# Occupational Stress Level and the Associated Factors among Intern Radiographers in Anambra State, Nigeria

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## ABSTRACT

**Background:** Stress can be defined as a person's psychological and physiological response to the perception of demand and challenges. **Objectives:** This study aimed to evaluate the level and associated factors of occupational stress among intern radiographers in some selected healthcare facilities in Anambra state, Nigeria. **Materials and Methods:** A questionnaire-based design was adopted for this study. Thirty intern radiographers were conveniently selected. The questionnaires were administered to the participants and the completed ones were retrieved immediately. Descriptive and inferential statistics were used for data analysis and p-value was kept at 0.05. **Results:** A total of 100 % (n=30) of the participants experienced occupational stressed in their work places. More than half, 56.7% (n=17) of the participants sometimes felt stressed by the amount of clinical duties they carried out in a day, and 53.3% (n=16) of the participants were always pressurized to increase service delivery to patients in the department. Majority 86.7 % (n=26) perceived workload due to shortage of radiographers as their source of stress. The majority 83.3 % (n=25) of the participants sometimes lose control towards their patients' uncooperative behavior. Gender variation in relation to the level of occupational stress among intern radiographers was not significant (p=0.054). **Conclusion:** A good number of the participants perceived stress at their work place to have significantly affected their job performance and overall productivity. Therefore, healthcare facilities should incorporate organizing stress management workshops into recruitment protocols, to help new employees to cope with occupational stress.

**Keywords:** Intern radiographer, Occupation, Stress, Workplace

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## INTRODUCTION

Stress is one of the rudimentary problems that interfere with human venture in life. These can span from an irritant event or thought that may be frustrating or annoying and act as the body's defense against challenging demands.[1]Though frustrating at some point, not all stresses are bad. Stress can be positive, especially when it helps an individual react in a way that avoids danger and sometimes when it helps one meet a deadline.[1] However, when stress lasts longer than necessary, it poses harm to health. Stress has been given different meaning by different people under different conditions. The first and most generic definition of stress was that proposed by Hans Selye, which states that "Stress is the nonspecific response of the body to any demand".[1] Topper,[2] defined stress as a person's psychological and physiological response to the perception of demand and challenges. According to Shahsavarani et al,[3] stress is any influence of internal and/or surrounding environment on living being which disrupt its homeostasis. Stress can be also defined as any type of change that causes physical, emotional, or psychological strain. Stress is your body's response to anything that requires attention or action.[4]

From the above definitions, stress can be described as the feeling of being under too much physical or mental pressure. Many of life's demands can cause stress, especially work, relationships and financial problems, and when one feels stressed, it can affect everything one does. When this is related to a profession, it is termed occupational stress.[5] Occupational stress or work related stress can be defined as a pattern of reactions that occurs when workers are presented with work demands that are not matched to their knowledge, skills and abilities, and which challenge their ability to cope.[6] This can lead to feelings and physiological reactions that can on the long run be detrimental to all young professionals in relation to performing their duties, especially the intern radiographers.

An intern radiographer is a recent graduate of radiography who undergoes a supervised practical training undertaken with emphasis on job training rather than merely employment.[7] During this internship, occupational stress often stems from unexpected responsibilities and pressures that do not align with a person's knowledge, skills, or expectations, inhibiting one's ability to cope.[8] He or she undergoes some stress by various factors like role ambiguity, which can be due to the shortage of manpower in the medical center or hospital where he or she works; work related problems based on the challenges he undergoes when carrying out radiological investigations and wrong diagnosis due to the type of equipment he is using to carry them out. Other factors that cause occupational stress are role conflict, perceived stress, and social support. negative work load, isolation, extensive working hours, toxic-work environment, lack of autonomy, difficult relationships among coworkers and management, harassment and lack of opportunities or motivation to advancement in one's skill level.[9]

Health workers have been shown to be susceptible to occupational stress. Long-term occupational stress has been associated with a number of ill-health outcomes such as cardiovascular diseases), musculoskeletal disorders.[10] In addition, a close relationship between chronic stress, depression, inflammation, and disorders including obesity, diabetes, arthritis, skin diseases, infectious diseases, and sleep disorders has been found.[10] What is more, the potential outcomes of stress at work are diverse and do not only pertain to health but also cause absenteeism from work and thus, financial losses.[10] Occupational stress may have a lot of negative effect on the radiographer as it tends to affect his relationship with the patient, his family, and also his efficiency in the department. Occasionally stress experienced by radiographers can adversely affect patient care and may possibly trigger psychological conflicts in the radiographer, which concomitantly reduces efficiency in service delivery.[5]

