

Stress Response: Do self-efficacy and exercise matter?

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ABSTRACT

Stress is rampant in the world today. Yet, studies investigating its impact on the student populations in the Nigerian context are scarce. Therefore, this study examined the impact of general self-efficacy and exercise on stress response among university undergraduate students. Participants were 202 students, aged 17 – 38 years. The University of Nigeria Stress Symptoms Scale (UNSSS) and the General Self-Efficacy Scale (GSES) were used to assess stress symptoms and self-efficacy, respectively. Hierarchical regression was used to analyze the data. It was found that both self-efficacy and exercise significantly and negatively impacted on stress response. Considering the buffering effect of self-efficacy and exercise on stress response, it is recommended that educational institutions articulate and execute programs that will empower students to better face the challenges of the ever changing and complex world.

Introduction

Being human entails facing challenges. From birth to childhood-adolescence-adulthood-old age, one encounters tasking situations that one has to face. The extent to which one deals with such situations and effectively solves presenting problems, is the extent that one develops as a balanced human being. Stress is a situation that tasks, or is perceived as tasking the individual's coping capacity. Many circumstances can be stressful for an individual. Dougall and Baum (2001) divided stressful events into two sub-types, namely acute and chronic stressors. Acute stressors are threatening events that have a relatively short duration and a clear end point, whereas chronic stressors are threatening events that have a relatively long duration and no readily apparent end limit. However, four major types of stress include frustration – this occurs when the pursuit of some goal is thwarted; conflict – when two or more incompatible motivations or behavioral impulses compete for expression; life-changes – any noticeable alterations in one's living circumstances that require readjustment; and pressure – expectations that a person behave in a certain way.

Even though in life stress is inevitable, the experience of perceiving some circumstances as stressful depends on how one appraises the event or circumstance (Monroe & Kelly, 1995). An event that is stressful for one person may not be so for another, and may even be pleasurable for another. Lazarus and Folkman (1984) distinguish between primary and secondary appraisal. Primary appraisal deals with whether an event appears threatening or harmless. If the event is perceived as threatening, then the secondary appraisal comes in; the person evaluates whether he/she has the resources to cope with the challenge. Stress occurs when one feels that one may have difficulty coping with the event. In view of the central role of stress in physical and mental health conditions, it becomes

necessary to search for factors that influence stress response with the hope that controlling such factors, one will indirectly control the impact of stress in people's lives. The focus in this study is on self-efficacy and exercise.

Self-efficacy is one's conviction that one can achieve specific goals. Bandura (1997) believes that self-efficacy is a crucial element of personality. One who has high self-efficacy is confident in executing actions necessary to achieve desired goals, whereas one who has low self-efficacy worries that one does not have what it takes to achieve the desired goal. Researches show that greater self-efficacy is associated with greater adherence to exercise regimen (Schwarzer & Fuchs, 1995), performance (Denovan & Macaskill, 2017; Loton & Waters, 2017; Pajares, 1996; Villada, Hidalgo, Almela, & Salvador, 2017), success in athletic competition (Kane et al., 1996), health habits and response to stress (Bandura, 1997; Denovan & Macaskill, 2017; Loton & Waters, 2017; Loton & Waters, 2017). Obi-Nwosu (2008) found that participants who have low self-efficacy report high trait anxiety; likewise, Onyeizugbo (2010) found that those who have low self-efficacy report higher test anxiety. Self-efficacy is also associated with psychological well being and coping with stress (Cabras & Mondo, 2018; Chang & Edwards, 2015; Freire, del Mar Ferradás, Núñez, Valle, & Vallejo, 2019; Freire, Ferradás, Valle, Núñez, & Vallejo, 2016; Lambert, Passmore, & Joshanloo, 2018; Lee & Kim, 2017; Luberto, Cotton, McLeish, Mingione, & O'Bryan, 2014; Luque, Yáñez, Tabernero, & Cuadrado, 2017; Villada, Hidalgo, Almela, & Salvador, 2017; WHO, 2019; Zhao, Lei, He, Gu, & Li, 2015).

According to Barlow, Rapee, and Reisner (2001), when confronted with threats and challenges, one's feelings range along a continuum from depression to anxiety to excitement, depending in part on one's sense of control and

ability to cope – with depression signifying lowest feeling of control and excitement highest feeling of control. It is self-efficacy that differs most markedly among these emotions, leading to different feelings (Taylor et al., 1997). It is therefore, the feeling of self-efficacy that may make a difference between one person considering a task stressful and another exciting.

