

# Anxiety and Anger Among Undergraduates Students During Second Nationwide Covid-19 Lockdown in Western Uganda

## Abstract

**Objective:** Anxiety and anger are one of the most neglected mental health conditions, hence often undetected and untreated. The present studies investigated the Anxiety and anger burden and knowledge of UGS on mental health care services.

**Methods:** A cross-sectional descriptive study was undertaken amongst UGS above the age of 18 in western Uganda. A closed-ended questionnaire uploaded on google form was used to collect data from the respondents (n=196). Modified generalized anxiety disorder (GAD-7) and Spielberger's State-Trait Anger Expression Inventory-2 (STAXI-2) were used to assess anxiety and anger respectively.

**Results:** Few UGS (47.4%) knew about COVID-19 mental health care services. UGS who had knowledge about mental health services had low levels of anxiety ( $R = 0.010$ ;  $P = 0.894$ ) and anger ( $R = -0.025$ ;  $P = 0.724$ ) with increasing age. However, anxiety and anger increase with age among female UGS but reduce in males. UGS with partners had high levels of anxiety and anger during lower age levels (below the 20s) and these decrease with aging and this relationship is inverse in their single counterparts.

**Conclusions:** Generally, most UGS in western Uganda are not knowledgeable about mental health care services, therefore, suggesting more work on the path of policymakers in alleviating the possible mental health impact of possible future outbreaks as previous campaigns have mostly focused on health care workers.

**Keywords:** Mental health burden, Mental health care, Covid-19 lockdown, Western Uganda

## BACKGROUND

The Coronavirus disease of 2019 (COVID-19) pandemic was declared a global health emergency (Li et al., 2020), with a great impact on every aspect of human endeavors (Usman et al., 2020). The recommended quarantine restrictions and social distancing measures greatly affected various categories of people in the African continent (Kasozi et al., 2020). Previous research on the psychological effects of pandemic-associated quarantine involving MERS (Middle East Respiratory Syndrome) and SARS (Severe acute

respiratory syndrome) correlated obstructive social interaction, suspension of recreational activities with PTSD (posttraumatic stress disorder), anger, anxiety, and subtle bipolar behavioral orientation (Kavanagh et al., 2012; Reynolds et al., 2008).

One of the most ignored mental health issues, anxiety and rage are frequently undiagnosed and mistreated. Anxiety and rage frequently coexist, with anxiety occasionally leading to annoyance or even rage if it is not addressed (Tarantino et al., 2013). Anger is a common emotion in people with anxiety disorders, but the connection between anger and anxiety can often be overlooked or missed (Tarantino et al., 2013).

Studies have found a meaningful association between age, knowledge, and mental health, where knowledge of accurate mental health information, precautionary measures, and maturity (age) were shown to improve positive attitudes toward mental health and reduced psychological impact (Milin et al., 2016). Elderly persons are more predisposed to epidemic-related medical conditions including mental health issues related to epidemics (Milin et al., 2016; Vahia et al., 2020; Yip et al., 2010). Previous studies regarding mental health associated with the epidemics have indicated that there are sex differences regarding psychological responses with variable levels of stress, anxiety, and depression (Crawford & Gosling, 2004; Wang et al., 2020). The contributing factors for the gender differences of the epidemic-related mental health burdens could be biological, social, among others that invariably impact the physiological, cognitive, and behavioral responses of individuals (Bernhardt et al., 1998)(Stroud et al., 2002). The variable role of marital status in mental health related problems has been shown in single individuals and those with partners, where the two groups show different impact levels regarding epidemically-related mental health burdens (Lemuel et al., 2021).

Currently, only scanty data exists regarding COVID-19 and anxiety and anger status among university students (UGS) in the African continent, particularly in Uganda. Emphasis on mental health-related challenges during the campaign against the spread of SAR-COV-2 focused on healthcare workers (Bao et al., 2020; Kang et al., 2020; Li et al., 2020), with consequent neglect of other vulnerable persons including UGS were greatly impacted following the closure of educational spaces. The present studies investigated Anxiety and anger burden and knowledge on health care services among UGS in Western Uganda.

## **METHODS**

### ***Study site and design***

This was a cross-sectional study conducted among 196 UGS in Bushenyi district of Western Uganda above the age of 18 during the second phase nationwide lockdown in Uganda. Students from both Kampala International University, Western Campus and Valley University of Science and Technology who consented to participate in the study were allowed to participate in the study.

