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Stress Coping Strategies Amidst Preparation for Examinations: An Analytical Study among Undergraduate Medical Students

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Abstract

Background: Many rewarding life activities are associated with some stress, and academic activities are no exception. This study aimed to evaluate the sources of stress, stress-coping strategies adopted, hours of personal

study. And outcome of students examinations, among undergraduate medical students in a private medical university in the third quarter of year 2022.

Materials and Methods: A questionnaire-based cross-sectional analytical study was conducted in Port Harcourt, Nigeria at a private medical university using total population of students.

Results: A total of 237 students participated in this study, and91 (38%) were males while 146 (62%) were females. Seventy-three (30.8%) studied for 2 – 4hours, 66 (27.8%) did so for 4 – 6hours, and 68 (28.7%) studied for >6hours per day, one "week" to the date of examination. Sources of stress identified were academic, personal, social and family-related. A wide range of stress-coping strategies were adopted by the students; 50% of the respondents strongly agreed to engaging in religious-meditation / praying and playing or listening to music (both one week and a day to their examinations).Two hundred and nine (92.4%) respondents had an average score of 51% and above in their first and last examinations using their stress-coping strategies. Forty (16.8%) respondents scored >80% as average score in their first examination, and 46 (19.4%) in their last examination.

Conclusion: The identified sources of stress were numerous most of which were academic, personal, social and family-related issues, and a wide-range of stress-coping strategies were used. Religious meditation / praying and playing / listening to music were common stress-coping strategies adopted by more than 50% of the students both a week and a day to their examinations. Using their preferred stress-coping strategies, majority of the students had scores of 51-80% in their last examinations.

Keywords

Stress coping strategies; Medical students; Private university; Port harcourt; Nigeria.

Introduction

Many rewarding life activities are associated with some stress, and academic activities are no exception. When a drive to achieve set goals amidst daunting challenges of much academic work load within a regulated time frame is associated with threat of withdrawal following failure to beat pre-set pass mark as is often the case in medical education, it can possibly be referred to as "medicated stress". Fifty seven percent (57%) of medical students were found to be under psychological stress and 23% had clinical depression in a United States-based study [1]. The work load is known to be high and therefore could affect the overall performance of the students with known consequences, as reported in many other studies [2-7]. This is often associated with mental, physical, financial, psychologic, and social demands to beat the hurdles and achieve set goals in medical training. The impact of this academic stress was reported to be higher among female students in a study carried out in China, [8] although it was higher among males in another independent study, [9]and yet another found no statistical difference in the sexes [10]. Self-medication with drugs like caffeine, nicotine, etc., has been reported among these students [11].

Although stress has both positive and negative components, with the positive side (eustress) being capable of enabling body alarm to enhance performance and creativity, [12] most of the time, attention is often drawn to the negative side due to its capacity to cripple the sufferer. Individuals and institutions therefore evolve measures to tackle stress based on their paradigm and environment. In the academic environment, stress factors and coping strategies among students may vary. Financial and relationship problems were the two most common source of stress reported in a Malaysian study among medical students [13]. A study done in a private medical university in Nigeria, reported high perceived stress among first year medical students with females being more affected [14]. In another Nigerian medical school, about 95% of the students were known to have adopted some stress-coping strategies during the COVID-19 pandemic [15].

It is a known fact that medical students undergo special training in the university system. This is understandably due to their pass mark being fixed at fifty percent (relatively higher than the average university pass mark), relatively higher academic demands, longer duration of training, relatively higher financial burden, and the associated psychosocial implications. How do students cope amidst these challenges in our environment? What stress-coping strategies work for them? This study explored these issues and aimed at evaluating the sources of stress, stress-coping strategies adopted, hours of personal study, and outcome of students' examinations, among undergraduate medical students in a private medical university in the third quarter of year 2022.

Materials and Methods

Research Design

A cross-sectional analytical observational study.

Study Area

The study was conducted in Port Harcourt, the Capital City of Rivers State, Nigeria. Rivers State is a major crude-oil producing State like others in the Niger Delta region of Nigeria, housing many multinational crude-oil exploring, processing and marketing companies. The activities of these companies and the accompanying economic potentials attracts human traffic from within and outside the country.

Study Sites

The study site was at the PAMO University of Medical Sciences, a private medical university in Port Harcourt, Nigeria.

Study Population/Participants

Undergraduate medical students from the first year to the fifth year constituted the study population. This was a new private medical institution which only had students up to 500level at the time of the study.

Sample Size Determination

Total population of students who gave consent for the study was used.

Study Instrument

Semi-structured self-administered questionnaire was used for collection of data. The study instrument was partly adapted from pre-validated questionnaire used in a study by Mona Soliman [16].

Variables

Information on socio-demographics, average daily hours of preparations for examinations, sources of stress, stress-coping strategies, students' examination average score (outcome of students' examinations results) were collated.

Bias

Only students in a private university were used for this study. This is intended to allow conclusions to be drawn among students with similar experiences.

Validity/Reliability of Instrument

The study instrument was scrutinized by all authors and piloted in similar institutional environment and corrections made before commencement of study. The Cronbach alpha (in SPSS) was used for the validity of the study instrument. The Cronbach alpha was 0.995 showing that the collection of items was consistently measured with the same characteristics, and from the item statistics table (see appendix), the corrected item-total correlation for all the questions were above 0.900, and thus, no questions or items was deleted.

