

European Journal of  
**Health Sciences**  
(EJHS)



**INFLUENCE OF GENDER AND RELIGION ON  
THE EXAMINATION STRESS OF  
SECONDARY SCHOOL STUDENTS IN SOUTH  
WESTERN NIGERIA**

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## INFLUENCE OF GENDER AND RELIGION ON THE EXAMINATION STRESS OF SECONDARY SCHOOL STUDENTS IN SOUTH WESTERN NIGERIA

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### ABSTRACT

**Background:** Stress can raise the blood pressure of a subject and a number of environmental factors can change that level of the stress, especially the examination stress. These factors which include gender and religion are referred to as modifiers of stress.

**Objective:** This study was therefore designed, using data of blood pressure, to understand the influence of religion and gender on the effect of examination stress on blood pressure of the secondary school students in South Western (SW) Nigeria.

**Methodology:** The population of the study comprises all the students of Oroke Grammar School, Akungba Akoko (650) out of which a sample of 351 that satisfied our criteria was selected, using purposive sampling technique. Digital sphygmomanometer was used to measure the actual blood pressure readings of the respondents twice on each occasion and with at least thirty minutes interval in sitting positions. The measurements were carried out three times during the study, two weeks after resumption for the second term of the 2017/2018 academic year, two weeks before the second term examination and two weeks after resumption for the third term.

**Results:** In this work, a rule of thumb was used to connect the perceived stress (PS) and the % change in the systolic blood pressure (SBP) when a subject is stressed, as  $PS=100/(\% \text{ change in SBP})$ . The results show that the group of female students in the general population always feels more stressed than their male counterpart, and respectively in the Islam religion and in the Christian religion always feels more stressed than their respective male counterparts. Also the groups of male and the female students in the Islam religion always feel more stressed than their groups of male and female students in the Christian religion

**Conclusion:** Gender and religion were found to affect the level of perceived stress of the students. It was recommended that male students should be encouraged to go for regular blood pressure checkups as they are more likely not to feel stressed even when their blood pressure has increased much above the normal. This is one of the measurements the health personnel should do whenever a male student in particular is in the health centre. Because the number of Christian students in this work is much larger than the number of Muslim students, more research is needed with comparable number of students in each religious group to further understand how religious practices play a role in perceived stress of college students. Future research should include more variables that influence coping methods and parental influence and guidance.

**Keywords:** *Blood pressure, Examination, Gender, Perceived stress, Religion*

## INTRODUCTION

Stress starts when the emotional, environmental, and physical needs of the individuals compete with one another, and exceed the ability the individual can cope with. It is expressed or felt by a student during his failure to cope with the academic demands, lectures and home works; and the consequence of this will lead to health hazards and problems that can be experienced as head ache, high blood pressure, allergies and other health experiences (Hammen, 2005; Krantz et al., 2013; O'Donovan et al., 2013).

Examination stress is caused by various stressors including, the fear of inadequate preparation for the exam and fear of failing it, the need to pass very well in the exam to satisfy the parental and guardian expectation, and the extra effort made to work harder by burning the midnight oil over the preparation for the examination. Stress can raise the blood pressure of a subject (Gasperin et al., 2009; Sharma, 2011; Unger & Parati, 2005), not necessarily above the normal pressure, and causing the mean blood pressure of a stressed group to be raised (Ajayi & Adegboro, 2020). This is because epinephrine (Adrenalin) and the cortisol hormones are secreted. The blood vessels tighten and the activity of the nervous system and the heart rate increase. As a result, blood pressure increases (Huang et al. 2013; Lovallo, 2010).

A number of environmental factors can change the level of the stress on the student, vis a vis the level to which stress raises the blood pressure. Some of these factors include the gender which the student belongs to, the social class in which the student is involved (Najafi, et al., 2018), the religious movement (Koenig, 2009; Lorenz et al., 2019), the family in which the student is raised and the parental occupation.

Perceived stress is the feeling or thought that an individual has about how much stress he or she is under at a given time or over a given period of time. Men show more stress than women, but the females perceive more stress in the interpersonal domain more than the males (Saxena et al., 2014; Tangade et al., 2011).

Although the importance of stress as a public health issue has been widely recognized, many early studies of stress failed to examine the effect of gender in their data analysis, and studies were often conducted with only male samples (Maranon & Reckelhoff, 2013; Paresh et al., 2019). Recent studies have begun to recognize the influence of gender on stress and have consistently revealed that women report higher levels of chronic and daily stress than men (Calvarese, 2015). In a research by Harshfield et al. (2002) in which 151 boys and 141 girls, between 15 to 18 years old, experienced 5 hours of stress (2 hours of pre-stress, 1 hour of stress and 2 hours of post-stress), the increase in the systolic blood pressure of the boys was higher during the research ( $P = 0.001$ ). This increase is suggested to be caused by slow response of sodium secretion in boys' urine, which increases blood pressure and a possibility of secretion of estradiol in girls, which might delay and decrease the blood pressure. In a different research in which 190 girls between 8 and 16 years of age participated, it was reported that stress due to computer game increases blood pressure (Jagadheeswari et al., 2018). This increase was reported to be less in girls than in boys (Kavya, 2005).

