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Effect of Multiple Stress Management Intervention on Stress and Academic Performance of Automobile Technology Education Students in Universities in South-South, Nigeria

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Abstract: The study to determine the effect of multiple stress management intervention on stress, motivation and academic performance of university automobile technology education students in South-South, Nigeria. Two purposes with corresponding research questions and one hypothesis were generated, answered and tested, respectively. The study employed quasi-experimental design, the pretest, posttest non-equivalent control group design. The population for the study was 97 first year Automobile technology education students. The instruments used for data collection were validated by three experts and has overall reliability coefficients of 0.77. Data analysis was carried out using mean and standard deviation. MANCOVA was used to test the hypothesis. The findings revealed significant effect of the intervention on student's level of stress experience and academic performance. This implies effective reduction in students stress experience (viz: physiological, cognitive, emotional and behavioural responses to stress as well as improved academic performance. It was therefore recommended among others that multiple stress management intervention should be integrated in Automobile technology education and other engineering/technology based programmes to foster effective stress management practices among students. Also, there is the need for stress management training for all levels of automobile technology education students with involvement of capability within the university.

INTRODUCTION

Automobile is a self-propelled vehicle used for transportation of goods and passengers on the ground. Automobile technology education involves the application of scientific knowledge in the design, selection of materials, construction, operation, maintenance and pedagogical skills acquisition of automobiles[1].

Automobile technology is one of the trades offered in industrial technical education in the tertiary institutions. The programme of automobile technology in tertiary institutions including universities in South-South Nigeria is designed to produce competent technologists in various automobile trades despite the stressful nature of university education. Automobile technology education involves the application of scientific knowledge in the design, selection of materials, construction, operation, maintenance and pedagogical skills acquisition of automobiles[1, 2].

Automobile technology education is one of the professional course areas in the university. The course, in addition to the usual daily classroom lessons requires student's participation in the compulsory and highly technical workshop practice with varying automobile related practical sessions apart from higher academic requirements, greater time pressure, financial demands and lesser time for recreational activities in the university environment. University students including automobile technology education students need to adapt to various psychosocial changes besides motivation and coping with the academic and social demands in preparing for their professional careers[3]. Literature however, revealed that students with high stress level face various negative consequences of stress including sleeping problems[4], burnout[5], increased risk of depression and anxiety, suicide thoughts and anger[5, 6], risky health behaviours and poor dietary patterns[7]. This is an indication that stress would most likely have negative consequences among students of automobile technology education in the universities.

Automobile technology education students are not exempted from the stressful nature of life, especially those in the first year of their academic programme in the South-South Nigeria universities. The period of transition from secondary school to higher institution is a remarkable stage of human development[8]. During this stage, university students are considered to be in the last period of transition before adult life[9]. Their psychological and physical discomfort as a result of stress can manifest in various ways including mood, sleep, fear, depression and eating disorders[10]. In essence, this group of individuals is vulnerable to stressful events which affects their mental health, academic performance and can be detrimental to their progress[11]. Thus, students at this level require expert's assistance to be able to cope with and handle their stressful experiences. Compass *et al*.[12] asserted that a wide range of psychological interventions for the treatment and prevention of detrimental outcomes of stress should be designed to enhance the academic performance of automobile technology education students.

Stress is a holistic transaction between the Automobile Technology student and a stressor that results in the body's mobilization of a stress response. According to Lazarus *et al*.[13], stress is a particular relationship between a student and the environment that is appraised by the student as tasking or exceeding his or her resources and endangering his or her well-being. Chinaveh[14] indicated that large percentage of higher institution students are feeling overwhelmed, sad, hopeless and so depressed that they are unable to function". Students in Universities in South-South, Nigeria are among those experiencing such situation[15]. However, the level of stress experience by an individual student depends on the strength and persistence of the stress, individual's personality, cognitive appraisal of the stress and social support. Hence, students who are daily exposed to unavoidable stressors may experience high level of stress impact[16]. According to Karabay etc., stress is the adverse reaction students have in excessive academic pressure that causes feeling of fear, anxiety, terror, anger, annoyance, dread, irritation, sadness, discomfort, grief and depression. It implies that stressful experience among first year students is imminent which include those studying automobile technology education in universities. This is also because of their age and transition from secondary education to higher education.

Stress is reported to be associated with a variety of ailments and health outcomes which include depressive symptoms and poor general physical health[14, 17, 18]. Based on the foregoing, Hage and Al-Qaisy[6] advocated for effective and integrated theoretical models that could allow for the prevention of psychological difficulties (stress) among students. This is because stress can have an adverse effect on student's psychological and physical well-being with negative impact on student's academic performance[19].