Data Analysis

Descriptive statistics was used in analyzing the research questions in this study. The 5-likert scale (a type of rating scale used to measure attitudes or opinions) was used. The decision rule for the 5-likert scale was based on the "criterion mean" score. Value of 3.00 and above was considered as benchmark for the "do not reject", while a mean score below 3.00 was "rejected". The Cronbach's alpha coefficient was used to measure the internal consistency or reliability of a set of survey items - to determine whether a collection of items consistently measures the same characteristics on a standardized 0 to 1 scale. "0" means no relationship or correlation, and "1" means perfect relationship or perfectly correlated, and the benchmark was "0.7". The data was analyzed using regression analysis (identifying the relationship between a dependent variable; source of stress and the independent variables; stress coping strategies "a week" and "a day" to the exam), and the outcome was used in taking decisions on the stress coping strategies. The Statistical Products and Services Solution (SPSS) version 21 and Microsoft excel were used in carrying out the analysis.

Results

Socio-demographic data of respondents shown in Table 1.

	Male	Fomalo	Total	Percentage						
	IVIAIC	remale	TOTAL	(%)						
Gender	91 (38%)	146 (- 62%)	237	100						
Age (in Years)										
14 – 19 Years	36	89	125	53						
20 – 24 Years	47	42	89	38						
25 – 29 Years	7	13	20	8						
30 – 34 Years	1	2	3	1						
Total	91	146	237	100						
	Mari	tal Status								
Single	87	139	226	95						
Married	4	3	7	3						
Complicated	0	2	2	1						
Separated	0	1	1	1						
	R	eligion								
Christianity	84	138	222	94						
Islamic	2	4	6	3						
Buddhist	0	1	1	0.4						
Atheist	1	1	2	0.8						
Grail Messenger	0	1	1	0.4						
Traditionalist	1	2	3	1.3						
	Level	in training								
100 Level	23	42	65	28						
200 Level	5	9	14	6						
300 Level	3	7	10	4						
400 Level	26	45	71	30						
500 Level	20	57	77	32						

Table 1 shows the socio-demographic characteristics of the students. A total of 237 students participated in this study. Ninety-one (38%) were males and 146 (62%) were female. One hundred and twenty-five (53%) respondents were within 14 - 19 years age groups, 89 (38%) were in the 20 - 24 years age bracket, 20 (8%) were within 25 - 29 years, and 3 (1%) were aged 30 - 34 years. Two hundred and twenty-six (95%) were single, and 222 (94%) were Christians. Respondents' level of training varied from 100 level (65 = 28%) to 500 level (77 = 32%).

How many hours per day do you usually put into personal studies (readings) a "week" to the date of											
	e	examination?									
	Male	Female	Total	Percentage (%)							
<2 hours per day	12	18	30	12.7							
2-4 hours per day	24	49	73	30.8							
4-6 hours per day	25	41	66	27.8							
>6 hours per day	30	38	68	28.7							
Total	91	146	237	100							
How many hours per day do you usually put into personal studies (readings) a "day" to the date of											
	(examination?	ſ	1							
	Male	Female	Total	Percentage (%)							
<2 hours per day	9	15	24	10.1							
2-4 hours per day	14	23	37	15.6							
4-6 hours per day	25	38	63	26.6							
>6 hours per day	43	70	113	47.7							
Total	91	146	237	100							
	Outcome of stu	ident's examinations r	esults								
What was your average sco	ore (result) of your firs stress	st examination using y sful environment?	our stress-coping st	rategies amidst the							
	Male	Female	Total								
< 50%	8	10	18 (7.6%)								
51 – 60%	22	36	58 (24.5%)								
61 – 70%	29	48	77 (32.5%)								
71 – 80%	17	27	44 (18.6%)								
>80%	>80% 15 25 40										
Total	91	146	237 (100%)								

What was your average score (result) of your last examination using your stress-coping strategies amidst the stressful environment?

	Male	Female	Total
< 50%	7	11	18 (7.6%)
51 - 60%	22	36	58 (24.5%)
61 - 70%	27	44	71 (29.9%)
71 - 80%	17	27	44 (18.6%)
>80%	18	28	46 (19.4%)
Total	91	146	237 (100%)

Table 2: Hours of personal study and Outcome of student's examinations results.

Table 2 shows respondents hours of personal studies. Thirty (12.7%) respondents studied for < 2hours/day a "week" to the date of examination, 73 (30.8%) studied for 2 – 4hours, 66 (27.8%) did so for 4 – 6hours, and 68 (28.7%) studied for >6hours per day a "week" to the date of examination. However, a "day" to the date of examination 24 (10.1%) had < 2hours/day of personal studies, 37 (15.6%) studied for 2 – 4hours, 63 (26.6%) studied for 4 – 6hours, and 113 (47.7%) respondents studied for >6hours. The female respondents devoted higher number of hours to personal studies than their male counterpart, a week and a day to examinations. Table 2 also shows the outcome of the students' examination results. Two hundred and nine (92.4%) respondents had average score of 51% and above in their first and last examination using their preferred stress-coping strategies. Forty (16.8%) respondents scored >80% as average score in their first examination, and 46 (19.4%) in their last examination.