Most of the above works are based on self-reported measurements using some stress scales which may not be completely free from bias, as the participants will often answer questions in a socially desirable manner to avoid the stigma associated with admitting personal inadequacies. It is therefore necessary to use unbiased method of measurement to assess the stress of subjects.

In Nigeria, there are three major religions: the Traditional religion where the followers are called the Traditionalists, Christianity where the followers are called Christians and Islam religion where the followers are called Muslims. Religion strongly influences how college students deal with daily normal stress. The religious active adults tend to have lower blood pressure than those who are less active. This also applies to attendance of religious services and private religious activities (Meng, et al., 2018; Meng et al., 2019; Sorenson, 2011). Cross sectional analysis has revealed consistent differences in the measured systolic blood pressure between frequent and infrequent religious service attenders. Lower blood pressure were observed among those who frequently prayed or studied the bible (Meng et al., 2018; Meng et al., 2019; Sorenson, 2011).

It has been found that religious activities, including prayers reduce stress, anxiety, depression and these results in the overall better mental health of followers (Behere et al., 2013; Carter, 2016). It was also found that prayer in religion also helps the individual to find meaning behind the stressor with an understanding that God is in control (Behere et al., 2013; Carter, 2016).

Jafari (2011) stated that intrinsically religious people felt lower levels of stress and use problem focused coping to a higher degree as compared to extrinsically oriented people. Baqutayan (2011) revealed that religious orientation serves as a coping mechanism among the students in times of stress. Religious sources and skills (religiosity values, praying, and reading of Quran) are significantly related to academic stress for students. Students with these skills are able to control academic stressors during their study at the university (Bataineh, 2013).

Record of the effects of the different religions on stress is scarce to find in the literature. In our present study therefore, both male and female students in different religions were exposed to the same stress of lectures and preparation for the terminal exam during the second term of the 2017/2018 school year. The percentage change in the systolic blood pressure from the beginning of the term to two weeks before the terminal exam was used to find the influence of gender and religion of the students on examination stress. This study was therefore designed to understand the influence of gender and religion on the effect of examination stress on the blood pressure of secondary school students in Oroke High School Akungba -Akoko, Ondo State, S.W. Nigeria.

## **MATERIALS AND METHOD**

In carrying out this research, two instruments were used. The first instrument was a self-constructed, structured, and closed ended questionnaire designed and built around the research questions to obtain the bio-data of the respondents, while the second instrument was the digital sphygmomanometer, used to monitor and record the actual systolic blood pressure (SBP) and diastolic blood pressure (DBP) readings of the respondents.

The readings were taken twice on each occasion with at least thirty minutes interval in sitting position. This was done three times during the study: two weeks into the second term of 2017/2018 academic session when students newly resumed from the New Year holidays, two weeks before the second term examination when all the students were seriously preparing for the second term examination, and two weeks after the resumption for the third term from a two week holidays, however readings taken two weeks after resumption for the third term were not used for this study. Data was analyzed with the use of Statistical Package for Social Sciences (SPSS) version 20.

### **Sampling Technique and Sample size**

Quasi experimental research design was used for this study. The population of the study comprised all the 650 students of Oroke Grammar School, Akungba Akoko.

A sample of 351 respondents that satisfied our criteria for selection, using stratified sampling technique was used. Students had been distributed into different classes in the school before the study and effort was made not to disrupt the natural distribution. Opportunistic sampling technique was used to select all available and willing respondents into this study.

The students used for this sample were those who did not work during the holidays and at home after the school period, making them to be relaxed and to have relatively normal blood pressure when they resumed school. For this group, their blood pressure was raised only by academic/examination stress. Their data of SBP at the beginning of the school term was therefore lower than their systolic blood pressure two weeks to the terminal examination. The respondents whose initial blood pressures were observed to be elevated at the beginning of the term were deliberately removed from the study population.

### **Grouping of data**

The secondary grammar school used for this study was situated in a town where there were many Christians, very few Moslems and a scanty number of believers in other respective religions. Therefore only students in the Christian and Islam religions were used for this study. In order to find the influence of gender on the effect of examination stress on the blood pressure, the whole data was separated into two groups of male and female students irrespective of their religion. Similarly, in order to find the influence of religion on the effect of examination stress on blood pressure, each of these gender groups was separated into two sub-groups of students respectively in Christian and Islam religions. Because the number of students in other religions different from the above was statistically very few, their data were discarded when considering the influence of religion. The detail of the method of collection of data and of obtaining the sample size for this work is already given in a previous paper (Ajayi & Adegboro, 2020).