Literature has reported that work stress can cause

burn out. [11,5] and there is increase patient to radiographer ratio in Nigeria.[12] Consequentially, this low ratio could lead to high workload among the few available radiographers, which may also resulted into stress on the trainees(intern radiographers) thereby affecting their learning ability and productivity. There has been a lot of research carried out on occupational stress in the world and also in various aspects of Nigeria as a nation but to the best of the researcher's knowledge, there has been no published study carried out on the level and the associated factors of occupational stress among intern radiographers in this region. This study aimed to evaluate the level and associated factors of occupational stress among intern radiographers.

## MATERIALS AND METHODS

### Study design and setting

This was a cross-sectional questionnaire-based study carried out in approved hospitals and diagnostic centres for internship by Radiographers Registration Board of Nigeria (RRBN) in Anambra State, Nigeria. The centres are denoted with letters A, B, C, D and E.

### Participants

A total of thirty intern radiographers were recruited using a non-probability convenience sampling technique. Only intern radiographers that have worked for at least three months before the commencement of this study were included, while National Youth Services Corps (NYSC) radiographers, qualified practicing radiographers, and all those with working experience less than three months were excluded. This study lasted for a period of three months (September to December, 2021).

### Instruments

A semi-structured questionnaire designed in line with the objectives of the study was the instrument for data collection in this research. It was written in English language and had closed and open-ended questions to enable the intern radiographers to give their own suggestions on how to reduce stress in their department. The questionnaire was made up of 29-item questions divided into four sections, which include sections A, B, C and D. Section A(socio-demographic variables of the participants), B(Occupational stress among Intern Radiographers), C (Sources of occupational stress among Intern Radiographers) and D (The effect of occupational stress among Intern Radiographers). The validity of the questionnaire was calculated using the Index of Item Objective Congruence (IOC) method used by previous authors [13,14] . The content validity of the questionnaire was assessed by computing the IOC. Based on the index parameters, an IOC score >0.6 was assumed to show excellent content validity. All the scores obtained in this study for all the items of the questionnaire after IOC interpretation were >0.6. Cronbach alpha reliability value of 0.87 for internal consistency of the questionnaire was obtained.

The questionnaire was generated in a hardcopy version and administered to the participants by the researchers with the aid of four research assistants recruited for the purpose of this study.

### Ethical consideration

Written permission was obtained from the head of the Radiology Department of the selected study centres. The purpose of the study was duly explained to the participants; their consent was properly sought and obtained using written informed consent form. Their participation was voluntary. No information that revealed the identity of the participants were used for this study and data that were retrieved from the participants were handled with high level of confidentiality, and used for the purpose of this study only.

### Data analysis

The obtained data were exported into Excel spread sheet for statistical analysis. Both descriptive statistics (frequency table, percentage, mean and standard deviation) and inferential statistics (student's T-test) were employed to analyze data

using SPSS version 21(IBM Corp, Amornk, NY, 2012). The students' T-test was used to analyze the gender variation of occupational stress among intern radiographers. The level of statistical significance was set at p-value <0.05.

## RESULTS

Of the 30 participants, males were 53.3% (n=16) while females accounted for the remaining 46.3 % (n=14). Most of the participants 46.7% (n=14) were within the age group of 25-30 years. Forty percent (n=12) of the participants had 5-7 months working experience, followed by those with 8-10 months working experience 33.3% (n=10) and the least 10% (n=3) had 11-12 months working experience. A good number 23.3 % (n=7) of the participants each respectively worked at centre A and E (Table 1)

**Table 1. Socio-demographic distribution of the respondents**

| Question | Freq(n=30) | Percent (%) |
|---|---|---|
| **Gender** | | |
| Male | 16 | 53.3 |
| Female | 14 | 46.7 |
| Total | 30 | 100.0 |
| **Age of the respondents** | | |
| < 25 yrs | 4 | 13.3 |
| 25-30yrs | 14 | 46.7 |
| 31-35yrs | 11 | 36.7 |
| 36-40yrs | 1 | 3.3 |
| Total | 30 | 100.0 |
| **Duration of internship** | | |
| ≤4months | 5 | 16.7 |
| 5-7months | 12 | 40.0 |
| 8-10moths | 10 | 33.3 |
| 11-12months | 3 | 10.0 |
| Total | 30 | 100.0 |
| **Work place** | | |
| A | 7 | 23.3 |
| B | 5 | 16.7 |
| C | 6 | 20.0 |
| D | 5 | 16.7 |
| E | 7 | 23.3 |
| Total | 30 | 100.0 |

