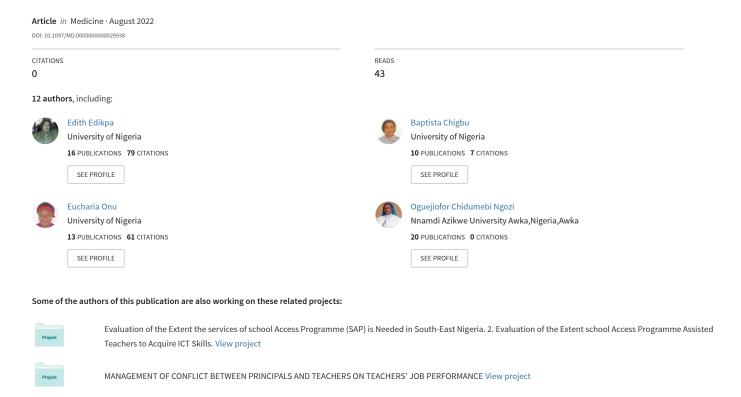# Assessing the general health, increase in mental and physical workload among administrative staff of the University of Nigeria due to the COVID-19 pandemic

12 authors, including:

Edith Edikpa
University of Nigeria
16 PUBLICATIONS **79** CITATIONS

SEE PROFILE

Baptista Chigbu
University of Nigeria
10 PUBLICATIONS **7** CITATIONS

SEE PROFILE

Eucharia Onu
University of Nigeria
13 PUBLICATIONS **61** CITATIONS

SEE PROFILE

Oguejiofor Chidumebi Ngozi
Nnamdi Azikwe University Awka,Nigeria,Awka
20 PUBLICATIONS **0** CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Project Evaluation of the Extent the services of school Access Programme (SAP) is Needed in South-East Nigeria. 2. Evaluation of the Extent school Access Programme Assisted Teachers to Acquire ICT Skills. View project

Project MANAGEMENT OF CONFLICT BETWEEN PRINCIPALS AND TEACHERS ON TEACHERS' JOB PERFORMANCE View project

Medicine

OPEN

Assessing the general health, increase in mental and physical workload among administrative staff of the University of Nigeria due to the COVID-19 pandemic

Edith C Edikpa, PhD[a], Baptista C. Chigbu, PhD[a],* , Amaka E Onu, PhD[a], Veronica N. Ogakwu, PhD[b], Mary C. Aneke, PhD[a], Bernadette N. Nwafor, PhD[a], Chinwe F. Diara, PhD[a], Honorius Chibuko, MED[a], Chidumebi N. Oguejiofor, MED[c], Grace N. Anigbogu, MED[a], Esther B. Adepoju, MED[a], Chiawa I. Igbokwe, PhD[c]

Abstract

The coronavirus disease 2019 (COVID-19) pandemic has changed the global workloads and general well-being of employees, especially in the university system. The object of this study is to evaluate the mental health and effect of increase in workload on the general well-being of the administrative staff of the University of Nigeria, Nsukka, on the resumption of academic activities after the lockdown due to COVID-19. A total of 73 randomly selected administrative staff were involved in the study. Three sets of instruments, the demographic questionnaire, National Aeronautics and Space Administration-Task Load Index, and General Health Questionnaire, were used to obtain information on the demographic characteristics, workload, and level of mental disorder among the respondents due to COVID-19. The generalized linear regression model, 1-way analysis of variance, independent samples *t* test, and contingency coefficient were used to analyze the data. The results revealed that high workload is significantly associated with high risk of mental and general health disorders among the respondents. The married, divorced, widowed, older, and females staff with >2 children are the most vulnerable to mental disorder, physical workload, frustration, and general health challenges. The younger staff, those with at most 2 children, and those who are still single experience lower mental and general health disorder and are more resilient. Significant and comprehensive health and administrative support should be provided for the overall well-being of the staff.

Abbreviations: ANOVA = Analysis of Variance, COVID-19 = coronavirus disease 2019, GHQ = General Health Questionnaire, IBM SPSS = International Business Machines Statistical Package for Social Sciences, NASA-TLX = National Aeronautics and Space Administration-Task Load Index.

Keywords: mental health, stress, university administrative staff, vulnerability, well-being

1. Introduction

The novel coronavirus, designated as coronavirus disease 2019 (COVID-19), which originated in the city of Wuhan in China and later spread rapidly to other parts of the globe as a deadly pandemic,[1–6] has affected office works and added stress to daily lives.[7–9] The pandemic, which hit Nigeria in late February 2020, necessitated the declaration and enforcement of general lockdown the following March to curtail the spread of the virus.[10] The lockdown was total as school activities were suspended indefinitely,[11] but the University of Nigeria, Nsukka, maintained the services of top administrative officers, from grade level 14 and above and those on essential duties (power, water, security, etc), for smooth running of the university community.

The lockdown and the pandemic had psychological, economical, mental, financial, and social consequences on the well-being of the administrative staff of the university, those under lockdown, and those who were coming to office in the midst of the pandemic. There was economic downturn in the country, global economic decline, acute food and water shortage, inability to access quality health care, loneliness, caring for loved ones, fear of contacting the virus, etc, which all culminated in emotional stress, anxiety, uncertainties, fear for one's life, etc.[9,12,13] Gradual lifting of the lockdown was initiated in August 2020 while higher institutions were among the last to be lifted, with all administrative staff of the universities resuming full office activities.[11]

The return to work was a big relief for many administrative staff of the University of Nigeria, Nsukka, who have had

varying traumatic experiences due to the lockdown and these experiences have taking their toll on their quality of life, mental health, and physical well-being. As pointed out by Laker,[14] employees are distressed due to the COVID-19 pandemic and are at breaking point, believing that the pandemic has severely affected their physical and mental well-being, leading to unprecedented increase in depression, anxiety, etc. Therefore, returning physically to work was with a lot of apprehension and uncertainty about adapting to new working protocols, workload, staying safe and fear of contacting the infection, job security, and economic hardship compounded by recession. With the distress already experienced by the population and notable rise in mental distress due to the pandemic, there is the risk that the staff returning to their offices will encounter another wave of unprecedented stress in the workplace.[12] Few months after the full resumption of academic activities in Nigeria, the study is aimed at evaluating the mental and physical stress levels of the administrative staff of the University of Nigeria, Nsukka. Also, the level of vulnerability and resilience to stress as well as the coping strategies in the workplace were investigated in the study.