Academic performance in the university is no doubt the measure of student's success. Academic performance points to the extent to which Automobile students have gained from a particular curriculum, subject or task based on relatively standardized experiences such as a class test. Effective learning and sound academic performance are said to constitute an integral part of the goal of schooling for students optimal performance. Student's academic performance however have high tendency to be drastically affected or influenced by academic stressors manifestation which include lack of concentration in the classroom, absence from lectures, examination tension, fear of failure and academic grading system, inability to complete multiple assignments among others[20, 21]. According to Nkem, vocational and technical subjects including automobile technology education students face the following, course stress, class work overload, shortage of course reference materials, unsatisfying learning experiences and assignment and project deadlines, lack of coverage of course contents

before examinations, lockers to keep belongings, delays/transportation to and from the school etc. In this study, academic performance means the total or overall output of individual automobile technology education student after assessment for participating in required academic activities at the end of the session. Automobile students need to be motivated in order to perform well.

However, most automobile technology education students in South-South, Nigeria lack stress management strategies with reason to the common experience of negative stress outcomes which indicate trial and error strategies because of lack of educative management intervention for handling stressful and related challenges. The requisite skill in stress management at present may be very low among automobile students which may have resulted into bad reactions to most of the stressors in university. According to Grant *et al*.[22] the ways in which university students (automobile students) cope with stress are potentially important mediators of the impact of stress on current and future mental health status as well as overall academic performance. This implies that automobile technology education students could acquire stress management skills through appropriate stress training intervention such as multiple stress management intervention.

Multiple Stress Management Intervention (MSMI) is a structured psycho-educational therapy in form of a training programme. The multiple stress management intervention approach is a face-to-face training which, according to Ebert *et al*.[16] is the most effective method of stress management therapy. It involve didactic teaching components as well as learning exercises with basic objective of ensuring that automobile students develop the capacity to effectively execute coping strategies and academic performance. Boujut *et al*.[8] confirmed that "despite reports of many symptoms including somatic (tiredness, headaches, backaches), psychological (e.g., depression, suicidal tendencies) and behavioural disorders (e.g., eating habits, addictive behaviours) among first year students, very few studies have focused on student's motivation, mental health and academic performance. Previous studies however reported that higher institution students perceive academic life as stressful, demanding report experience of emotional and cognitive reactions to stress, especially due to external pressures and self-imposed expectations[23].

Thus, automobile technology education students with provision of an educative assistance such as multiple stress management intervention on stress management would most likely use appropriate coping mechanism to prevent the gross negative consequences of stress[21, 24, 25]. Therefore, carrying out this intervention study could be a life time opportunity for students who participate in overcoming the defects of stress in their entire life. However, if automobile students are not exposed to stress management treatments especially at this early stage of their university life before adult life, stress may jeopardize their academic ambition, force them to adopt maladaptive behaviours, frustrate their mental health stability and make them one of the potential future frustrated automobile employees. Thus, it becomes imperative to examine the effect of multiple stress management intervention on level of stress and academic performance of first year automobile technology education students in universities in South-South, Nigeria.

Statement of the problem: The goal of automobile technology education in Nigerian universities is to produce automobile graduates or technologists with sound theoretical and practical knowledge who can test, diagnose, service and repair faults relating to automobiles. The automobile graduates have the prospect of either being employed or becoming self-employed achievement of this aim and objective requires adequate provision of learning facilities, stress free or less stress and always in a right state of mind to be able to cope with the demands of the courses. However, automobile technology education students in South-South, Nigeria universities are exposed to a large number of academic stressors with continued stressful experiences. As a result of these stressors, student cognitive effectiveness is affected with various negative behavioural display and reduced academic competencies and performance. For instance, there are frequent reports of high level of stress experience with symptoms and manifestations including signs of depression, felling overwhelmed, sad, hopeless, behavioural disorder, relational conflicts, anger, incessant sickness, mental declination, poor academic performance and suicide thought among students in universities in South-South, Nigeria which often leads to their inability to achieve their academic goals. Furthermore, a major concern is the inability of students most especially automobile technology education students in first year to manage these multiple academic demands, expectations and unavoidable stressors within university education which causes stressful experiences with detrimental effect ranging from mental health failure to poor academic performance. This problem if not addressed would continue to lead to graduation of half-baked, unskilled and irrelevant automobile technology education graduates from universities in South-South, Nigeria.

Moreso to prevent severe psychological effects and its implications among the automobile technology education students, effective stress management intervention is needed which could help or assist students in handling stressful university events appropriately, thereby avoiding its harmful effects which could affect or jeopardize student's academic performance and future

working ambitions. This stress management intervention should help automobile students with a better perception of the university environment and identify appropriate ways which will help to reduce the severe negative effect of stress among students. Therefore, the problem of this study is how to reduce stress and the negative manifestations that are noticeable among automobile technology education students in their study habit and other school activities in order to improve their academic performance.

