowledge of use of IBMI as they may have searched the net as a form of help-seeking behavior. They may also have had experience using virtual means of support in the past. Having used it in the past may mean better understanding of advantages of virtual interventions over FTF interventions. Studies comparing people with past or current mental illness preference have produced mixed results. While some studies[10,16] found a considerable proportion of people with previous psychological problems were willing to use IBMI[9], others [8,15] have found no significant difference in previous or current mental health status. Most studies that assessed acceptability of IBMI in people with past or current psychiatric morbidity often used online sample or people already in treatment programs. This may question the representativeness of the sample and it may be a source of bias,[8] as such findings may not be reflective for the general population. Such individuals may have overcome the barriers relating to such intervention having had practical experience.[8]

Findings in our study suggests that our university students with a better global mental health literacy were more willing to use IBMI if it was provided (p value = 0.002). Youths with less stigmatizing attitudes to mental health have been found to have more positive help-seeking attitudes generally and they are also more likely to use the internet.[8] In this study, holding lesser erroneous belief about mental illness significantly influenced willingness to use IBMI. Poor mental health literacy, stigma and holding erroneous belief are instrumental to poor health-seeking behaviours.[6] Any efforts to improve health-seeking behaviours and availability of treatment options must first address mental health literacy. Any intervention, no matter how effective, if not acceptable would be of no use to those it is intended to serve.[11,15] It is

important that we first improve the mental health literacy of the university population as part of our efforts to improve mental wellbeing, increase treatment options and use.

The strength of the study lies in the fact that it was a substantial large sample size and the first of its kind in our university environment, locally and nationally. The findings will serve as a critical preliminary data on which subsequent phases of development of IBMIs for the students can be built upon.

Limitation: This study was a cross-sectional study as such, the findings may not predict respondents' preference over a period of time. It may also not be reflective of cause and effects. This report did not enquire about preference for specific types of internet interventions. A mixed study may allow for more in-depth exploration of preferences for specific type IBMI. Further research may explore concerns and limitations to the effective use IBMI and determine the best-fit digital intervention so that students can optimize the acceptability and use of online interventions.

CONCLUSION

It is our conclusion that Internet-based mental-health resources have huge potentials for effective delivery of mental health intervention in university students in Nigeria. It may serve as an alternative for those who do not want the traditional face to face intervention. Its use even become more relevant during the era of Covid-19 pandemic and limited physical contacts.

REFERENCES:

1. Pereira S, Early N, Outar L, Dimitrova M, Walker L, Dzikiti C. eds. University student mental health survey 2020: A large scale study into the prevalence of student mental illness within UK universities. The Insight network & Dig-in. 2020

2. Nwefuru B, Otu M, Eseadi C. Stress, depression, burnout and anxiety among chemistry education students in Universities in South-East, Nigeria. *J Consult Train Serv.* 2018; 2:46–54.

3. Falade J, Oyebanji AH, Babatola O, Falade OO, Olumuyiwa TO. Prevalence and correlates of psychiatric morbidity, comorbid anxiety and depression among medical students in public and private tertiary institution in a Nigerian state: a cross-analytical study. *Pan African Medical journal.* 2020; 37(53). 10.11604/pamj.2020.37.53.24994 E

4. Auerbach R., Mortier P, Bruffaerts R., Alonso J., Benjet C, Cujipers P, et al. Mental disorder comorbidity and suicidal thoughts and behaviors in the World Health Organization World Mental Health Surveys International College Student initiative. International Journal of Methods in Psychiatric Research, 2019; e1752. doi:10.1002/mpr.1752.

5. Wang PS, Berglund P, Olfson M, Pincus HA, Wells KB, Kessler RC. Failure and delay in initial treatment contact after first onset of mental disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*, 2005; 62:603–13. Doi: 10.1001/archpsyc.62.6.603.

6. Gureje O, Lasebikan VO, Kola L, Makanjuola VA. Lifetime and 12-month prevalence of mental disorders in the Nigerian Survey of Mental Health and Well-Being. *Br J Psychiatry*. 2006 May;188: 465-71. doi: 10.1192/bjp.188.5.465. PMID: 16648534.

7. Ofoegbu, TO, Asogwa, U, Otu, MS, Ibenegbu, C, Muhammed, A, Eze, B. Efficacy of guided internet-assisted intervention on depression reduction among educational technology students of Nigerian universities. Section Editor(s): Bush., Eric Author Information Medicine: February 2020 - Volume 99 - Issue 6 - p e18774 PMCID: PMC701563 doi: 10.1097/MD.0000000000018774

8. Palmer K. Undergraduate college students' attitude about internet based mental health interventions. 2015 Graduate theses and dissertations. http://scholarcommons.usf.edu/etd/5756

9. Wallin KE, Mattsson S, Olsson GM. The Preference for Internet-Based Psychological

Interventions by Individuals Without Past or Current Use of Mental Health Treatment Delivered Online: A Survey Study with Mixed-Methods Analysis. *JMIR Ment Health.* 2016; 3(2): e25 doi:10.2196/mental.5324

10. Montague A, Varcin K, Simmons M, Parker A. Putting technology into youths' mental health practice: young peoples' perspectives. *Sage Open.* 2015: 1-10

11. Buhari OIN, Bolarinwa OA, Adegoke AA, Ogunmodede AJ, Oyeleke J, Oguntayo R, Adegunloye OA, Malomo S. 2021. Comprehensive and integrative tertiary institution mental health (TIM-HEALTH) care: developing a protocol for Nigerian Universities. *International Journal of Public Health and Clinical Sciences. 8(2): 51-65.*

12. Dias, P., Campos, L., Almeida, H., Palha, F. Mental Health Literacy in Young Adults: Adaptation and Psychometric Properties of the Mental Health Literacy Questionnaire. *International journal of environmental research and public health.* 2018, 15(7): 1318. doi:10.3390/ijerph15071318

13. Goldberg, D. (1992). *General Health Questionnaire (GHQ-12).* Windsor, UK: NFER-Nelson.

14. Abiodun, O. A. A study of mental morbidity among primary care patients in Nigeria. *Comprehensive psychiatry, 1993; 34*(1): 10-13.

doi.org/10.1016/0010-440X(93)90030-8 Available online 6 April 2004.

15. Batterham PJ, Carlear AL. Preferences for internet based mental health interventions in an adult online sample: Findings from an online community survey. *JMIR Ment health. 2017;* 4(2): e26. https:/doi 10.21196/mental.7722: 10.2196/mental.7722

16. Ryan ML, Shochet IM, Stallman HM. 'Universal online interventions might engage psychologically distressed University students who are unlikely to seek formal help.' *Advances in Mental Health. 2010;* 9(1);78-83.

17. Donkin l, Christensen H, Naismith SL, Neal B, Hickle IB, Glozier N. A systematic review of impact of adherence on the effectiveness of e-therapies. *J Med Internet Res.* 2011;13(3): e52

18. Crisp, DA., Griffiths, K. M. Participating in online mental health interventions: Who is most likely to sign up and why? *Depression Research and Treatment.* 2014. https://doi.org/10.1155/2014/79045

19. Vlassoff C. Gender in equalities in health in third world. Uncharted ground. Soc. *Sci med.* 1994; 39:1249-59

20. Sen G., George A, Ostlim P. Engendering health equity? A review of research and policy. Harvard Center for Population and Development Studies Working Paper Series. 2002. 12:13