Since the outbreak of the COVID-19 infection, many studies have focused on evaluating the effect of the pandemic on the stress level, workload, and general health of healthcare and nonhealthcare populations. Suka et al[15] conducted a web-based survey of the impact of COVID-19 on the general health, workload, and lifestyle of Japanese men and women. The moderating role of job control on the mental workload and job satisfaction among healthcare workers in Iran has been examined by Rostami et al.[16] The extent of COVID-19 work-related stress in hampering employee performances among bank employees during partial lockdown has been evaluated using social exchange theory.[17] The relationship between work stress, depression and anxiety symptoms, and change in work environment during the COVID-19 pandemic has been measured among nonhealthcare workers.[18] Efforts have been made to improve workplace stress and mental health profiles among employees during the pandemic.[19,20] The outcomes of most studies among health and non–health workers point to increase in workload, occupational stress, burnout, anxiety, distress, fatigue, frustration and health disorder, decrease in job satisfaction, general health, quality of life, and resilience due to the COVID-19 pandemic.[21–28]

Despite the large body of research on the impact of COVID-19 pandemic on the stress and burnout levels of healthcare and nonhealthcare workers, not much is known about its impact on university administrative staff, who had to be on duty most of the time during the lockdown due to the pandemic, especially in Nigeria. Therefore, this study is focused on measuring and evaluating the level of workload, mental distress, and general health among the administrative staff of the University of Nigeria, Nsukka, Nigeria. The period in focus is from November 2020, when schools reopened after the lockdown, to August 2021, the time of commencement of data collection for the study. The study is designed to ascertain the level of workload and general health of the administrative staff after the lockdown and identify the demographic, workplace, and COVID-19-related factors associated with increase in workload, mental disorder, burnout, stress, health disorder, psychological strain, and resilience among the employees. The findings of this study are expected to provide viable framework for effective management and improvement on burnout, stress, and health disorder among the administrative staff postpandemic.

The data used in this study are limited to only the administrative staff of the University of Nigeria, Nsukka, Nigeria, who bore the responsibility of ensuring safe return of students and staff to the university after the lockdown due to the COVID-19 pandemic was lifted in Nigeria. They ensured that adequate safety measures were put in place and that the international/World Health Organization specified safety measures were strictly adhered to. In the midst of the pandemic, this category of staff were scheduled to work some hours a week to ensure the smooth administration of the university community. Academic staff, students, and nonacademic staff who are not of the administrative units of the university were excluded from the study. The analysis was strictly based on the information obtained through the 3 instruments and no completed instrument was discarded or lost since the researchers adopted face-to-face administration of the instruments to the respondents.

2. Theoretical framework

The Social Exchange Theory by Cook et al[29] was adopted for this study. According to Saleem et al,[17] this theory gives a general knowledge of how workers are likely to respond when their psychological states are changed due to work pressures coming from the environment in which they do their work. The social exchange theory assumes the existence of reciprocal relationship between an employee and the work environment, which is predicated on cost-benefit analysis for making decision and comparing available options.[20] This present study possesses some elements of reciprocity whereby the administrative employees will give more if the work environment is organized to ensure their safety as well as their psychological, mental, and general well-being.

The social exchange theory provides the basis for this research through the exchange concept premised on the prevailing threat of the COVID-19 pandemic in the work environment. On return to work following lifting of lockdown, the administrative staff have to deal with so many documents in soft and hard forms, which have accumulated due to the long period of minimal administrative activities in the university. The enormous responsibility at the workplace compounds the psychological impact of the lockdown on the staff and this will lead to stress, burnout, anxiety, and health disorder and minimize the work efficiency. The exchange also manifests in the provision of appropriate work schedule, job sharing equity, and workplace safety protocols for the employees to promote safety and work efficiency. In this way, the administrative employees show more commitment and improved work performance with the perception of considerate and equitable distribution of work and protection against COVID-19.

3. Method

3.1. Sample and sampling technique

The research is a cross-sectional study of the administrative staff of the University of Nigeria, Nsukka, Nigeria. The study targeted all the different levels of the administrative staff of the university. The administration unit of the university is in focus in this study because of the strategic responsibility of smooth and safe return to full academic activities in the university postpandemic, which may exacerbate the already stretched mental and physical well-being of the staff. The G-Power software was used to obtain a sample size of 73 respondents at effect size of 0.275, P value of .05, and power of 0.95. Systematic sampling was used to select the 73 respondents to participate in the study from the records of administrative staff of the university obtained from the personnel services unit of the office of the registrar of the university. Systematic sampling was adopted due to its advantage in sampling a sequentially ordered population which, in this study, is the list of all the administrative staff of the university in the order of employment (sampling frame). After excluding the staff on study leave, sick leave, and leave of absence, the population for the study is 321. The sampling interval of 5 was obtained as the ratio 07 the study population and the sample size, while a random start of 4 (a number between 1 and 5 inclusive) was obtained from the table of random numbers. Therefore, the first respondent selected for the study has the serial number, 4, in the sampling frame. Subsequently, other

respondents were selected at intervals of 5 in the list. The names, phone numbers, and e-mail addresses of those selected for the study were secured from the records for easy contact for the study. Informed written consent to participate in the study was obtained from each of the selected participants.

3.2. Data collection

The collection data commenced on August 16 and ended on September 3, 2021, nearly 11 months after total lifting of lockdown and resumption of academic activities. The total (stage 3) lifting of the lockdown in Nigeria commenced on October 19, 2020, and lasted for 4 weeks. The major instrument for data collection is questionnaire distributed to the respondents by the researchers to obtain quantitative information on the overall mental and physical well-being of the respondents post COVID-19. There are 3 categories of questionnaire used in the study, which include the demographic questionnaire, National Aeronautics and Space Administration-Task Load Index (NASA-TLX) questionnaire, and the 30-item General Health Questionnaire (GHQ-30).

3.2.1. Demographic questionnaire. This component of the questionnaire is made up of the sociodemographic characteristics of the respondents, which include age, marital status, gender, relationship status, number of children, caring responsibilities (other dependents like aged/sick relative, yes/no), number of years in service, position in the office, highest educational qualification (Diploma, Bachelor, Masters, Doctoral, Professional), place of residence (inside/outside the campus), engaged in postgraduate/professional studies (yes/no), interest in the job (yes/no), increase in work pressure at the office due to the pandemic (yes/no/not sure), and worried about being infected with COVID-19 by a colleague in the office (yes/no/not sure).