Regular, moderate exercise - at least 30 minutes of continuous exercise that raises the heart rate to 70% to 85% of maximum capacity at least 4 times a week (Taylor, 1986), is associated with good health (Jenkins, 1988). Lee, Hsieh and Paffenbarger (1995) found that regular exercise is associated with increased longevity. Blair et al. (1989) studied death rates among men and women who exhibited low, medium, or high fitness. Both medium and high fitness were associated with lower mortality rates in both genders. The researchers noted that one could achieve this level of fitness (medium) by taking a brisk half-hour walk each day. Exercise is correlated with greater longevity because among other things, an appropriate exercise program can enhance cardiovascular fitness and thereby reduce one's susceptibility to cardiovascular problems (Lakka et al., 1994). Further, exercise may serve as a buffer that reduces the potentially damaging effects of stress and increase mental health (Mangerud, Bjerkeset, Lydersen, & Indredavik, 2014; Plante, Caputo, & Chizmar, 2000; van Alphen, Hortobágyi, & van Heuvelen, 2016; WHO, 2016; 2018; 2019). Other positive impacts of exercise include reduced depression (Machaczek et al., 2018; Phillips et al., 2001; Radovic, Melvin, & Gordon, 2018; Schuch et al., 2016; Vancampfort et al., 2017); improvements in mood, self-esteem, work efficiency, and reductions in tension and anxiety (Hays, 1999). Some of the sports and exercises rated highly in impacting on physical and general well being include: Jogging, bicycling, swimming, handball, basket ball, tennis, calisthenics, walking, among others (Conrad, 1976).

Many studies have been done linking self-efficacy to various psychological/behavioral outcomes (Bandura, 1997; Cabras & Mondo, 2018; Chang & Edwards, 2015; Freire, et al., 2019; Kane et al., 1996; Onyeizugbo, 2010; Pajares, 1996; and Schwarzer & Fuchs, 1995) but few studies have been done, especially in Nigeria, on the role of self-efficacy in stress response. Likewise, several studies have been done on the relationship of exercise on physical and psychological well-being (Blair et al., 1989; Lee, Hsieh, & Paffenbarger, 1995; Phillips et al., 2001; van Alphen et al., 2016; WHO, 2016, 2018, 2019) but its role in stress response has received very little attention, especially in Nigeria. The present study is aimed at filling this gap by contributing data on the roles of self-efficacy and exercise on stress response. It is expected that both self-efficacy and exercise will play significant roles in response to stress such that higher self-efficacy and more exercise will be associated with lower stress reactions in university students. This expectation is based on the findings in literature that high self-efficacy is associated with more positive appraisal of threat and confidence in one's coping ability. Equally, regular exercise is expected to make one physically and emotionally strong, hence, leading to resistance to stress.

Method

Participants

Two hundred and two (202) undergraduate students were sampled among students from universities across the Federal Republic of Nigeria. These comprised 120 (59.4%) men and 82 (40.6%) women, age range 17 to 38 years (Mage = 21.71; SD = 3.16). By marital status, 191 (94.6%) were single, whereas 11 (5.4%) were married. The students were drawn from various zones across the Federal Republic of Nigeria, thus: South-East = 43 (21.3%); South-South = 28 (13.9%); South-West = 31 (15.3%); North-Central = 50 (24.8%); North-East = 25 (12.4%); North-West = 25 (12.4%). Also, respondents were from diverse religious background, thus: Catholics = 89 (44.1%); Protestants = 44 (21.8); Pentecostals = 13 (6.4%); and Moslems = 56 (27.7%).

Instruments

A 2-page questionnaire was used to gather data. The first part contained the University of Nigeria Stress Symptoms Scale (UNSSS: Onyeizugbo, 2007), which is used to measure stress reactions. It has 50 items that assess physiological, psychological and behavioral aspects of stress response. The respondent is expected to indicate whether one has experienced, for instance, "Too much work", "Lack of concentration", etc. It is a 5-point scale - Never (1); Rarely (2) Sometimes (3) Often (4) Always (5). The higher the score, the more stress reactions. The scale was validated on adults aged 18 years and above. The internal consistency of the scale was established through item analysis, with Cronbach's α of .91. The construct validity of the instrument was established using factor analysis. The UNSSS has only one factor, suggesting that all the 50 items should be used to get a comprehensive view of a person's experience of stress. Immanuel (2018) reported an α of .93 in a study involving 210 undergraduate students, aged 15-29. According to Onyeizugbo (2007), the concurrent validity of the UNSSS was $r = .56$ and $.58$ when administered concurrently with the State-Trait Anxiety Inventory (STAI) forms Y-1 and Y-2 respectively (Spielberger, Gorsuch, & Lushene, 1970; Spielberger, 1972). Thus, the UNSSS has a robust psychometric property which increases one's confidence in using it as an instrument for the assessment of stress response.