### ***Sample size determination***

Sample size for the present study was determined using Raosoft sample size calculator (<http://www.raosoft.com/samplesize.html>), at a 95% confidence interval, an error margin of 7.0%, population size of 20000, and a response distribution of 50%. We approximated the number to 196.

### ***Data collection tool***

A structured close-ended questionnaire was used for the data collection. The questionnaire captured the socio-demographic features of the respondent, modified tools were used to measure awareness of mental health care, generalized anxiety and anger. Awareness of mental health care was assessed using simple questions and each of the options provided were assigned scores. Anxiety was assessed using a modified generalized anxiety disorder (GAD-7) item tool (Bystritsky et al., 2008). Each of the responses attracted scores. Anger was assessed using a modified Spielberger's State-Trait Anger Expression Inventory-2 (STAXI-2) (*State-Trait Anger Expression Inventory-2 (STAXI-2) - Statistics Solutions*, n.d.). Responses for each question were assigned scores (Figure 1). The generated questionnaire was uploaded online in google form and with shared with respondents to be filled.

The internal consistency for the different segments of the questionnaire (GAD-7, STAXI-2, and knowledge of mental health care services), Cronbach's  $\alpha = 0.79, 0.85, \text{ and } 0.86$  respectively, was determined by the statistician in the research group.

### ***Data collection method***

The initial draft of the questionnaire was sent to different experts (psychiatrists, sociologists, and statisticians) for face and content validity. The questionnaire was pretested among 10 respondents and remodeled to a final tool and was made available online, using google form online resource (via docs.google.com/forms). In the end, 257 responses were retrieved, 41 responses were excluded because greater than 25% of the required pieces of information were missing.

## ***Data management***

The data obtained from the survey were entered into Microsoft Excel (2016) and scores, and grades were assigned to assessment variables. Since the questionnaire was self-administered. Data collected were assessed for completeness, and responses failing to meet the 75% cut-off (on all valid questions) were excluded. No adjustment was made to any categorical variable.

The coding for the various sections were provided as follows: Socio-demographic characteristics (Q1-Q5) entered into excel included sex (male/female), marital status (single/married/divorced/separated) recoded to relationship status (married=partner, single/divorced/separated=no-partner). The response variables anxiety (score & level) and anger (score & level) were the mental health state of interest, while knowledge of mental health care services (K-MHCSPORTS) was an intervening variable. Sex and relationship status were the categorical factor and age was the continuous factor. Mental Health Care Knowledge was obtained as a binary attribute of YES (1) or NO (0). Modified GAD Assessment of Anxiety (Q11, Q12 & Q14): Numerical values – Multiple response [For each option selected = 1, indifferent = 0]., while Q13 was closed-ended [Yes =1, No=0]. Modified STAXI-2 Assessment for Anger (Q15 – Q17): Numerical values – Multiple response [For each option selected = 1, indifferent = 0]. The scores of the multiple options for the modified GAD, and STAXI-2 were obtained by assigning one (1) mark per response, and the averages were obtained by summing all scores (qt) and dividing by the weight (n). While BDI had four (4) options graded as 3, 2, 1, and 0 (for indifferent). This provided the score (score), which is then rated (\_name of condition; knowledge, anxiety, or anger) using preestablished cut-offs; to determine the level of mental state (No/low, moderate, or severe). This scoring and grading system allows for both linear and uni/multivariate analysis (Figure 1).

## ***Data Analysis***

The data was transferred and entered into STATGRAPHICS centurion XVI version 16.1.11 (StatPoint Tech., Inc.), which was used to build a relationship model for Knowledge, Anxiety & Anger using Multiple Correspondence Analysis (Burt option). Comparison of Regression Lines analysis was used to observe the relationship between age, awareness, anxiety, and anger stratified using the socio-demographic variables. All analyses were performed at a 95% confidence level and p-values less than 0.05 were taken to be significant. Burt option of the multiple Correspondence Analysis was used to model the relationship between the three (3 key) variables; knowledge, Anxiety, and Anger.

## RESULTS

### ***Knowledge of mental health care services***

Table 1 represents the Burt description of variable interaction, therefore showing how frequently pairs of categories for two variables occur together. Few UGS (47.4%) knew of mental health care services (Table 1).