3.2.2. NASA-TLX questionnaire. To assess workload among the respondents, the NASA-TLX questionnaire was used. The TLX questionnaire technique was developed by the Human Performance Group of the NASA Ames Research Center and is made up of 6 subscales as follows: mental pressure, physical pressure, temporal pressure, performance, effort, and frustration. The 20-step bipolar scales were then used to obtain ratings for these subscales. In this regard, the score of each scale was from 0 to 100. NASA-TLX score was also calculated by multiplying each subscale rate to its weight. Afterward, the overall workload was obtained by summing across scales and dividing by 15.[15,16] The higher the overall workload score, the higher the respondent's workload.[30] Independent validity assessment of the NASA-TLX questionnaire found the TLX to be a valid measure of subjective workload.[31,32] The Chronbach alpha reliability of the instrument has been established by Mohammadi et al[33] as 0.897. The categorization of the workload scores into "low workload" and "high workload" was adopted from Sugarindra et al.[34]

3.2.3. General Health Questionnaire. The GHQ-30 was used to evaluate the mental health (that is, the psychosocial well-being) of the respondents. The instrument was developed by Goldberg[35] and comprised of 30 items, out of which 15 are positively phrased and the other 15 negatively phrased. Although the initial GHQ is made up of 60 items, there currently exists a range of shorter versions of the questionnaire, which includes GHQ-30, the GHQ-28, the GHQ-20, and the GHQ-12. Among these shorter versions, the GHQ-30 is more balanced in terms of items for assessing the general well-being of the subjects of study and also easy to complete. Therefore, the GHQ-30 could be regarded as a measure of purely psychological or psychosocial symptoms, which are inherent in workplace stress. According to Klainin-Yobas and He,[36] the GHQ-30 captures 3 psychological factors, depression, anxiety, and social performance, and is a clearer measure of psychological symptoms. The instrument has been widely used, extensively validated, and translated into >30 languages.[37–40] Each item is rated on a 4-point scale (less than usual, no more than usual, rather more than usual, or much more than usual). The Goldberg original scoring method is the binary scoring of 0, 0, 1, 1, where the 2 least symptomatic answers are scored "0" and the 2 most symptomatic answers are scored "1."[41] These scores are used to generate a total score ranging from 0 to 30, with higher scores indicating worse situations.[42] The Chronbach alpha reliability coefficient of the instrument has been ascertained by Dale et al[43] to be 0.93. Also, the categorization procedure for the general health scores by Dale et al[43] was adopted to partition the respondents' health into "not at risk" and "at risk".

3.3. Statistical analysis

The categorical data from the studied groups were analyzed and compared using the chi-square measure of association, while the independent samples *t* test and analysis of variance (ANOVA) were used to analyze variable differences. Generalized linear models regression was used to analyze the influence of the sociodemographic and other variables on the levels of general health and workload. The generalized linear model with normal distribution and identity link function was used to analyze the impact of the sociodemographic factors on the general health of the respondents. The sociodemographic predictors of general health are age, marital status, gender, number of children, caring responsibilities, number of years in service, position in the office, highest educational qualification, place of residence, engaged in further academic studies, increase in work pressure at the office due to the pandemic, and worried about being infected with COVID-19 by a colleague in the office. The estimates of the model parameters were obtained through maximum likelihood estimation. The Wald chi-square test statistic was used to test for the model effects. The results of the Omnibus test ($P <$ .05) indicate that the overall generalized linear model is statistically significant and suitable to predict the general health of the administrative staff of the University of Nigeria, Nsukka. All statistical tests were conducted at .05 level of significance and a *P* value of <.05 was considered to be statistically significant. All the data collected and used in this study are available as Supplemental Digital Material (Table S2, Supplemental Digital Content, http://links.lww.com/MD/G932). The IBM SPSS version 26 and the NASA-TLX Calculator were used to facilitate the analysis of the data.

3.4. Ethical consideration

Approval to conduct the research was obtained from the Research Ethics Committee of the Department of Educational Foundations, Faculty of Education, University of Nigeria, Nsukka, and endorsed by the office of the Registrar of the university from whose office the participants were drawn. Also, the study was carried out in adherence to the 2008 principles and guidelines described in the Declaration of Helsinki for common ethical practices for clinical research.

4. Results

The demographic characteristics of the respondents were analyzed using frequencies and percentages and the results are summarized in Table 1. More of the respondents are females (54.8%) with the age distribution indicating that the respondents are mostly aged above 35 years (61.6 %), which is important to the study since stress increases with increasing age.[44,45] More than 60.0% of the respondents are married; >45.0% have >2 children, while >80.0% have caring responsibility (caring for

Table 1

Demographic characteristics of respondents.

Variable	Frequencies (percentages)			
Age (yr)	18–25	26–35	36–45	>45
	10 (13.7)	18 (24.7)	23 (31.5)	22 (30.1)
Gender	Male	Female		
	33 (45.2)	40 (54.8)		
Marital status	Married	Single	Divorced	Widowed
	44 (60.3)	20 (27.4)	3 (4.1)	6 (8.2)
Number of children	0–2	3–5	>5	
	39 (53.4)	21 (28.8)	13 (17.8)	
Caring responsibility	Yes	No		
	60 (82.2)	13 (17.8)		
Highest education	Certificate/Diploma	Bachelor's	Master's	Professional
	6 (8.2)	30 (41.1)	27 (37.0)	10 (13.7)
Years in office	<5	5–10	11–20	21–25 >25
	18 (24.7)	14 (19.2)	25 (34.2)	15 (20.5) 1 (1.4)
Residence	Quarters inside the university	Rented accommodation off-campus	Personal accommodation off-campus	Family house off-campus
	18 (24.7)	45 (61.6)	7 (9.6)	3 (4.1)
Further studies	Yes	No		
	54 (74.0)	19 (26.0)		
Increase in work pressure	Yes	No		
	71 (97.3)	2 (2.7)		
Position in office	Clerical staff	Technical Officer/System Analyst	Assistant/Deputy Director	Higher/Chief Executive Officer Director
	5 (6.8)	8 (11.0)	37 (50.7)	13 (17.8) 10 (13.7)

the sick and/or elderly family member). Also, 50.7% have master's degree and/or professional certification; 74.0% are engaged in further academic studies, while 97.3% experienced increased work pressure.

The results of the Wald chi-square tests for model effects (Table 2) show that age, gender, marital status, highest educational qualification, years in service, place of residence, further academic studies, and worry about being infected by colleagues are the characteristics of the respondents which significantly ($P < .05$) influence the general health of the respondents.

The Wald chi-square parameter estimates at 95% Wald confidence interval (see Table S1, Supplemental Digital Content, http://links.lww.com/MD/G931) identified the categories of the factors that are significantly influencing the general health of the respondents. These parameter estimates show that the demographic categories which significantly affect the general health of the respondents are 18 to 25 years (parameter estimate = −0.634, $P = .00$) and 26 to 35 years for age (parameter estimate = −0.445, $P = .00$); male (parameter estimate = −0.129, $P = .02$) for gender; married for marital status; Certificate/Diploma (parameter estimate =

0.792, $P = .039$) for highest educational qualification; living in quarters inside the university (parameter estimate = −0.526, $P = .028$) for place of residence; engaged in further academic studies (parameter estimate = −0.141, $P = .043$); and worried about being infected with COVID-19 by colleagues (parameter estimate = 0.332, $P = .008$). These results further indicate that not all age, gender, marital status, educational levels, and places of residence categories directly influenced the general health of the respondents.