The second part of the questionnaire contained the General Self-Efficacy Scale (GSES: Jerusalem & Schwarzer, 1992). It was developed to assess a general sense of perceived self-efficacy with the aim to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events. It contains 10 items and responses are made on a 4-point scale ranging from 1 (not at all true) to 4 (exactly true). Some of the items include: "I can always manage to solve difficult problems if I try hard enough"; "I am confident that I could deal efficiently with unexpected events"; etc. It is a unidimensional scale and the developers found the Cronbach α s in many nations to range from .76 to .90. Schwarzer et al. (1997) found a discriminant validity of -.52 and -.60 by correlating the GSES with a depression measure (Zerssen, 1976) and an anxiety measure (Spielberger, 1983), respectively.

Table 1: Regression Summary – Self-Efficacy and Exercise predicting Stress Response

Predictors	Step 1					Step 2				
	B	SE	β	t	95%CI	B	SE	β	t	95%CI
Self-Efficacy	-1.65	.17	-.57	-9.88*	-1.98, -1.32	-.98	.13	-.34	-7.44*	-1.24, -.72
Exercise										
R^2	.33					.65				
ΔR^2	.33					.64				
F	97.58(1, 200)*					181.65(1,199)*				

* $p < .001$; R^2 = R square; ΔR^2 = Adjusted R square; B = Unstandardized regression coefficient; β = Standardised regression coefficient; CI = Confidence Interval for B

The third part contained demographic data. In the demographic section, participants were asked to indicate their age, sex, marital status, ethnic group, and religion. The demographic sheet also contained an item that says "Do you exercise regularly?" Yes ___; No ___. Those who responded yes were further required to indicate how many hours a week they exercise. Those who exercised 2 hours and more in a week were considered regular exercisers and the rest were considered non exercisers. Exercise was defined as regular, moderate exercise (physical activities), at least 30 minutes duration, that raises the heart rate to 70% to 85% of maximum capacity at least 4 times a week (Taylor, 1986), such as aerobics, jogging, cycling, swimming, etc.

Procedure

Four research assistants were employed to distribute the questionnaire forms to participants. Participants were located in a university in Eastern Nigeria where students from various universities in the country gathered for national sports competition – Nigerian University Games (NUGA). Participants were approached during the opening ceremony of the competitions as both participants and non participants gathered for the event. Those who volunteered to participate in the study filled the forms. It took about 10 minutes to fill the forms. The respondents, after filling the forms, dropped the forms in a bag that each research assistant held. This was to ensure anonymity as the research assistants could not tell who filled which form. Two hundred and twenty-four copies of the forms were filled. However, 22 copies were missing in one or more demographic data, and so they were removed before analysis. Only 202 copies that were properly filled were scored and used for data analysis.

Design/Statistics

The study utilized survey method; and cross-sectional design was adopted in the study. Hierarchical (multiple) regression was used for data analysis with the aid of the Statistical Package for the Social Sciences (SPSS, 16.0).

Results

Results of the hierarchical multiple regression for the test of the hypotheses is shown in Table 1. Self-efficacy was added in the Step 1 of the regression analysis. It significantly and negatively predicted stress response, $\beta = -.57$, $t = -9.88$, $p < .0$

01. This is as expected – self-efficacy had a significant and negative relationship with stress response. The unstandardized regression coefficient (B) showed that for every one unit increase in self-efficacy, stress response decreases by 1.65 units. The contribution of self-efficacy in explaining the variance in stress response was 33% ($R^2 = .33$), and the model was significant, $F(1, 200) = 97.58$, $p < .001$.