					Strongl		
					У		
	Strongly		Sometime	Disagr	Disagre	Mea	Remark
Sources of Stress	Agree	Agree	s True	ee	е	n	S
							Do not
				32(14			Reject
Frequent Tests	79(33%)	47(20%)	72(30%)	%)	7(3%)	3.67	(DNR)
Lack of time to study the				20(8%			
material to be tested	114(48%)	62(26%)	38(16%))	3(1%)	4.11	DNR
				26(12			
Studying into the night	108(46%)	52(22%)	41(17%)	%)	10(4%)	3.94	DNR
				66(28			
Missing class	24(10%)	39(16%)	51(22%)	%)	57(24%)	2.61	Rejected
The number of materials				16(7%			
covered on test	125(53%)	58(24%)	33(14%))	5(2%)	4.19	DNR
Multiple tests at the				24(10			
same time	116(49%)	55(23%)	38(16%)	%)	4(2%)	4.07	DNR
Test subject matters go							
beyond what was				42(18			
covered in the classroom	72(30%)	43(18%)	63(27%)	%)	17(7%)	3.47	DNR
The number of details	85	71	63	11	7		
required by the teachers	(39%)	(30%)	(27%)	(5%)	(3%)	3.91	DNR
Dealing with new forms							
of assessment such the	68	80	56	17	16		
OSPE and PBL	(29%)	(34%)	(24%)	(7%)	(7%)	3.70	DNR
The large amount of							
extra-curricular activities	19	32	51	72	63		
carried out by Students	(8%)	(14%)	(22%)	(30%)	(27%)	2.45	Rejected
Daily activities unrelated							
to school (paying bills,	29	31	54	73	50		
cleaning house, etc.	(12%)	(13%)	(22%)	(31%)	(21%)	2.64	Rejected
Teachers' lack of time for	24	27	57	84	45	2.58	Rejected

students	(10%)	(11%)	(24%)	(35%)	(19%)		
Feelings of guilt because							
of giving more priority to							
personal life than to	43	46	81	44	23		
studies	(18%)	(19%)	(34%)	(14%)	(10%)	3.17	DNR
Heavy demand of	98	63	50	20	6		
students to study	(41%)	(27%)	(21%)	(8%)	(3%)	4.80	DNR
Concern about trying to	139	54	38	4	2		
learn all the content	(59%)	(23%)	(16%)	(2%)	(1%)	4.36	DNR
Difficulty in memorizing	106	73	39	16	3		
the contents presented	(45%)	(31%)	(16%)	(7%)	(1%)	3.97	DNR
Studying material that							
students consider							
unnecessary for their							
professional	85	63	52	27	10		
qualifications	(36%)	(27%)	(22%)	(11%)	(4%)	3.78	DNR
Competitiveness among	75	47	60	43	12		
students	(32%)	(20%)	(25%)	(18%)	(5%)	3.55	DNR
Waking up very early to	96	52	44	39	6		
go to school	(41%)	(22%)	(19%)	(16%)	(3%)	3.81	DNR
				43(18			
Family problems	53(22%)	48(20%)	71(30%)	%)	22(9%)	3.28	DNR
				58(24			
Marriage and children	33(14%)	21(9%)	41(17%)	%)	84(35%)	2.41	Rejected
High parental				15(2%			
expectations	99(42%)	67(28%)	31(13%))	25(11%)	3.84	DNR
Relationship problems	53	47	54	47	36		
with students	(22%)	(20%)	(23%)	(20%)	(15%)	3.14	DNR
Relationship problems	46	39	39	60	53		
with lecturer	(19%)	(16%)	(16%)	(25%)	(22%)	2.85	Rejected

Table 3: Sources of stress among respondents.

The sources of stress among respondents are shown in Table 3. Some sources of stress met the criterion mean benchmark of 3.00, and they include: frequent tests, lack of time to study the material to be tested, studying into the night, the amount of materials covered on test, multiple tests at the same time, test subject matter goes beyond what was covered in the classroom, the number of details required by the teachers, dealing with new forms of assessment such the objective structured practical examination (OSPE) and project based learning (PBL), feeling of guilt because of giving more priority to personal life than to studies, heavy demand of students to study, concern about trying to learn all the content, studying material that students consider unnecessary for their professional qualifications, competitiveness among students, waking up very early to go to school, family problems, high parental expectations, and relationship problems with students. However, some others did not meet the criterion mean bench mark.