Similarly, the generalized linear model was used to analyze the effects of the sociodemographic predictors on the workload. The model parameters were estimated using maximum likelihood, while the Wald chi-square test was used to test for the model effects at .05 level of significance. The Omnibus test result, with P value less than the level of significance ($P < .05$), also indicates that the generalized linear model is statistically significant and suitable for predicting the workload of the respondents. The results of the Wald chi-square analysis on the estimates of model effects are displayed in Table 3. The results in the table reveal that only the number of years in service and

Table 2

Results of Wald test of model effects for general health.

Demographic characteristics	Wald chi-square	df	P value
(Intercept)	13.311	1	.000
Age of respondents	20.739	3	.000
Gender	5.401	1	.020
Marital status	3.522	3	.031
Number of children	1.266	2	.531
Caring responsibility	1.739	1	.187
Highest educational qualification	7.828	3	.050
Position in the office	5.363	4	.252
Number of years in service	10.052	4	.040
Place of residence	9.505	3	.023
Engaged in further academic studies	4.110	1	.043
Increase in work pressure due to COVID-19	0.583	1	.445
Worried about infection from colleagues	6.979	1	.008

Omnibus = 120.739, $P = .00$.
COVID-19 = coronavirus disease 2019, df = degree of freedom.

Table 3

Results of Wald test for model effects of workload.

Demographic characteristics	Wald chi-square	df	P value
(Intercept)	18.231	1	.000
Age of respondents	3.406	3	.333
Gender	1.816	1	.178
Marital status	0.332	3	.954
Number of children	0.399	2	.819
Caring responsibility	2.532	1	.112
Highest educational qualification	1.050	3	.789
Position in the office	4.672	4	.323
Number of years in service	14.340	4	.006
Place of residence	2.082	3	.556
Engaged in further academic studies	0.880	1	.348
Increase in work pressure due to COVID-19	4.701	1	.030
Worried about infection from colleagues	2.258	1	.133

Omnibus = 83.436, $P = .000$.
COVID-19 = coronavirus disease 2019, df = degree of freedom.

increase in work pressure due to COVID-19 significantly predict the workloads of the administrative staff under study. The results of the parameter (see Table S1, Supplemental Digital Content, http://links.lww.com/MD/G931) estimates show that only those who have spent between 21 and 25 years in service (parameter estimate = 0.606, P = .019) and increase in work pressure due to COVID-19 (parameter estimate = 0.473, P = .03) are the categories significantly influencing workload. The remaining sociodemographic factors with a P value of >.05 do not significantly influence the respondents' workloads.

The effects of the sociodemographic characteristics of the respondents on the 6 components of the workload index and general health assessment were analyzed using 1-way analysis of variance (ANOVA) and independent sample t test, as the case may be, and presented in the subsequent tables. The differences in the task load scores of the 6 components of the TLX according to the demographic variables were analyzed and presented in Table 4. The ANOVA statistics were presented for age, marital status, and position in the office, while independent samples t test results were presented for gender, further academic studies, and increase in work pressure. The P values for age indicated significant differences (P < .05) in mental demand, physical demand, temporal demand, effort, and frustration across the different age groups of the respondents. The mental, physical, and temporal demands of the respondents, as well as effort and frustration, differ by age group. The Student–Newman–Keuls multiple comparison tests identified that the mental demand, physical demand, temporal demand, effort, and frustration for 18 to 25 years' age range, with the least mean task load score for each component, are significantly different from those of the other age ranges. As could be observed from the table, the mean scores for the higher age clusters are larger and closer to each other than the mean score for the significantly different age group. These imply that the older staff experienced higher mental demand, physical demand, temporal demand, effort, and frustration in their workloads after the COVID-19 lockdown. However, there performances are the same. Safari et al[46] achieved similar results in their evaluation of personnel health and mental workload among textiles workers and established

that the older workers are more vulnerable to mental workload than the younger workers who tend to be more resilient to high mental demand, physical demand, temporal demand, effort, and frustration. Bratberg et al[47] established that reduction in workload for aged males in their workplaces resulted to significant improvement in mental health and reduced sickness.

There is significant difference in the mean mental workload and frustration between the male and female administrative staff, where the female staff have higher mean scores than the male counterparts. These indicate that the female staff experienced higher mental workload and frustration than the males, though their physical demand, temporal demand, performance, and effort are the same. Also, the marital status of the respondents revealed that there are significant differences in the mean mental demand, physical demand, effort, and frustration. The Student–Newman–Keuls multiple comparison analysis revealed that the staff who are single are significantly different from the other staff of other marital status with the lowest mean score. This implies that the married, divorced, and widowed staff with high mean workload experienced significant mental and physical workload as well as significant effort and frustration, unlike the single administrative staff who displayed resilience. However, the temporal demand and performance workload of the respondents do not differ according to marital status though their mean temporal demands are very high. This indicates that the respondents suffered substantial temporal demand in the workplace since the COVID-19 lockdown was lifted and this is irrespective of their staff marital status. The widowed and the divorced experienced more physical demand than the married, while the single have the least physical demand, indicating their resilience to excessive physical workload in the workplace. In terms of the mean scores, the widowed suffered more frustration than the divorced and the married.

With a P value that is <.05 level of significance (P < .05), there are significant differences in the mean physical demand, performance, effort, and frustration among the different office positions of the respondents. The Student–Newman–Keuls multiple comparison analysis shows that the physical demands of technical officer/system analysts and assistant/deputy directors

Table 4

TLX components and task load scores according to demographics variables.