### ***Dimensions of variability***

The scree plot in Figure 2 shows the Eigen analysis of the correlation matrix for the Multiple Correspondence Analysis (MCA) of target variables entered into the models. From the graph, it was observed that only two dimensions (Dims) in the models explain the variance, therefore only Dim 1 and Dim 2 were considered in the analysis (Figure 2). The Inertia and Chi-Square Decomposition table was used to describe how many dimensions are needed to explain most of the differences among the categories. A tabular description of primary interest is the Cumulative Percentage column, which shows the percentage of total variability explained by Dim1, Dim1&2, Dim1, 2 &3, and so on. In this case, the first 2 dimensions explain 72.45% of the variability (Table 2).

### ***Relationships between variables in Dim 1 and Dim 2***

The MCA Map is a 2D-graphically explanation of the correlation of variables in Dim1 & Dim2 and as observed, the various level of mental health (anxiety and anger) correlated in their dimensions; moderate levels of anxiety & anger and high levels of anxiety and anger were clustered within the same area, while no knowledge of MHC was clustered with results low anxiety and anger (Figure 2).

### ***Relationship between anxiety and anger levels, age, and knowledge of mental health care service***

From the correlation result in Table 3, the linear relationship between age & anger was not significant but negative ( $r=-0.025$ ,  $P=0.724$ ), while anxiety was positively but not also significant as anger ( $r=0.01$ ,  $P=0.894$ ). However, anxiety & anger were strongly (positively) correlated ( $r=0.625$ ,  $P<0.001$ ). UGS who had knowledge about mental health care services had low levels of anxiety ( $R = 0.010$ ;  $P = 0.894$ ) and anger ( $R = -0.025$ ;  $P = 0.724$ ) with increasing age (Figure 3 & Table 3).

### ***Relationship between anxiety and anger levels, age, and sex***

The influence of sex on anxiety and anger with increasing age do not favor females when compared to males. As age increased, anxiety and anger were reduced in males but increased in females (Figure 4).

### ***Relationship between anxiety and anger levels, age, and relationship statuses***

At lower ages (below the 20s) individuals with partners had more levels of mental health burdens (anger and anxiety) than those without partners, but the individuals with partners had sharply decreased anxiety levels with increasing age and the reverse was observed for those without partners (Figure 5)

## **DISCUSSION**

The present study revealed that few UGS knew about mental health care services. UGS who knew about mental health care services had low levels of anxiety and anger with increasing age. However, anxiety and anger increase with age among female UGS. Respondents with partners had high levels of anxiety and anger at lower age levels (below the 20s), the observed decrease with age was inverse in their single counterparts.

The possible explanation for the observed insufficient knowledge about mental health care services among UGS may be because the emphasis on mental health-related issues during the pandemic focused on health care workers, with consequent neglect of other vulnerable populations including UGS. Anger and anxiety complement each other within this study population, and this is important since multiple mental health burdens usually appear together in pandemic-related psychological effects observed in previous infectious

disease outbreaks (Kavanagh et al., 2012; Reynolds et al., 2008). Depression occurs with anxiety, stress, and loss of sleep (Rajkumar, 2020).

The study shows that the most important associations seen in our population that could be effective in improving anxiety and anger among UGS are dimensions 1 (high anxiety/high anger), and dimension 2 (low anxiety/low anger/no knowledge of mental health care services among UGS) that accounted for 72.45% of the variability amongst the categories. The study also shows that knowing about mental health care services is indispensable because having the knowledge was associated with low levels of anxiety and anger with aging concurring with the fact that age and knowledge are important variables that come with maturity (Milin et al., 2016). A well-informed older individual would prefer to calmly go through a mental situation when challenged than individuals who are getting old but do not understand the psychological negative effects associated with certain issues. There is a meaningful relationship between knowledge and maturity (age) and these improve positive attitudes toward mental health (Milin et al., 2016).

The relationship between sex and the burden of anxiety and anger with increasing age did not favour the female UGS when compared to male UGS in the present study. As age increased, anxiety and anger were reduced in males but increased in females. These could be explained by social and biological factors and how these affect the psychological response among the two sexes (Stroud et al., 2002). Our findings concur with the findings of Wang et al. (Wang et al., 2020) who associated the female gender with a greater psychological impact of the outbreak and higher levels of stress, anxiety, and depression. However, the present study contradicts the findings of Wang et al. (Wang et al., 2020) in that they reported no significant association between mental health, age, and marital status.