	Strongly		Sometime		Strongly		Remark
Coping strategies	Agree	Agree	s True	Disagree	Disagree	Mean	s
Identifying with							
models of physicians							Do not
who prioritize their	68	48	63	43	15		Reject
own quality of life	(29%)	(20%)	(27%)	(18%)	(6%)	3.47	(DNR)
Study the minimum							
needed to pass	71	64	54	46	2		
subjects	(30%)	(27%)	(23%)	(19%)	(1%)	3.66	DNR
Respect their own							
physical limits,							
avoiding spending							
many hours without	89	58	51	26	13		
sleeping	(38%)	(24%)	(22%)	(11%)	(5%)	3.78	DNR
Avoiding comparing							
grades with other	102	69	46	15	5		
students	(43%)	(29%)	(19%)	(6%)	(2%)	4.05	DNR
Going to the movies	44	29	59	49	56		Rejecte
on weekends	(19%)	(12%)	(25%)	(21%)	(24%)	2.81	d
		62					
Going for walks	67 (28%)	(26%)	58 (24%)	22 (9%)	28 (12%)	3.50	DNR
Getting together with	62	47	51	38	39		
families and friends	(26%)	(20%)	(22%)	(16%)	(16%)	3.24	DNR
		30					Rejecte
Cooking	21 (9%)	(13%)	34 (14%)	80 (34%)	72 (30%)	2.36	d
		49					
Eating well	90 (38%)	(20%)	33 (14%)	29 (12%)	36 (15%)	3.54	DNR
Skipping classes to							
perform other							
activities that gives	27	19	35	77	79		Rejecte
pleasure (sports, etc.)	(11%)	(8%)	(15%)	(32%)	(33%)	2.32	d
Reading of literary	55	37	69	39	37		
non-medical works	(23%)	(16%)	(29%)	(16%)	(16%)	3.14	DNR
Playing or listening to	119	49	43	12	15		
music	(50%)	(21%)	(18%)	(5%)	(6%)	4.05	DNR
Playing or watching							
football games on	56	34	57	54	38		
television	(24%)	(14%)	(24%)	(23%)	(16%)	3.09	DNR
		45					
Going out to dinner	52 (22%)	(19%)	35 (15%)	63 (27%)	42 (18%)	3.01	DNRd
Going to Academic	29	28	47	59	74		Rejecte
Guidance Office	(12%)	(12%)	(20%)	(25%)	(31%)	2.49	d
		23					Rejecte
Student Council	32 (13%)	(10%)	49 (21%)	57 (24%)	76 (32%)	2.49	d

		31					Rejecte
Student Rights	34 (14%)	(13%)	44 (19%)	58 (24%)	70 (30%)	2.58	d
Stay away from	63	37	50	36	51		
reading for some time	(27%)	(16%)	(21%)	(15%)	(22%)	3.11	DNR
		16					Rejecte
Sexual activities	39 (16%)	(7%)	30 (13%)	59 (25%)	93 (39%)	2.36	d
		64					
Humor	94 (40%)	(27%)	50 (21%)	17 (7%)	15(6%)	3.90	DNR
Religion-Meditation /	125	55	28	11	18		
Praying	(55%)	(23%)	(12%)	(5%)	(8%)	4.09	DNR
		16					Rejecte
Substance abuse	39 (16%)	(7%)	30 (13%)	54 (54%)	98 (4%)	2.34	d

Table 4: Stress Coping Strategies: "A Week" before the Examination.

Table 4 shows the respondents' coping strategies "a week" before the date of the examination. The percentage of each of the scales on the itemized coping strategies were as well shown. Some coping-strategies met the criterion mean benchmark of 3.00 and these include: identifying with models of physicians who prioritize their own quality of life; studying the minimum needed to pass subjects; respecting by their own physical limits, avoiding spending many hours without sleeping; avoiding comparing grades with other students; going for walks; getting together with families and friends; eating well; reading of literary non-medical works; playing or listening to music; playing or watching football games on television; going out to dinner; staying away from reading for some time; making humor; and practicing religious meditation / praying. Some others did not meet the criterion mean bench mark. However, the stress-coping strategies "a week" before the date of examination as itemized in Table 4 were "Accepted, Not Rejected", since the grand mean; 3.15 was greater than the criterion mean (3.00).

	Strongly		Sometimes		Strongly		
Coping Strategies	Agree	Agree	True	Disagree	Disagree	Mean	Remarks
Identifying with models							
of physicians who							Do not
prioritize their own	75	40	55	42	25		Reject
quality of life	(3%)	(17%)	(23%)	(18%)	(11%)	3.41	(DNR)
Study the minimum	85	71	37	35	9		Do not
needed to pass subjects	(36%)	(30%)	(16%)	(15%)	(4%)	3.79	Reject
Respect their own							
physical limits, avoiding							
spending many hours	78	50	57	31	21		
without sleeping	(33%)	(21%)	(24%)	(13%)	(9%)	3.56	DNR
Avoiding comparing							
grades with other	112	55	29	25	16		
students	(47%)	(23%)	(12%)	(11%)	(7%)	3.93	DNR
Going to the movies on	37	22	31	66	81		
weekends	(16%)	(9%)	(13%)	(28%)	(34%)	2.44	Rejected
	59	52	32	46	48		
Going for walks	(25%)	(22%)	(14%)	(19%)	(20%)	3.12	DNR