Variable		Mental demand	Physical demand	Temporal demand	Performance	Effort	Frustration
Age (yr)	18–25	39.0 ± 10.2	44.5 ± 17.7	47.5 ± 12.1	59.0 ± 16.5	45.0 ± 17.8	25.00
	26–35	60.3 ± 17.3	60.3 ± 12.8	58.9 ± 18.7	56.7 ± 13.2	52.8 ± 15.2	30.00
	36–45	60.7 ± 15.8	61.5 ± 16.8	69.4 ± 15.2	59.1 ± 12.2	58.5 ± 16.1	30.00
	Above 45	66.6 ± 14.1	64.6 ± 15.3	71.4 ± 11.3	60.2 ± 12.2	61.6 ± 17.1	45.00
	P value	.00**	.01**	.00**	.86	.04**	.00**
Gender	Male	55.0 ± 18.5	58.2 ± 18.8	62.4 ± 18.6	59.4 ± 15.9	53.3 ± 15.9	60.6 ± 21.0
	Female	63.0 ± 15.1	61.1 ± 17.9	66.0 ± 15.0	58.4 ± 9.90	58.5 ± 16.9	72.0 ± 17.1
	P value	.04*	.45	.37	.74	.20	.013*
Marital status	Married	64.7 ± 16.4	61.7 ± 15.1	64.7 ± 17.1	59.8 ± 12.4	62.3 ± 17.1	71.7 ± 18.6
	Single	49.8 ± 16.7	51.0 ± 16.6	60.0 ± 16.4	59.0 ± 14.4	45.3 ± 13.8	52.8 ± 19.1
	Divorced	53.3 ± 2.89	68.3 ± 20.2	70.0 ± 17.3	43.3 ± 2.89	48.3 ± 5.77	73.3 ± 5.77
	Widowed	55.0 ± 15.4	76.0 ± 8.94	77.0 ± 10.4	61.0 ± 11.4	53.0 ± 5.70	76.0 ± 8.94
	P value	.009**	.006**	.21	.19	.001**	.002**
Position	Clerical staff	67.0 ± 17.2	69.0 ± 8.22	75.0 ± 8.66	62.0 ± 10.3	54.0 ± 18.5	80.0 ± 7.07
	Technical officer	49.4 ± 21.3	48.8 ± 14.1	58.8 ± 18.9	45.0 ± 5.35	36.9 ± 114.4	58.1 ± 19.5
	Higher/Chief Exec. Officer	65.4 ± 15.8	64.7 ± 15.6	66.8 ± 16.2	62.4 ± 12.1	60.4 ± 16.7	70.5 ± 17.6
	Assistant/Deputy Director	53.1 ± 14.9	49.2 ± 17.8	57.7 ± 17.8	58.5 ± 15.9	56.5 ± 14.6	51.5 ± 25.6
	Director	57.0 ± 17.7	59.5 ± 13.4	63.5 ± 16.3	55.5 ± 9.85	56.5 ± 13.8	73.5 ± 7.47
	P value	.10	.006**	.22	.008**	.009**	.004**
Pressure	Yes	59.9 ± 17.0	60.1 ± 16.7	65.1 ± 16.4	59.4 ± 12.7	56.1 ± 17.2	68.0 ± 18.6
	No	40.0 ± 0.00	50.0 ± 0.00	40.0 ± 0.00	40.0 ± 0.00	60.0 ± 0.00	25.0 ± 0.00
	P value	.10	.40	.035*	.035*	.75	.002*

Results are presented as mean ± standard deviation.

TLX = Task Load Index.

*P < .05 is significant using independent samples t test at appropriate degrees of freedom.

**P < .05 is significant using 1-way analysis at appropriate degrees of freedom.

are significantly different from those of the directors, executive officers, and clerical officers. The mean physical demands for the technical officer/system analysts and assistant/deputy directors are smaller than those of the other positional categories, indicating that they experience less physical demands than the others. However, the clerical officers with the highest mean scores experienced the highest physical workload in the administrative system of the university. Similarly, the technical officer/system analyst has mean performance and effort significantly different from the others, and with the low mean scores experienced the low performance and effort workload in the administrative system. The most frustrated positions since the lifting of the lockdown are the executive officers, directors, and clerical officers, whose very high mean scores are significantly different from those of the technical officer/system analysts and assistant/deputy directors with lower mean frustration.

The results of the independent samples *t* test for increase in work pressure in the office since the lifting of the lockdown show that there are significant differences in the mean temporal demand, mean performance, and mean frustration between those under pressure and those that are not experiencing pressure. The mean temporal workload, performance, and frustration for those experiencing pressure in the office are substantially higher than those who did not indicate increase in work pressure. However, despite indicating increase in work pressure, the mental demand, physical demand, and effort of the respondents are not significantly different.

The general health assessment of the respondents based on their demographic characteristics is summarized in Table 5. The results show that the mean general health scores of the administrative staff differ significantly by age, gender, marital status, place of residence, years of service, further studies, and increased work pressure. The gender, work pressure, and further academic studies were analyzed with the independent samples *t* test, while the other variables were analyzed with the ANOVA. The multiple comparison analysis for the ANOVA results was by using the Student–Newman–Keuls test. The results revealed that the mean general health score for 18 to 35 years are smaller and significantly different from the mean general health of the staff who are above 35 years of age. This indicates that the older staff are more vulnerable to general health decline and associated health risks than the younger staff whose results indicate that they are less vulnerable and more resilient to general health decline due

to work-related psychological strains. The mean general health scores of the female respondents is significantly higher than those of the males, showing that the female respondents are exposed to more health-related risks than the male respondents at the workplace. This is also true for increased work pressure where the mean general health score of the respondents with increased work pressure after the lockdown are significantly higher than those not experiencing increase in work pressure. The general health of the respondents experiencing increase in work pressure is more vulnerable than those not experiencing work pressure after the lockdown.

The multiple comparison results for marital status show that the mean general health for the single and married staff is significantly different from those of the divorced and widowed at .05 level of significance. The mean general health scores for the divorced and widowed are significantly high, implying that they are more at health risk arising from the workplace since after the lockdown than the single and married counterparts. The Student–Newman–Keuls results for place of residence show that the mean general health score of the staff living in their family house is the lowest and significantly different from the others. These indicate that those living in the university quarters inside the campus, those in rented apartments, and those in their personal apartments have higher general health scores and are more prone to general health disorders.

The multiple comparison results for number of children show that the respondents with at most 2 children have mean general health score which is significantly different from the respondents with >2 children. The mean general health scores of those with no child or at most 2 children are lower than the mean general heath scores for those with 3 to 5 children or >5 children, indicating that having smaller number of children decreases health risk caused due to workplace stress, especially after the pandemic. Those with more number of children have higher mean scores and are more vulnerable to increased risk of general health problems. Also, the multiple comparison results for years of service identified the respondents with <5 years of service to have mean general health score which is significantly less than the mean scores for the staff with >5 years of service in the university system. The higher mean score of those with >5 years of service reveals that they are more at risk of health-related psychological disorder.

By adopting the categorization procedure by Sugarinda et al,[34] the task load scores were partitioned into 0 to 29 as "low

Table 5

GHQ Scores based on demographic variables.

Variable		Mean ± SD	P value	Variable		Mean ± SD	P value
Age (yr)	18–25	10.9 ± 1.20		Place of residence	Campus quarters	24.1 ± 2.29	
	26–35	18.1 ± 4.93	.00**		Rented	19.4 ± 5.69	.00**
	36–45	23.4 ± 2.48			Personal house	24.1 ± 0.69	
	>45	24.2 ± 2.33			Family house	10.3 ± 0.58	
Gender	Male	18.7 ± 6.08	.006*	Further studies	Yes	19.7 ± 5.99	.011*
	Female	22.2 ± 4.53			No	23.4 ± 2.41	
Marital status	Married	21.4 ± 3.84		Number of children	0–2	18.0 ± 6.04	
	Single	16.7 ± 6.91	.00**		3–5	23.7 ± 2.46	.00**
	Divorced	25.0 ± 3.46			>5	20.6 ± 5.53	
	Widowed	27.2 ± 1.64					
Position	Clerical staff	24.2 ± 1.10		Years of service	<5	14.1 ± 5.50	
	Technical officer	18.6 ± 7.73			5–10	20.0 ± 4.90	
	Higher/Chief Exec. Officer	21.5 ± 5.44	.07		11–20	23.3 ± 2.36	.00**
	Assistant/Deputy Director	17.5 ± 5.94			21–25	24.6 ± 2.21	
	Director	21.2 ± 1.87			>25	23.0 ± 2.65	
Work pressure	Yes	20.8 ± 5.45	0.047*				
	No	13.0 ± 0.00					

Results are presented as mean ± standard deviation.