Purpose of the study: The general purpose of this study is to determine the effect of multiple stress management intervention on stress and academic performance of automobile technology education students in universities in South-South, Nigeria. Specifically, the study determines:

- The effect of multiple stress management intervention on the level of stress experience among automobile technology education students
- The effect of multiple stress management intervention on academic performance of automobile technology education students

Research questions: The following research questions were answered in the study:

- What is the effect of multiple stress management intervention on the level of stress experience among automobile technology education students?
- What is the effect of multiple stress management intervention on academic performance of automobile technology education students?

Hypothesis: The following null hypothesis were tested at 0.05 level of significance:

- There is no significant effect of multiple stress management interventions on the level of stress experience among automobile technology education students.
- There is no significant effect of multiple stress management interventions on academic performance of automobile technology education students

MATERIALS AND METHODS

A quasi-experimental design was adopted for this study. Specifically, the pre-test, post-test, design was employed. The study was conducted in universities offering automobile technology education in South-South geo-political zone of Nigeria. The population for this study consists of 97 first year students of Automobile Technology Education in four universities offering the course as an option in the technical education programme in South-South zone of Nigeria. The first year automobile technology education students was used for this study because they are the most vulnerable to stress in the Universities. The entire population of the subject was used for the study because of the relative small size which is manageable and accessible by the researcher, hence, there was no sample. The instruments used for data collection in this study include; a questionnaire titled "Questionnaire on automobile technology student's stress experience and Mental Health Concern (QATSSEMMHC)" and an Automobile Technology Achievement Test (ATAT). The instruments used for collection of data in this study were validated by three experts from the University of Nigeria, Nsukka. In determining the reliability of the research instruments, the researcher administered 22 copies of the instruments to 22 first year students from University of Nigeria, Nsukka, Enugu, Enugu State, Nigeria. Statistical Package for Social Sciences (SPSS) Version 20.0 was used to analyze the data collected from the respondents. Cronbach alpha reliability coefficient index was used to determine the internal consistency of the instruments. The reliability coefficients obtained for the two segments of the questionnaire were 0.84 and 0.76. The overall reliability index for the instruments was 0.77. These indicated that the instruments were reliable. The data collected from the administration of both pre-test and post-test were analyzed and interpreted using Mean (X) and Standard Deviation (SD). The multivariate analysis of co-variance (MANCOVA) was used to test the hypothesis at 0.05 level of significant.

RESULTS

Research question 1: What is the effect of multiple stress management intervention on the level of stress experience of automobile technology education students?

The results presented in Table 1 above shows the mean difference between the pretest and posttest responses of students in the experimental and control groups on level of stress experience by Automobile Technology Education students in South-South Nigeria. The table shows that the pretest mean score (M = 20.88) and Standard Deviation (SD = 3.87) of automobile students in the experimental group is greater and higher than their posttest mean score (M = 12.88) and standard deviation (SD = 2.03) with a mean loss of -8.00 which shows decrease in level of stress experience by automobile technology education students in South-South Nigeria.

Also, Table 1 shows that the pretest mean score (M = 13.57) and Standard Deviation (SD = 1.81) of automobile technology education students in South-South Nigeria in the control group is less than their posttest

Table 1: Pretest/posttest mean scores of students on the effect of multiple stress management intervention on the level of stress experience among automobile technology education students

	Pretest			Posttest			
Groups	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean gain/loss	Remarks
Experimental	49	20.88	3.87	12.88	2.03	-8.00	Decrease
Control	448	13.57	1.81	14.86	1.06	1.29	Increases

Table 2: Pretest/posttest scores of students on the effect of multiple stress management intervention on academic performance of automobile technology education students

	Pretest			Posttest			
Groups	N	$\bar{x}$	SD	$\bar{x}$	SD	Mean gain/loss	Remarks
Experimental	49	53.57	4.39	58.14	4.18	4.57	Increases
Control	48	50.60	3.99	52.14	3.38	1.54	Increases

Table 3: Multivariate Analysis of Co-variance (MANCOVA) of the effect of multiple stress management interventions on academic performance of automobile technology education students

Academic performance		Sum of squares	df	Mean square	F	Sig.	Partial eta square	DEC
Achievement test	Contrast	4356.854	1	5356.856	683.332	002	0.941	S
	Error	788.578	99	6.745				
Practical performance	Contrast	17841.131	1	17841.131	1368.346	0.001	0.822	S
	error	1693.013	99	14.266				
Grouping (wilks' Lambda)	Hypothesized	-	2		766.572[b]	0.000	0.943	S
	error		121	-				

S = Significant, Df = Degree of Freedom, Dec = Decision

mean score (M = 14.86) with a mean gain of 1.29 which indicates increase in level of stress experience among automobile technology education students in south-South Nigeria. However, the mean decrease of -8.00 among the students in the experimental group shows that the multiple stress management intervention effectively influence the decrease in students stress experience. However, the mean increase of 1.29 among the students in the control group means that more stress was experienced in the absence of the stress management therapy.