Getting together with	48	33	46	50	60		
families and friends	(14%)	(14%)	(19%)	(21%)	(25%)	2.83	Rejected
Cooking	33 (14%)	16 (7%)	38 (16%)	65 (27%)	85 (36%)	2.35	Rejected
		42					
Eating well	97 (41%)	(18%)	39 (16%)	23 (10%)	36 (15%)	3.54	DNR
Skipping classes to							
perform other activities							
that give pleasure	29	17	30	65	96		
(sports, etc.)	(12%)	(7%)	(13%)	(27%)	(41%)	2.23	Rejected
Reading of literary non-	43	24	51	49	70		
medical works	(18%)	(10%)	(22%)	(21%)	(30%)	2.74	Rejected
Playing or listening to	104	41					
music	(44%)	(17%)	49 (21%)	23 (10%)	20 (8%)	3.78	DNR
Playing or watching							
football games on	44	17	47	55	74		
television	(19%)	(7%)	(20%)	(23%)	(31%)	2.59	Rejected
		30					
Going out to dinner	41 (17%)	(13%)	44 (19%)	66 (28%)	56 (24%)	2.72	Rejected
Going to Academic	31	19	39	60	88		
Guidance Office	(13%)	(8%)	(16%)	(25%)	(37%)	2.35	Rejected
		23					
Student Council	30 (13%)	(10%)	37 (16%)	60 (25%)	87 (37%)	2.36	Rejected
Student Rights	33 (14%)	20 (8%)	32 (14%)	80 (34%)	72 (30%)	2.41	Rejected
Stay away from reading	39	30	38	58	72		
for some time	(16%)	(13%)	(16%)	(24%)	(30%)	2.61	Rejected
					105		
Sexual activities	27 (11%)	21 (9%)	38 (16%)	46 (19%)	(44%)	2.24	Rejected
		49					
Humor	75 (32%)	(21%)	51 (22%)	28 (12%)	34 (14%)	3.43	DNR
Religion-	138	39					
Meditation/Praying	(58%)	(16%)	26 (11%)	14 (6%)	20 (8%)	4.10	DNR
					154		
Substance abuse	17 (7%)	12 (5%)	22 (9%)	32 (14%)	(65%)	1.75	Rejected

Table 5: Stress coping strategies: "A Day" before the examination.

Table 5 shows respondents' coping strategies and percentage of each of the scales on the itemized coping strategies "a day" before the date of the examination. Those that met the criterion mean benchmark of 3.00 were: identifying with models of physicians who prioritize their own quality of life; studying the minimum needed to pass subjects; respecting own physical limits, avoiding spending many hours without sleeping; avoiding comparing grades with other students; going for walks; eating well; playing or listening to music; humour; and religion / meditation / praying. At least 50% of the respondents strongly agreed to engaging in religious-meditation / praying and playing or listening to music (both a week and a day to their examinations). Others could not meet the criterion mean bench mark, as the grand mean was 2.92 was less than the criterion mean (3.00).

Model	R	R Squ	are	Adjusted R Square Std. Error of the Estim		e Estimate			
1	.955ª	.91	2		.911	_		.3989	
Mod	el	Sum of S	quares	Df	Mea	n Square	F-rati	o p	-value.
1 Re	gression	384.0	009	2	19	92.005	1206.4	92	.000 ^b
R	esidual	37.2	39	234	4.159				
	Total 421.249		249	236					
Estimated r	model coef	ficients a	nd statis	tical signifi	cance	e of the stre	ss-copir	ng strategies.	
	Unstandardized Coefficients		d	Standardiz Coefficier	zed nts		p-	95.0% Confid for	ence Interval · B
Model	E	3	Std. Error	Beta		t	valu e	Lower Bound	Upper Bound
1 (Constant)	0.	904	0.06 2			14.542	0.00 0	0.782	1.027
Stress coping strategies a week before the date of exam.	0.	515	0.05 8	0.572		8.879	0.00 0	0.401	0.629
Stress coping strategies a day before the date of exam	0.	345	0.05 6	0.393		6.105	0.00 0	0.234	0.456

 Table 6: Model Summary - Sources of stress / Regression analysis/statistical significance for stress-coping strategies.

Table 6 shows the relationship between sources of stress and the stress-coping strategies; and the statistical significance Table (ANOVA). The first model summary that provides the *R*, R^2 , adjusted R^2 , and the standard error of estimate, which can be used to determine how well a regression model, fits the data. The "*R*" column is the multiple correlation coefficient, with 0.955, which indicates a good level of prediction. The "*R*²" column is the coefficient of determination which is the proportion of variance in the source of stress that can be explained by the stress-coping strategies "a week" and "a day" before the date of examination which is 0.912, meaning that the stress-coping strategies explain 91.2% of the variability of the source of stress. The F-ratio above tests whether the overall regression model is a good fit for the data. The table shows that stress-coping strategies statistically significantly predict the source of stress, *F* (2,234) = 1206.492, *p* = 0.000, which is < 0.0005, which implies that the regression model is a

good fit of the data.

Table 6 also shows the general form of the equation to predict source of stress from stress-coping strategies "a week" before the date of examination, and stress-coping strategies "a day" before the date of examination is: predicted source of stress = 0.904 + 0.515 (stress coping strategies a week before the date of exam) +0.345 (stress coping strategies a day before the date of exam). Also, the statistical significance of each of the stress-coping strategies was tested, and this test whether the unstandardized (or standardized) coefficients are equal to 0 (zero) in the population. As can be seen from the "p-value" column that all stress-coping strategies coefficients are statistically significantly different from 0 (zero). A multiple regression analysis shows that these variables statistically significantly predicted source of stress, F(2,234) = 1206.492, p < 0.0005, $R^2 = 0.912$. The two variables added statistically significantly to the prediction, p < 0.05.