In step 2, exercise was added in the regression model. It significantly and negatively predicted stress response, $\beta = -.61$, $t = -13.38$, $p < .001$. This is also as expected – exercise had a significant and negative relationship with stress response. The unstandardized regression coefficient (B) showed that for every one unit increase in exercise, stress response increases by 30.59 units. The contribution of exercise in explaining the variance in stress response was 65% ($R^2 = .65$), and the model was significant, $F(1, 199) = 181.65$, $p < .001$.

Discussion

This study examined the impact of self-efficacy and exercise on stress response. The findings indicated that self-efficacy had a significant negative association with stress reactions such that as self-efficacy scores of participants increased, their stress scores reduced, implying that higher self-efficacy was associated with lower stress reaction. This is in congruence with extant literature (Bandura 1997; Denovan & Macaskill, 2017; Loton & Waters, 2017; Loton & Waters, 2017) that self-efficacy enables one to withstand stress. The finding of this study is expected. The confirmation of findings made outside the African continent shows that regardless of environment, self-efficacy engenders an individual's positive response to stress. As some authors (Lazarus & Folkman, 1984; Monroe & Kelley, 1995) rightly observed, whether one considers a situation a threat or not depends on appraisal. Self-efficacy enables one who has acquired it to judge or appraise day-to-day challenges as obstacles one can easily surmount using personal skills, unlike one who has low self-esteem who underrates one's capabilities, and hence feels overwhelmed by stress in the environment. When one thinks positively about a situation, even if at times, it entails over estimating one's capabilities, it makes the person work harder to find solution to problems; and each time one is able to solve a challenging problem, it reinforces one to work harder, thereby strengthening one's self-efficacy and self-esteem. On the other hand, when one gives up easily, feeling incapable of handling minor challenges in the environment, the person, by not working harder to face the

task, fails and such failure, which is stressful, reinforces one's position of powerlessness.

This study also found that exercise impacts significantly and negatively on stress response, such that more exercising was associated with lower stress reactions. This is supported by research (e.g., Jenkins, 1988; Plante et al., 2000; van Alphen, et al., 2016; WHO, 2016, 2018, 2019). Exercise has been shown to facilitate physical (Lee et al., 1995; Lakka et al., 1994) and psychological well-being (Hays, 1999; Machaczek et al., 2018; Phillips et al., 2001; Radovic et al., 2018; Schuch et al., 2016; Vancampfort et al., 2017). The impact of exercise on stress symptoms is not surprising. As observed by Blair et al. (1989) persons who do not exercise regularly have lower longevity compared to those who exercise regularly even at moderate level. Exercise invigorates the body, and when the body is relaxed, the mind – intellect, brain – is also relaxed, and one can concentrate easily, think clearly, and generally enjoy life. These are characteristics that mark life changers, who embrace life with confidence, and walkover the stress of life, seeing it as a bridge to greatness.

It is instructive that both self-efficacy and exercise negatively predicted stress response. As students appreciate in self-efficacy, trusting more in their capability to take on life's challenges, and as they exercise their bodies regularly, they become more wholesome, and face life with stronger confidence, with concomitant psycho-physical well being. Research supports that the combined effects of self-efficacy and exercise on mental health is stronger than either self-efficacy or exercise alone (Guicciardi, Carta, Pau, & Cocco, 2019; Guicciardi et al., 2014; McAuley & Blissmer, 2000; Morris, McAuley, & Motl, 2008).

In this work, some older students (age 30 -38) were included in the sample. This may affect the results due to experience and other responsibilities. In future studies among undergraduate students, it is recommended that one samples more students of younger age, and less of older students. This study considered only self-efficacy and exercise as factors influencing stress response. It is expected that further studies in the area will examine other factors that are likely to influence stress reactions/symptoms, e.g., hardiness, coping capability, etc.

Given the buffering effect of self-efficacy and exercise on stress response, it is recommended that institutions of higher learning put up programs that encourage all students to participate in games, sports, and exercises regardless of discipline. Days are gone when sporting activities are left for only very few gifted individuals. Even though many people are engaged in sports and exercises to reduce weight or to keep fit, far more individuals are yet to rise to the exercise challenge. Tertiary education administrators should aim at having most of the students drilled in sports and physical exercises as a requirement for graduation. This will give rise to graduates who are strong in character, learning and physique, ready to impact positively on their worlds. Also, group psychotherapy programs could be organized for students to boost their self-efficacy. It will enable students to trust themselves as capable individuals who have power to change their worlds instead of

of giving in to stress and its destructive effects. These programs will save the hours and money lost on stress-related ill health conditions.

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