The interaction between relationship status, age, and anxiety levels was important in our study; at lower ages (below the 20s) individuals with partners had sharply decreased anxiety levels with increasing age and the reverse was observed in those without partners. At lower ages, those with partners are more vulnerable to poor mental health because they are predisposed to stressful events associated with young couples during their transition to parenthood such as intimate partner violence including but not limited to sexual violence, physical violence, threats or emotional abuse, and substance abuse among the young UGS (Sipsma et al., 2016). However, providing strategies for strengthening social support networks and relationships among young UGS is an effective way of improving mental health among these groups

(Sipsma et al., 2016). In general terms, single UGS are more predisposed to risky behavior predisposing them to mental health-related issues (Higgins et al., 2007) due to their poor social support network and lack of companionship (Higgins et al., 2007; Sipsma et al., 2016). Nevertheless, these theories need more exploration and validation in the context of sport related mental health issues before they can be used in policies to curb sports-related mental problems.

## CONCLUSIONS

Generally, most UGS were not knowledgeable about mental health care services. Knowledge of mental healthcare is indispensable considering its association with anxiety and anger level with aging. The age, sex, and marital status of the UGS variably influenced mental health burden among UGS during the pandemic, and as such should be considered during policy formation aimed at formulating psychological interventions to improve mental health related and psychological resilience among UGS.

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## List of Tables

**Table 1:** Burt description of variable interaction (demographically un-categorized)

Variables	K-MHCS		Anxiety level			Anger level		
	No	Yes	High	Moderate	Low/No	High	Moderate	No/Low
<b>K-MHCS.No</b>	103 (52.5)	n/a	7 (3.6)	19 (9.7)	<b>77 (39.3)</b>	5 (2.6)	13 (6.6)	<b>85 (43.4)</b>
<b>K-MHCS.Yes</b>	n/a	93 (47.4)	2 (1.0)	24 (12.2)	<b>67 (34.2)</b>	2 (1.0)	13 (6.6)	<b>78 (39.8)</b>
<b>Anxiety level.High</b>	n/a	n/a	9 (4.6)	n/a	n/a	5 (2.6)	2 (1.0)	2 (1.0)
<b>Anxiety level.Moderate</b>	n/a	n/a	n/a	43 (21.9)	n/a	2 (1.0)	12 (6.1)	29 (14.8)
<b>Anxiety level.Low/No</b>	n/a	n/a	n/a	n/a	144 (73.5)	0 (0)	12 (6.1)	132 (67.3)
<b>Anger level.High</b>	n/a	n/a	<b>5 (2.6)</b>	2 (1.0)	0 (0)	<b>7 (3.6)</b>	n/a	n/a
<b>Anger level.Moderate</b>	n/a	n/a	2 (1.0)	12 (6.1)	12 (6.1)	n/a	26 (13.3)	n/a
<b>Anger level.No/Low</b>	n/a	n/a	2 (1.0)	29 (14.8)	132 (67.3)	n/a	n/a	163 (83.2)

**Note:** Interactions between strata of similar variables are represented by n/a (not applicable) [interaction outcome of interest in bold blue]. **K-MHCS** = knowledge of mental health during COVID-19 associated with sports.

**Table 2:** Inertia and Chi-Square Decomposition

Dimensions	Singular value	Inertia	Chi-Square	%	Cum %	Histogram
1	<b>0.5535</b>	<b>0.3064</b>	<b>540.40</b>	<b>46.21</b>	<b>46.21</b>	*****
2	<b>0.4171</b>	<b>0.1739</b>	<b>306.83</b>	<b>26.24</b>	<b>72.45</b>	*****
3	0.3204	0.1026	181.04	15.48	87.93	****
4	0.2564	0.0658	116.01	9.92	97.85	***
5	0.1193	0.0142	25.11	2.15	100.00	*
<b>TOTAL</b>		<b>0.6629</b>	<b>1169.39</b>			

**Note:** %, percentage; Cum %, Cumulative percentage [bold blue are limits to Dim analysis].

**Table 3:** Spearman Rho correlation of age, anxiety, and anger

Correlations	Age	Anxiety
Anxiety	0.010	
P-value	0.894	
Anger	-0.025	<b>0.625</b>
P-value	0.724	<b>&lt;0.001</b>

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