Discussion

"Real or interpreted threat to the physiological or psychological integrity of an individual that results in physiological and behavioral responses" defines stress [17]. The stress-coping strategies therefore are acts of responses to external stimuli, which is a known characteristic of every living thing. The form of response to stress is known to be determined by genetic and environmental influences, [18] and the students in this study are no exception. Out of the 237 respondents in this study, 62% were females suggesting almost twice female enrolment in this private medical university. Our finding is different from observations in other studies that highlighted limited female enrolment in Nigerian Universities [19-20]. However, these studies were carried out about 18 years ago. The trend is therefore changing as social or cultural factors are known to influence this occurrence [21]. The likely explanation for the high female enrolment in our study could be the trust the parents and guardians of the students had in the institution in grooming their female students in the relatively regimented environment of a private medical university. The location of the university in a Christian-dominate southern Nigeria State could explain why 94% of respondents were Christians. Majority of respondents were within 14 - 24 years age group. This is typical of most Nigeria universities.

A week before set examination date students studied for varied number of hours per day, and more than 50% of them invested a minimum of two hours and maximum of 6hours (or more) per day. In another study carried out among students in federal universities in Nigeria, 50% of student read for two to four hours per day [22]. In this study a few students (28.7%) had more than 6 hours of personal study per day, and the number of hours of study generally increased a day to the examination for the majority. In a study trying to understand what makes a good study day among undergraduate students, daily study satisfaction was observed to be directly related to time invested in studying [23]. Daily study satisfaction will therefore be associated with a feeling of guilt (a source of stress) for not doing enough as expected.

It is interesting to note that the females spent more time per day in personal studies than the males in this private university. It is not surprising that there were more females in the study with higher scores in their first and last examinations. Our findings differ from a Dutch study where female students were noted not to have performed as well as their male counter parts in Science, Technology, Engineering, and Mathematics (STEM) programs [24]. However, in Ethiopia, an increasing female participation in academics was noted with lower graduation rate, for which university-related factors and socio-cultural factors were implicated [25]. In another study, also in Ethiopia, the determinants were reported to be personal and university factors [26]. Our study findings differ from a study done among accounting students where no significant difference was observed in the performance of male and female students in Nigeria, [27] and among medical students in Pakinstan [28]. An Ibadan-based Nigerian study reported higher academic achievement in favour of males [29]. However, our study shares some similarity with the study in Saudi Arabia where gender differences in study time and performance outcomes were observed [30].

Numerous sources of stress among respondents were rated and some met the mean benchmark of 3.00, while others did not. All the students (100%) adopted one form of stress-coping strategy or the other. Some stress-coping strategies were used a week to examination (also a day to examination) by students and some of these included identifying with models of physicians who prioritized their own quality of life; studying the minimum needed to pass subjects; respecting own physical limits, avoiding spending many hours without sleeping; avoiding comparing grades with other students; going for walks; getting together with families and friends; eating well; reading of literary non-medical works; playing or listening to music; playing or watching football games on television; going out to dinner; staying away from reading for some time; making humor; and practicing religious meditation/praying. Interestingly, at least 50% of the respondents strongly agreed to engaging in religious-meditation/praying and playing or listening to music (both a week and a day to their examinations). These findings are similar to those of Johari and Hassan on stress and coping strategies among medical students in national university in Malaysia where such self-distracting or stress-coping mechanisms were reported among the students [13]. In a Saudi Arabian study, planning and time management were additional stress-coping strategies reported among medical students, although others viewed them as additional stressors [31].

Amidst the stressful environment, 92.4% of respondents had \geq 51% average score in their examinations. The outcome of the study revealed that the stress-coping strategies explained 91.2% of the variability of the source of stress. This implies some degree of resilience among the students. Resilience has been emphasized as a useful and interesting construct in medical education and research [32]. Another researcher expressed this phenomenon as mental toughness which varies with situation and time and with crucial role in performance, goal progress, and thriving under stress [33]. A writer in a study among university students in Mexico reported a distinction between hindrance stressors which diminish appraisals of life satisfaction, and challenge stressors which promote life satisfaction [34]. Medical training is one of the toughest programs in the University, and resilience, mental toughness and physical fitness are important and necessary attributes for every medical student to acquire in order to get through the training and graduate.

Limitations

This study is questionnaire-based, and the findings were self-reported. The study is therefore subject to the demerits of such studies in its category. The examination result scores quoted were not actual

scores, but average estimations in the opinion of the respondents.

Conclusion

The identified sources of stress were numerous most of which others academic, personal, social and family issues. A wide range stress-coping strategy were adopted by the students. At least 50% of the respondents strongly agreed to engaging in religious-meditation / praying and playing or listening to music (both a week and a day to their examinations). Thirty percent or more strongly agreed to studying the minimum that was needed to pass subjects; respecting their own physical limits, avoiding spending many hours without sleeping; avoiding comparing grades with other students; and eating well. Using their preferred stress-coping strategies, at least 16% of the respondents had scores of 80% and above in their examinations, while 75% had scores of 51-80% in their last examinations. Stress-coping strategies are therefore individual-based.

Recommendations

Administrators and counsellors/mentors of students should identify which stressors are hindrance stressors and challenge stressors to properly direct counselling of the students. The stress-coping strategies adopted by the students are helping them to undertake the programs in the university, and need minimal interference. Students who are not thriving should be identified for counselling services. Students should be encouraged to draw up their personal study schedule to avoid work overload and its attendant stressful consequences. The university should look in the direction of organizing stress management workshops to entrench in the new intake students on how to cope in the medical training.

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Ethical Considerations

The approval of the Research Ethics Committee of the PAMO University of Medical Sciences was obtained before commencement of the study.

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The study was self-funded by the researchers.