### **STATISTICAL ANALYSIS**

Stress can raise the blood pressure of a subject (Gasperin et al., 2009; Sharma, 2011; Unger & Parati, 2005), not necessarily above the normal pressure, and causing the mean blood pressure of a stressed group to be raised. The analysis of this work therefore considered the mean % change in the blood pressure of a group of students between the beginning of the term when they were not stressed and two weeks to the terminal exam when they were stressed, to find the influence of the blood pressure modifier on the effect of examination stress on mean blood pressure of the group. The groups considered in this analysis were groups of the male and female students in the whole population, and also in the Christian and Muslim student population in the school. The data were arranged according to these groups to assess the mean blood pressure of the group at the beginning of the term and two weeks to the terminal examination and also the mean % change in the blood pressure. The statistical software SPSS version 20.0 was used to calculate the mean and the standard deviation of the systolic blood pressure of each group when they resumed studies at the beginning of the second term and at two weeks to the second term examination, and also the mean % change in the SBP between the beginning of the term and two-weeks to second term exam. During the discussion of the results, a rule of thumb was

initiated to relate the mean % change in the SBP to the level of perceived stress felt by the different groups.

## RESULTS

Table 1.0 shows the mean age; the mean systolic blood pressure of groups of selected male and female students in the school at two weeks after the beginning of the school term when they were not yet academically stressed and at two weeks to the terminal examination when they were stressed, and also the mean % change in the SBP of the two pressure values. The mean age of the respective male and female groups was about 14 years. The mean systolic blood pressure at two weeks to the examination was higher than its value at the beginning of the term for both groups of male and female students. The mean % change in the SBP between the beginning of the term and two weeks to the terminal examination of the female group of students was lower than that for the male group.

**Table 1.0: The mean age, the mean SBP at the beginning of term and at 2 weeks before the terminal exam and also the mean % change in SBP in that interval for the male and female student groups, in the second term of 2017/2018 school year.**

Gender	No of Students	Mean age (years)	Mean SBP±SD (mmHg)		Mean % Change In SBP
			Beginning of term	2wks to exam	
Male	144	13.6±1.9	98.6±11.9	108.9±10.4	11.2±10.7
Female	207	13.3±1.8	102.1±11.3	111.2±11.9	9.4±10.5

**Table 2.0: The mean age, the mean SBP at the beginning of term and at 2 weeks before the terminal exam and also the % change in SBP in that interval in the second term of 2017/2018 school year for groups of male and female students in different religions.**

Religion	MALE STUDENTS					FEMALE STUDENTS				
	No of Students	Mean age (yrs)	Mean SBP±SD (mmHg)		Mean % Change In SBP	No of students	Mean age (yrs)	Mean SBP±SD (mmHg)		Mean % Change In SBP
			Beginning of term	2wks to exam				Beginning of term	2wks to exam	
Christianity	132	13.5 ±1.8	98.8 ±12.3	109.1 ±10.6	11.2 ±11.0	185	13.3 ±1.8	101.8 ±11.5	111.3 ±10.2	9.8 ±8.5
Islam	10	13.5 ±2.6	95.2 ±5.5	103.5 ±5.6	8.8 ±4.8	12	14.0 ±1.9	104.6 ±6.0	110.8 ±6.8	6.0 ±4.2

It may be seen in Table 2.0 that the mean systolic blood pressure at two weeks to the terminal examination is generally higher than its value at the beginning of the term for both the male and female groups of students respectively in Christianity and in Islam. However, the mean % change in the SBP of the male group of students is higher than that of the female group in each religion and the mean % change in the SBP of the respective male and female groups of Christian students is higher than that of their counterparts in Islam.

## DISCUSSION

The mean % change in the SBP is as a result of the stress on each group and the level to which the modifiers affect the mean SBP of the groups. Because all the groups are subjected to the same teaching and exam stress, one would have expected that the mean % change in the SBP of all the groups will be equal. However because of the different effects of the modifiers on them, the mean % change in the SBP will differ from one group to the other, becoming smaller as the modifying effect is becoming larger and vice versa. It may be seen in Table 1.0 and Table 2.0 that the modifying effect of the male gender on the mean % change in SBP is smaller than that of the female gender, and the modifying effect of the Christian religion is smaller than that of Islam religion, and respectively for both the male and female groups.

Since stress causes a surge of hormones which raises the blood pressure (Gasperin et al., 2009; Sharma, 2011; Unger & Parati, 2005), it is expected that the higher the blood pressure increases, the greater the stress will become. However, the hormones in the male and female subjects are not totally the same (Ajayi & Adegboro, 2020). One of the most important hormones released is cortisol, in response to which the body produces other hormones to counteract its effect (Hamer & Steptoe, 2012; Kelly, 2005; Khoshemehry et al., 2014).