GHQ = General Health Questionnaire, SD = standard deviation.

*$P < .05$ is significant using independent samples *t* test at appropriate degrees of freedom.

**$P < .05$ is significant using 1-way analysis of variance at appropriate degrees of freedom.

workload" and 30 to 100 as "high workload", to determine the workload of each of the respondents. Similarly, by adopting the categorization procedure by Dale et al,[43] the general health scores of the respondents were partitioned into 0 to 12 as "not at risk" and 13 to 30 as "at risk" (that is, more declined general health) to ascertain the general health of the respondents. Subsequently, the association between workplace task load and the general health of the respondents was ascertained using contingency coefficient. Contingency coefficient is a chi-square-based measure of association which not only examines the existence of association between categorical variables but also provides the strength of the association between the variables. The frequency distribution, the chi-square, and contingency coefficient results are summarized in Table 6. With the chi-square result having a *P* value of .00 (*P* < .05) at 1 degree of freedom, there is association between office workload and general health of the respondents. The general health of the respondents is significantly influenced by the office workload. From the value of the contingency coefficient (0.586), the influence of workload on the general health of the respondents is strong. This result is obvious in the contingency table as it could be observed that the 56 "at risk" respondents have high workload and the general health of none (0) of the respondents with low workload is at risk.

5. Discussion

The sociodemographic characteristics of the respondents, age, marital status, gender, number of children, caring responsibilities, number of years in service, position in the office, highest educational qualification, place of residence, engaged in further academic studies, increase in work pressure at the office due to the pandemic, and worried about being infected with COVID-19 by a colleague in the office, were used in understanding the impact of workload and general health. Age, gender, marital status, education, years in service, place of residence, further academic studies, and worry of being infected by colleagues at workplace significantly predict general health disorder among the administrative staff of the university. This implies that the general health of the respondents is significantly influenced by these sociodemographic factors. The findings of this study are in line with Mkumbo[45] who observed that people with lower academic qualifications are more prone to work-related stress than people with higher academic qualifications. Similar study conducted by Al Dhaheri et al[48] shows that age, gender, level of education, and region of residence of respondents have significant influence on the quality of life and mental health of the Middle East and North African region.

Only the number of years in service and increased work pressure in the workplace significantly predict the overall workload of the respondents obtained through the task load scores. The staff within the 18 to 25 years' age cluster have the lowest average workload, while those in higher age clusters have higher workload and the workload increases with increase in age. The

administrative staff who are 36 years and above have significantly high task load scores and are therefore more susceptible to mental, physical, and psychological breakdowns as well as frustration and stress.

The female administrative staff experienced higher mental workload and frustration and were on par with the male administrative staff on physical workload, temporal workload, performance, and effort. The married, divorced, and widowed respondents have significantly higher mental and physical workloads and also face more frustrations at workplace than the staff who were single. In a study among frontline nurses, it was also shown that marital status (married nurses) influenced the level of workload among the nurses.[49] The staff who were single have lower workload and are more resilient to mental, physical, and temporal demands and frustration at the workplace after the lockdown. The data showed that almost all the singles do not have children to take care of and are mostly younger in age (18–25 years), which could have aided their resilience. The workloads for all the different positions among the administrative staff are substantially high, but the clerical staff experience the highest physical demand and frustration. This could be a result of the enormous responsibilities of information documentation and dissemination within the university organogram through large quantities of memos and official documents which accumulated due to the lockdown. The technical staff have the lowest workload along with assistant/deputy directors and experienced less frustration in the workplace.

The older staff have higher general health scores and are at risk of health disorder. The younger staff in the 18 to 25 years age cluster are less at risk of general health disorder. However, in the field of nursing, a systematic review and meta-analysis has revealed younger age of nurses to be a major risk factor in increase in burnout among nurses,[50] which contrasts with the finding of this study. The most vulnerable to health disorder at the workplace are the females, divorced, widowed, those living in rented apartments, and those with >2 children. This finding corroborates the studies outcome by Rodriguez-Lopez et al[25] where female fashion retailing workers faced more emotional exhaustion than their male counterparts in Spain. This indicates that females are more at risk of COVID-19 pandemic-induced mental health disorder. Similar study has shown that gender and marital status of healthcare workers in Trinidad and Tobago are significant predictors of depression, stress, and anxiety.[51] The administrative staff who are single and those with no child or at most 2 children are more resilient to health disorder in the workplace.

In general, high workload is significantly associated with increase in general health disorder among the administrative staff of the university due to the COVID-19 pandemic. Similar finding was reported in a study involving frontline nurses exposed to excessive workload due to the pandemic and the higher risk of adverse mental health disorder due to the COVID-19 pandemic.[52] Esteban et al[53] also found in their study that workload significantly influences psychological distress and satisfaction with life among female Peruvian university professors who are also housewives. This implies that to mitigate mental health disorder, stress, burnout, and anxiety, efforts have to be channeled to moderating the impact of workload on employees for efficient output in the workplace.

6. Conclusions

Quantitative analysis was performed on the study data to better understand and appreciate the level of stress, anxiety, mental, physical, and psychological workloads as well as the level of frustration and overall health problems being experienced by the administrative staff of the university since the easing of the lockdown and reopening of the school. These are very vital in adopting measures and practices to forestall breakdowns, loss of lives, avoidable health crisis, underperformance, health burdens,

		General health		
		Not at risk	At risk	Total
Workload	Low	10	0	10
	High	7	56	63
	Total	17	56	73

Chi square = 38.17, df = 1, *P* value = .00.
Contingency coefficient = 0.586, *P* value = .00.
df = degree of freedom.

etc as well as the health, economic and social consequences. It was established in this study that high workload has significant negative effect on the general health and mental well-being of the administrative staff. Age was shown to impact the vulnerability of the respondents to health problems. The older employees are at higher risk of stress, burnout, anxiety, and overall health disorder due to workload than the younger administrative staff who are at lower risk of health disorder. The female employees are more at risk of mental exhaustion, anxiety, stress, and burnout due to workload at the workplace, which impacts their overall health and job performance.