			AVERA	GE SCO	RES (RESULTS)		
	Hours of Personal Studies	FIRST EXAM (%)	Frequency	%	LAST EXAM (%)	Frequency	%
-	< 2hours	< 50	5	2%	< 50	5	2%
		51 - 60	13	5%	51 - 60	8	3%
		61 - 70	3	1%	61 - 70	1	0.40%
		71 - 80	4	2%	71 - 80	3	1%
		> 80	6	3%	> 80	10	4%
Þ		S.Total	31(13%)			27 (11%)	
VE	2 - 4hours	< 50	2	1%	< 50	7	3%
EK B		51 - 60	21	9%	51 - 60	19	8%
ÊFC		61 - 70	26	11%	61 - 70	18	8%
ORE		71 - 80	9	4%	71 - 80	15	6%
붊		> 80	13	5%	> 80	14	6%
DA		S. Total	71 (30%)			73 (31%)	
TEO	4 - 6hours	< 50	3	1%	< 50	5	2%
OF E		51 - 60	18	8%	51 - 60	16	7%
XAN		61 - 70	22	9%	61 - 70	23	10%
NIN/		71 - 80	12	5%	71 - 80	9	4%
		> 80	12	5%	> 80	14	6%
ž.		S.Total	67 (28%)			67 (28%)	
	> 6hours	< 50	3	1%	< 50	4	2%
		51 - 60	6	3%	51 - 60	10	4%
		61 - 70	32	14%	61 - 70	32	14%
		71 - 80	20	8%	71 - 80	18	8%
		> 80	7	3%	> 80	6	3%
		S.Total	68 (29 %)			70 (30%)	
		Grand Total	237			237	
AC	< 2hours	< 50	3	1%	< 50	2	1%
ΔΥ		51 - 60	7	3%	51 - 60	8	3%
BEF		61 - 70	3	1%	61 - 70	5	2%
ORE		71 - 80	4	2%	71 - 80	1	0.40%
Ŧ		> 80	4	2%	> 80	5	2%
E D		S.Total	21(9%)			21(9%)	
TE	2 - 4hours	< 50	0	0%	< 50	1	0.40%
OFE		51 - 60	16	7%	51 - 60	15	6%
EXA		61 - 70	10	4%	61 - 70	10	4%
MIN		71 - 80	8	3%	71 - 80	8	3%
IATI		> 80	7	3%	> 80	7	3%
N N		S.Total	41 (17%)			41 (17%)	

4 - 6hours	< 50	5	2%	< 50	7	3%
	51 - 60	19	8%	51 - 60	15	6%
	61 - 70	19	8%	61 - 70	16	7%
	71 - 80	8	3%	71 - 80	7	3%
	> 80	14	6%	> 80	19	8%
	S.Total	65 (27%)			64 (27%)	
> 6hours	< 50	6	3%	< 50	9	4%
	51 - 60	21	9%	51 - 60	20	8%
	61 - 70	43	18%	61 - 70	44	19%
	71 - 80	27	11%	71 - 80	25	11%
	> 80	13	5%	> 80	13	5%
	S.Total	110 (46%)			111 (47%)	
	Grand Total	237			237	

APENDIX 1: Study hours versus average scores.

	STRONGLY AGREE		AGREE			
Sources of Stress	Male	Female	Total	Male	Female	Total
	30	49	79	18	29	47
Frequent Test	(13%)	(21%)	(33%)	(8%)	(12%)	(20%)
Lack of time to study the material	43	71	114	24	38	62
to be tested	(18%)	(30%)	(48%)	(10%)	(16%)	(26%)
	41	67	108	20	32	52
Studying into the night	(17%)	(28%)	(46%)	(8%)	(14%)	(22%)
	9	15	24	15	24	39
Missing class	(4%)	(6%)	(10%)	(6%)	(10%)	(16%)
The amount of materials covered	48	77	125	22	36	58
on test	(20%)	(33%)	(53%)	(9%)	(15%)	(24%)
	44	72	116	21	34	55
Multiple tests at the same time	(19%)	(30%)	(49%)	(9%)	(14%)	(23%)
Test subject matters goes beyond	27	45	72	16	27	43
what was covered in the	(11%)	(19%)	(30%)	(7%)	(11%)	(18%)
classroom	(11/0)	(1070)	(00/07	(170)	(11/0)	(10/0)
The number of details required	32	53	85	24	47	71
by the teachers	(14%)	(22%)	(36%)	(10%)	(20%)	(30%)
Dealing with new forms of	26	42	68	30	50	80
assessment such the OSPE and	(11%)	(18%)	(29%)	(13%)	(21%)	(34%)
PBL	(11/0)	(10/0)	(2070)	(10/0)	(22/0)	(0 170)
The large amount of extra-	7	12	19	12	20	32
curricular activities carried out by	(3%)	(5%)	(8%)	(5%)	(8%)	(14%)
Students	(378)	(376)	(0/0)	(376)	(0/0)	(11/0)
Daily activities unrelated to	11	18	29	12	19	31
school (paying bills, cleaning	(5%)	(7%)	(12%)	(5%)	(8%)	(13%)
house, etc	(0,0)	(,,,,,,	(12/0)	(3/0)	(0/0)	(13/0)