Research question 2:

- What is the effect of multiple stress management intervention on the academic performance of automobile technology education students?

The results presented in Table 2 shows the mean difference between the pretest and posttest responses of students on the academic achievement in the experimental and control groups among automobile technology education students in South-South Nigeria. The Table shows that the pretest mean score (M = 53.57) and Standard Deviation (SD = 4.39) of automobile students in the experimental group increased to 58.14 at the posttest with a mean gain of 4.57. On the other hand, the pretest mean score (M = 50.60) and Standard Deviation (SD = 3.99) of the control group increased to 52.14 at the posttest with a mean gain of 1.54. However, the experimental group with mean gain of 4.57 has higher increase in their academic achievement than the control group with mean gain of 1.54 which implies that the multiple stress management intervention seems to effectively influence the marginal increase in the academic achievement of the automobile technology education students in South-South Nigeria in the experimental group compared to those students in the control group with no stress management experience or absence of any stress management therapy among automobile students.

Testing of hypothesis: There is no significant main effect of Multiple Stress Management Intervention (MSMI) on the academic performance of automobile technology education students.

The result in Table 3 shows the MANCOVA result of the effect of multiple stress management interventions on the academic performance of automobile technology education students. The result indicates that in achievement test an F-ratio of 683.332 with associated probability value of 0.002 was obtained while in practical test an F = 1368.346 with associated probability value of 0.001 was obtained and Wilks' Lambda combined effect of multiple stress management interventions on the academic performance of students shows an F = 766.572 with associated probability value of 0.000. Since, the associated probability values are less than 0.05 set as level of significance, the null hypothesis which states that there is no significant effect of multiple stress management interventions on the academic performance of automobile technology education students is rejected. Thus, the

inference drawn is that there is a significant effect in the mean achievement scores of students on the effect of multiple stress management interventions on the academic performance of automobile technology education students.

Findings of the study: The following findings emerged based on research questions answered and hypothesis tested in the study:

- The multiple stress management intervention effectively influences student's level of stress experience and academic performance
- Students in the intervention group performed better than their counterparts in the control group across level of stress experience and academic performance
- Multiple stress management intervention effectively aid reduction in the level of stress experience among students in the experimental group with corresponding increase in stress experience among students in the control group
- Established marginal increase in the academic performance of Automobile Technology Education students in the experimental groups.

DISCUSSION

The study found evidence of the effectiveness of multiple stress management intervention in influencing these stress and related variables among students. The study found that the multiple stress management intervention has significant positive influence on students level of stress which were maximally reduced as a result of the multiple stress management intervention. These findings corroborate the position by Chinaveh (2013) and Al-Qaisy (2011) who established that integrative theoretical models or effective stress intervention would aid prevention of psychological difficulties and detrimental outcomes and Heber *et al*. (2016) who agrees that a stress management intervention like the MSMI with a face-to-face training approach is the most effective method of stress management therapy.

There were established increase in the academic performance of automobile technology education students in the experimental groups. The effect of the MSMI enhances improvement of students. The finding is in line with Ongori, Awino and Agolla[20] and Bataineh[21] who stated that MSMI practically influence student's academic performance and improvement. It may be that this effective stress management technique produces better levels of adjustment to university life or help to motivate the students toward their academic studies which in turn, lead to better academic performance.

CONCLUSION

Based on the findings, this study concludes that multiple stress management intervention will be effective in training automobile students in stress management thereby limiting and reducing the detrimental effects of stress among students most especially those in the first year visa-vi, level of stress, mental health and their academic performance.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made: multiple stress management intervention should be integrated in automobile technology education and other engineering/technology based programmes to foster effective stress management practices among students.

There should be stress management training for all levels of automobile technology education students with involvement of professional therapists and educational stakeholders to improve students stress management capability within the university education. To promote effective stress management practices among students, general sensitization and specialized training programmes should be organized at least one semester in a session for both students and university staff towards effective stress management practices and application. Stress management centers with required facilities should be made available in the tertiary institutions for helping students who are victims of stressful circumstances.

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