In general, there is increase in stress, anxiety, burnout, and distress and decline in the general health, mental, and psychological well-being of the administrative staff/employees of the university post lockdown due to the COVID-19 pandemic. Therefore, the mental, psychological, and general well-being of the administrative staff of the University of Nigeria, Nsukka, at the workplace should be top priority in interventions targeting postpandemic renaissance of efficient job performance. The International Labour Organization[8] has recommended that the protection of the mental health of workers should be incorporated into the basic workplace occupational safety and health management systems. The International Labour Organization[8] document stipulated some measures to ensure the general health and safety of staff and these measures will be vital in safeguarding the mental, psychological, and health of the administrative staff of the university. There is need to assess the workload and work assignments to identify cases/situations of work overload and underload that may be affecting performance and productivity. Work assignments should be adjusted and redistributed among the administrative staff so that individuals receive appropriate responsibilities according to their individual capacities. These steps are important to avoid severe burnout syndrome, death, depression, and underperformance. A follow-up research is recommended to ascertain the overall impact of the COVID-19 on workload and general health of the entire staff of the university to forestall breakdown, especially as the COVID-19 variants continue to threaten the population.

Acknowledgments

Author contributions

Conceptualization: **Edith C. Edikpa, Baptista C. Chigbu, Amaka E. Onu, Bernadette N. Nwafor.**
Data curation: **Grace N. Anigbogu, Baptista C. Chigbu, Edith C. Edikpa, Honorius Chibuko, Mary C. Aneke, Chinwe F. Diara, Veronica N. Ogakwu, Esther B. Adepoju.**
Methodology: **Chidumebi N. Oguejiofor, Baptista C. Chigbu, Amaka E. Onu, Veronica N. Ogakwu, Bernadette N. Nwafor.**
Resources: **Chiawa I. Igbokwe, Esther B. Adepoju, Mary C. Aneke, Chidumebi N. Oguejiofor, Grace N. Anigbogu, Honorius Chibuko.**
Supervision: **Edith C. Edikpa, Baptista C. Chigbu, Veronica N. Ogakwu, Chinwe F. Diara.**
Validation: **Edith C. Edikpa, Bernadette N. Nwafor, Chidumebi N. Oguejiofor, Chiawa I. Igbokwe, Esther B. Adepoju.**
Writing – original draft: **Edith C. Edikpa, Baptista C. Chigbu, Amaka E. Onu, Chinwe F. Diara, Honorius Chibuko, Mary C. Aneke.**
Writing – review & editing: **Baptista C. Chigbu, Edith C. Edikpa, Amaka E. Onu, Veronica N. Ogakwu, Mary C. Aneke, Chiawa I. Igbokwe, Grace N. Anigbogu, Esther B. Adepoju.**

References

[1] Riou J, Hauser A, Counotte MJ, et al. Adjusted age-specific case fatality ratio during the COVID-19 epidemic in Hubei, China, January and February, 2020. medRxiv. Preprint posted online March 06, 2020. doi: 10.1101/2020.03.04.20031104.

[2] Jiang X, Zhao B, Cao J. Statistical analysis on COVID-19. Biomed J Sci Tech Res. 2020;26:19716–27.

[3] Douedi S, Miskoff J. Novel coronavirus 2019 (COVID-19) a case report and review of treatments. Medicine. 2020;99:e20207.

[4] Wolkewitz M, Puljak L. Methodological challenges of analysing COVID-19 data during the pandemic. BMC Med Res Methodol. 2020;20:1–4.

[5] Zuo M, Khosa SK, Ahmad Z, et al. Comparison of COVID-19 pandemic dynamics in Asian countries with statistical modeling. Comp Math Meth Med. 2020;2020:1–16.

[6] Al-Dhaeri AS, Bataineh MF, Mohamad MN, et al. Impact of COVID-19 on mental health and quality of life: is there any effect? A cross-sectional study of the MENA region. PLoS One. 2021;16:e0249107.

[7] Safety and Health Magazine. Job-related stress amid the Covid-19 pandemic. 2020. Available at: https://www.safetyandhealthmagazine.com/articles/20517-job-related-stress-amid-the-covid-19-pandemic. [Access date October 16, 2021].

[8] ILO. Managing Work-Related Psychosocial Risks During the COVID-19 Pandemic. Geneva: Internationa Labour Organization; 2020.

[9] Mäkiniemi J-P, Oksanen A, Mäkikangas A. Loneliness and well-being during the COVID-19 pandemic: the moderating roles of personal, social and organizational resources on perceived stress and exhaustion among Finnish University employees. Int J Environ Res Public Health. 2021;18:7146.

[10] Iboi E, Sharomi OO, Ngonghala C, et al. Mathematical modeling and analysis of COVID-19 pandemic in Nigeria. medRxiv. Preprint posted online July 31, 2020. doi:10.1101/2020.05.22.20110387.

[11] Chigbu BC, Edikpa EC, Onu EA, et al. Analysis and forecasting of confirmed, death, and recovered cases of COVID-19 infections in Nigeria: implications for university administrators. Medicine. 2021;100:e26776.

[12] Coe E, Cordina J, Enomoto K, et al. Returning to work: keys to a psychologically safer workplace. 2021. Available at: https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/returning-to-work-keys-to-a-psychologically-safer-workplace. [Access date October 20, 2021].

[13] Pamidimukkala A, Kermanshachi S. Impact of COVID-19 on field and office workforce in construction industry. Project Leadersh Soc. 2021;2:100018.

[14] Laker B. 94% of workers are stressed: KPMG research reveals COVID-19's effects on employees. 2021. Available at: https://www.forbes.com/sites/benjaminlaker/2021/05/04/the-future-world-of-work-is-fascinating-reveals-new-research-from-kpmg/?sh=e5d12006865c. [Access date October 16, 2021].

[15] Suka M, Yamauchi T, Yanagisawa H. Changes in health status, workload, and lifestyle after starting the COVID-19 pandemic: a web-based survey of Japanese men and women. Environ Health Preventative Med. 2021;26:37.

[16] Rostami F, Babaei-Pouya A, Teimori-Boghsani G, et al. Mental workload and job satisfaction in healthcare workers: the moderating role of job control. Front Public Health. 2021;9:683388.

[17] Saleem F, Malik MI, Qureshi SS. Work stress hampering employee performance during COVID-19: is safety culture needed? Front Psychol. 2021;12:655839.

[18] Deguchi Y, Iwasaki S, Niki A, et al. Relationships between occupational stress, change in work environment during the COVID-19 pandemic, and depressive and anxiety symptoms among non-healthcare workers in Japan: a cross-sectional study. Int J Environ Res Public Health. 2022;19:983.

[19] Ornek OK, Esin MN. Effects of a work-related stress model based mental health promotion program on job stress, stress reactions, and coping profiles of women workers: a control groups study. BMC Public Health. 2020;20:1658.