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Teachers' lack of time for	9	15	24	10	17	27
students	(4%)	(6%)	(10%)	(4%)	(7%)	(11%)
Feelings of guilt because of giving more priority to personal life than to studies	16 (7%)	27 (11%)	43 (18%)	17 (7%)	29 (12%)	46 (19%)
Heavy demand of students to	37	61	98	24	39	63
study	(15%)	(26%)	(41%)	(10%)	(16%)	(27%)
Concern about trying to learn all	53	86	139	21	33	54
the content	(22%)	(36%)	(59%)	(9%)	(14%)	(23%)
Difficulty in memorizing the	40	66	106	28	45	73
contents presented	(17%)	(28%)	(45%)	(12%)	(19%)	(31%)
Studying material that students consider unnecessary for their professional qualifications	32 (14%)	53 (22%)	85 (36%)	24 (10%)	39 (16%)	63 (27%)
	29	46	75	23	24	47
Competitiveness among students	(12%)	(19%)	(32%)	(8%)	(10%)	(20%)
Waking up very early to go to	36	60	96	20	32	52
school	(15%)	(25%)	(41%)	(8%)	(14%)	(22%)
	20	33	53	18	30	48
Family problems	(8%)	(14%)	(22%)	(7%)	(13%)	(20%)
	13	20	33	8	13	21
Marriage and children	(5%)	(8%)	(14%)	(3%)	(5%)	(9%)
	38	61	99	25	42	67
High parental expectations	(16%)	(26%)	(42%)	(10%)	(18%)	(28%)
Relationship problems with	20	33	53	18	29	47
students	(8%)	(14%)	(22%)	(8%)	(12%)	(20%)
Relationship problems with	17	29	46	15	24	39
lecturer	(7%)	(12%)	(19%)	(6%)	(10%)	(16%)

Apendix 2: Category of students affected more by the sources of stress.

	EXAMINATION OUTCOMES (LAST EXAM) for "Strongly agree" and "Agree"					
Coping strategies a day before exam	< 50%	51-60%	61-70%	71-80%	>80%	Total
Identifying with models of physicians who prioritize their own quality of life	4 (2%)	25 (11%)	29 (12%)	22 (9%)	20 (8%)	Do Not Reject (DNR)
Study the minimum needed to pass subjects	13 (5%)	36 (15%)	37 (16%)	28 (12%)	34 (14%)	DNR
Respect their own physical limits, avoiding spending many hours without sleeping	3 (1%)	33 (14%)	39 (16%)	25 (11%)	25 (11%)	DNR
Avoiding comparing grades with other students	7 (3%)	39 (16%)	50 (21%)	32 (14%)	33 (14%)	DNR

	3	12	13	16	10	Pajacted	
Going to the movies on weekends	(1%)	(5%)	(5%)	(7%)	(4%)	Rejected	
	6	26	30	20	21	DNR	
Going for walks	(3%)	(11%)	(13%)	(8%)	(9%)	DNIX	
Getting together with families and	4	20	20	14	15	Rejected	
friends	(2%)	(8%)	(8%)	(6%)	(6%)	nejeeteu	
	3	11	10	11	10	Rejected	
Cooking	(1%)	(5%)	(4%)	(5%)	(4%)	nejeeteu	
	2	28	40	32	35	DNR	
Eating well	(1%)	(12%)	(17%)	(14%)	(15%)	Britt	
Skipping classes to perform other	2	11	6	10	8		
activities that gives pleasure	(1%)	(5%)	(3%)	(4%)	(3%)	Rejected	
(sports, etc)	(1/0)	(370)	(373)	(170)	(0/0)		
Reading of literary non-medical	6	20	13	15	8	Rejected	
works	(3%)	(8%)	(5%)	(6%)	(3%)	Rejected	
	8	40	43	30	27	DNR	
Playing or listening to music	(3%)	(17%)	(18%)	(13%)	(11%)	DINK	
Playing or watching football games	3	18	15	10	12	Peiected	
on television	(1%)	(8%)	(6%)	(4%)	(5%)	Rejected	
	4	13	20	18	13	Poincted	
Going out to dinner	(2%)	(5%)	(8%)	(8%)	(5%)	Rejected	
Going to Academic Guidance	2	9	15	10	9	Dejected	
Office	(1%)	(4%)	(6%)	(4%)	(4%)	Rejected	
	1	13	10	10	8	Deiested	
Student Council	(0%)	(5%)	(4%)	(4%)	(3%)	Rejected	
	1	18	11	8	11	Dejected	
Student Rights	(0%)	(8%)	(5%)	(3%)	(5%)	Rejected	
Stay away from reading for some	3	13	17	13	14	Paiastad	
time	(1%)	(5%)	(7%)	(5%)	(6%)	Rejected	
	3	11	8	7	9	Paiactad	
Sexual activities	(1%)	(5%)	(3%)	(3%)	(4%)	Rejected	
	9	30	44	27	17	DNR	
Humor	(4%)	(13%)	(19%)	(11%)	(7%)	DINK	
	8	48	54	33	37		
Religion-Meditation/Praying	(3%)	(20%)	(23%)	(14%)	(16%)	DINK	
	3	9	7	7	3	Poincted	
Substance abuse	(1%)	(4%)	(3%)	(3%)	(1%)	Nejetteu	

Apendix 3: Stress Coping Strategies: "A Day" Before The Examination And The Outcome Of The Last Examination For The Students That "Strongly Agree" And "Agree".

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