Both the males and females produce oxytocin which is known to calm down the body and induce relaxation. The females produce more oxytocin than the males, making them to feel tired earlier than their male counterpart, while the males in addition produce vasopressin which is known to promote the sense of taking risk (Ajayi & Adegboro, 2020), and making them not to feel stressed even when their systolic blood pressure continues to rise. Thus the females experience a perceived stress earlier than their male counterpart (Dusselier et al., 2005; Eun-Jun, 2009; Shah et al., 2010), resulting in an inverse relation between the mean % change in SBP and perceived stress. This inverse relationship was somehow corroborated by the works of Suter et al. (1997) and Sparrenberger (2009) who found an inverse relation between perceived stress and SBP, though the relationship was not stated.

For the convenience of correlating our data of blood pressure measurements with those of the previous workers who used the instrument of self-report perceived stress assessment questionnaires to obtain perceived stress in an interval, a simple rule of the thumb can meanwhile be introduced to estimate the perceived stress in the interval as the inverse of the mean % change in SBP in that interval. The level of Perceived stress is therefore written as  $PS = 100 / (\text{mean \% change in SBP in the interval})$ . Table 3.0 is constructed using the perceived stress for each group.

**Table 3.0: Perceived stress of each group due to the influence of different modifying factors**

Blood Pressure modifiers	MALE				FEMALE			
	N	Mean Age (yrs)	Mean % Change in SBP	Mean Perceived stress	N	Mean Age (yrs)	Mean % Change in SBP	Mean Perceived stress
Christianity	132	13.5±1.4	11.2±10.0	8.9±7.9	185	13.3±1.8	9.8±8.5	10.2±8.8
Islam	10	13.3±2.6	8.8±4.8	11.4±6.2	12	14.0±1.9	6.0±4.2	16.7±11.7
Whole Population	144	13.6±1.9	11.2±10.7	8.9±8.5	207	13.3±1.6	9.4±10.5	10.6±11.9

Perceived stress =  $100 / (\text{mean \% change in the SBP})$

Tables 1.0 and 2.0 show that when the male and female secondary school students are subjected to the same teaching and exam workload, the mean change in the SBP, vis a vis, the mean % change in the mean SBP of the male group is higher than that for female group. When the value of the mean % change in the SBP is converted into perceived stress shown in Table 3.0, by using the simple rule of the thumb, it is found that the level of perceived stress of the group of female students in the whole population is higher than that of their male counterpart and the level of perceived stress of the group of students in Islam religion is higher than that of the group in Christian religion, respectively for the male and female groups. This observation may be explained with the mode of practice in the different religions.

The higher level of perceived stress in female students than in male students may be contributed by the effect of the hormones, their emotional stress and the extra stress they endure at home. In Nigeria, girls normally participate with their mothers in carrying out domestic chores more than their male counterparts who are left free and rarely do anything, making the females more stressed at home than the males. This reason may stand for the female students at Oroke High school which is a day school and students always go back home after the school hours. In addition, females are more emotional than the males (Brody & Hall, 2008; Chaplin & Aldao, 2013), thus giving them higher emotional stress.

## **CONCLUSION**

This study adds to the body of knowledge concerning the influence of gender and religion on the effect of examination stress on the blood pressure of secondary school students. The study finds that there is a % change in the SBP of the group of students from the beginning of the term to two weeks before the terminal examination. The mean % change in the SBP of the group of male students respectively in the whole school population, in Islam religion and in the Christian religion is higher than that of the group of female students, showing that the % change in the SBP is dependent on gender and the type of religion of the students.

When the mean % change in the SBP is converted to perceived stress, the groups of female students respectively in the whole school population, in the Islam religion and in the Christian religion are found to feel more stressed than their male counterparts. Also the group of male students in the Islam religion will feel more stressed than their male counterpart in the Christian religion, and similarly for the groups of female students.

The gender differences are in general associated with the differences of hormones in the males and the females, the higher emotional stress in the females and the extra daily work stress the females endure at home, while the religion-differences may be associated with the mode of practice in those religions.

## **RECOMMENDATIONS**

Male students should be educated and encouraged to always go for regular blood pressure checkups as they are likely not to feel stressed even when their blood pressure has greatly increased. Health personnel should always suspect and check the blood pressure of the male students when they do not even verbalize or complain of the stress they are going through like their female counterparts.



Because the number of Christian students in this work is very much larger than the number of Muslim students, our result may be inconclusive and more research is therefore needed using comparably equal number of students in the different religious groups to further understand how religious practices play their roll on perceived stress of college students. Future research should include more variables that influence coping methods and parental influence or guidance.

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