[20] Nguyen D, Teo S, Bentley T, et al. Enhancing Workplace Mental Health During and Post-Covid-19: Final report. Perth, Western Australia: Centre for Work + Wellbeing, School of Business and Law, Edith Cowan University; 2021.

[21] Jasiński AM, Derbis R, Walczak R. Workload, job satisfaction and occupational stress in polish midwives before and during the COVID-19 pandemic. Med Pr. 2021;72:623–32.

[22] Hayes SW, Priestley JL, Moore BA, et al. Perceived stress, work-related burnout, and working from home before and during COVID-19: an examination of workers in the United States. SAGE Open. 2021;1:12.

[23] Wu J, Li H, Geng Z, et al. Subtypes of nurses' mental workload and interaction patterns with fatigue and work engagement during coronavirus disease 2019 (COVID-19) outbreak: a latent class analysis. BMC Nurs. 2021;20:206.

[24] Yusefi AR, Nikmanesh P, Bordbar S, et al. Workload status and its relationship with job stress in nurses during the COVID-19 pandemic. Iran J Health Sci. 2021;9:1–11.

[25] Rodríguez-López AM, Rubio-Valdehita S, Díaz-Ramiro EM. Influence of the CoViD-19 pandemic on mental workload and burnout of fashion retailing workers in Spain. Int J Environ Res Public Health. 2021;18:983.

[26] Sinsky CA, Brown RL, Stillman MJ, et al. COVID-related stress and work intentions in a sample of US health care workers. Mayo Clin Proc Innov Qual Outcomes. 2021;5:1165–73.

[27] Plats K, Breckon J, Marshall E. Enforced home-working under lockdown and its impact on employee wellbeing: a cross-sectional study. BMC Public Health. 2022;22:199.

[28] Nikeghbal K, Kouhnavard B, Shabani A, et al. COVID-19 effects on the mental workload and quality of work life in Iranian nurses. Ann Glob Health. 2021;87:97, 1–10.

[29] Cook KS, Cheshire C, Rice ER, et al. Social exchange theory. Delamater J, Ward A, eds. In: Handbook of Social Psychology. New York, NY: Springer; 2013. 61–88.

[30] Neville AS, Salmon PM, Walker GH, et al. Human Factors Methods A Practical Guide for Engineering and Design. Hampshire, England: AshGate Publishing Limited; 2005.

[31] Shoja E, Aghamohammadi V, Bazyar H, et al. COVID-19 effects on the workload of Iranian healthcare workers. BMC Public Health. 2020;20:1636.

[32] Riono S, Bandono A. Analysis of mental workload with integrating NASA TLX and Fuzzy method. Int J ASRO 2018;1:37–45.

[33] Mohammadi M, Mazloumi A, Zeraati H. Designing questionnaire of assessing mental workload and determine its validity and reliability among ICUs nurses in one of the TUMS's hospitals. J Sch Public Health Inst Public Health Res. 2013;11:87–96.

[34] Sugarindra M, Suryoputro MR, Permana AI. Mental workload measurement in operator control room using NASA-TLX. IOP Conf Ser Mater Sci Eng. 2017;277:012022.

[35] Goldberg D. General Health Questionnaire (GHQ-30). Windsor: NFER-NELSON Publishing Company; 1978.

[36] Klainin-Yobas P, He H-G. Testing psychometric properties of the 30-item General Health Questionnaire. West J Nurs Res. 2014;36:117–34.

[37] Ohta Y, Kawasaki N, Araki K, et al. The factor structure of the General Health Questionnaire (GHQ-30) in Japanese middle-aged and elderly residents. Int J Social Psychiatry. 1995;41:268–75.

[38] Wancata J, Alexandrowicz R, Benda N. 30-item General Health Questionnaire in general hospitals: selecting items using a stepwise hierarchical procedure. Eur J Epidemiol. 2001;17:1001–4.

[39] Abdel-Rasoul GM, Mahrous OA, El Shazly HM, et al. Validity of the General Health Questionnaire as a screening tool for mental health disorders among secondary school students (Menoufia Governorate). Menoufia Med J. 2016;29:130.

[40] Yusoff MSB. The sensitivity, specificity and reliability of the Malay version 30-item General Health Questionnaire (GHQ-30) in detecting distressed medical students. Educ Med J. 2010;2:e12–21.

[41] Gao F, Luo N, Thumboo J, et al. Does the 12-item General Health Questionnaire contain multiple factors and do we need them? Health Qual Life Outcomes. 2004;2:63.

[42] Nagaraju B, Nandini HP. A factor of marital status highly influencing on stress of women employees: a case study at insurance sector. Int J Bus Manage Invent. 2013;2:39–49.

[43] Dale B, Sorderhamn U, Soderhamn O. Psychometric properties of the norwegian version of the General Health Questionnaire (GHQ-30) among older people living at home. Psychol Res Behav Manage. 2012;5:151–7.

[44] Osmanovic-Thunstrom A, Mossello E, Akerstedt T, et al. Do levels of perceived stress increase with increasing age after age 65? A population-based study. Age Aging. 2015;44:828–34.

[45] Mkumbo K. Prevalence of and factors associated with work stress in academia in Tanzania. Int J Higher Educ. 2014;3:1–11.

[46] Safari S, Akbari J, Kazemi M, et al. Personnel's health surveillance at work: effect of age, body mass index, and shift work on mental workload and work ability index. J Environ Public Health. 2013;2013:289498.

[47] Bratberg E, Holmas TH, Monstad K. Health effects of reduced workload for older employees. Health Econ. 2020;29:554–66.

[48] Al Dhaheri AS, Bataineh MF, Mohamad MN, et al. Impact of COVID-19 on mental health and quality of life: is there any effect? A cross-sectional study of the MENA region. PLoS One. 2021;16:e0249107.

[49] Zhang M, Zhang P, Liu Y, et al. Influence of perceived stress and workload on work engagement in front-line nurses during COVID-19 pandemic. J Clin Nurs. 2020;30:1584–95.

[50] Galanis P, Vraka I, Fragkuo D, et al. (2021). Nurses' burnout and associated risk factors during the COVID-19 pandemic: a systematic review and meta-analysis. J Adv Nurs. 3302;77:3286.

[51] Nayak BS, Sahu PK, Ramsaroop K, et al. Prevalence and factors associated with depression, anxiety and stress among healthcare workers of Trinidad and Tobago during COVID-19 pandemic: a cross-sectional study. BMJ Open. 2021;11:e044397.

[52] De Kock JH, Latham HA, Leslie SJ, et al. A rapid review of the impact of COVID-19 on the mental health of healthcare workers: implications for supporting psychological well-being. BMC Public Health. 2021;21:104.

[53] Esteban RFC, Mamani-Benito O, Chaparro JET, et al. Psychological distress and workload as predictors of satisfaction with life in Peruvian female university professors with a family burden. Heliyon. 2022;8:e08711.