Hundred percent (100%, n= 30) of the participants concurred with the incidence of stress in their departments. Majority 70 % (n=21) reported that occupational stress occur intermittently, while the rest participants 13.3 % (n= 4) reported rare stress. Out of 30 participants, 76.7 % (n=23) said that occupational stress occurs more in the morning. Less than half 43.3 % (n=13) reported attending to an average of 31 to40 patients per day (Table 2).

**Table 2: Percentage distribution of incidence of occupational stress among intern radiographers**

| Question | Freq (N=30) | Percent (%) |
|---|---|---|
| **Do you experience occupational stress in your workplace** | | |
| YES | 30 | 100 |
| NO | 0 | 0 |
| Total | 30 | 100.0 |
| **If yes how often** | | |
| Frequently | 9 | 30.0 |
| Intermittently | 21 | 70.0 |
| Total | 30 | 100.0 |
| **When does it occur?** | | |
| Morning | 23 | 76.7 |
| Night | 7 | 23.3 |
| Total | 30 | 100.0 |
| **No of patients** | | |
| 21- 30 | 5 | 16.7 |
| 31-40 | 13 | 43.3 |
| >40 | 12 | 40.0 |
| Total | 30 | 100.0 |

Majority 70% (n=21) of the participants sometimes relate the stress they experienced to the senior radiographers in their departments. Most of the participants (50%, n= 15) always perceived that the ratio of the patients to radiographers in their department was too much. Large number of the participants (56.7%, n=17) sometimes relate their stress to the number of patients they examined in a day. Majority 53.3% (n=16) of the participants claimed they were always pressurized into increasing service delivery to patients and only 10% (n=3) never claimed they were pressurized into increasing service delivery to patients (Table 3).

With regards to the sources of stress, majority 53.3% (n=16) of the participants perceived role conflict and role ambiguity as stressful and the least 10% (n=3) perceived it as very stressful. At least four in five 86.7 % (n=26) of the participants attributed their stressful workload to shortage of radiographers and 13.3% (n= 4) did not attributed their stressful workload to shortage of manpower. Half (50%, n=15) of the participants said maneuvering of equipment in their department was not stressful and the least 10% (n=3) perceived it to be very stressful.

**Table 3: Work load patterns among intern radiographers in the department**

| QUESTIONS | RESPONSE (%) | | | |
|---|---|---|---|---|
| | Sometimes | Always | Never | Total |
| Do you relate The stress you experience to senior radiographers | 21(70%) | 5(16.7%) | 4(13.3%) | 30(100%) |
| Do you feel the number of patients to radiographers is too much | 13(43.3%) | 15(50%) | 2(6.7%) | 30(100%) |
| Do you feel stressed based on the numbers of examination carried out In a Day | 17(56.7%) | 13(14.3%) | Nil | 30(100%) |
| Are you pressured into increasing service delivery to patients in your department | 11(36.7%) | 16(53.3%) | 3(10%) | 30(100%) |

**Table 4. Sources of occupational stress among intern radiographers**

| QUESTIONS | RESPONSE N(%) | | | |
|---|---|---|---|---|
| | VERY STRESSFUL | STRESSFUL | NOT STRESSFUL | TOTAL |
| Role conflict and role ambiguity | 3(10%) | 16(53.3%) | 11(36.7%) | 30(100%) |
| Work load due to shortage of radiographers | 26(86.7%) | NIL | 4(13.3%) | 30(100%) |
| Maneuvering of patients with old and outdated Machines | 1(3.3%) | 13(43.3%) | 16(53.3%) | 30(100%) |
| Repeated Case Due to an outdated equipments | 3(10%) | 12(43.3%) | 14(46.7%) | 30(100%) |
| Maneuvering of equipments in your department | 3(10%) | 12(40%) | 15(50%) | 30(100%) |
| Decision on Exposure Factor selection | 4(13.3%) | 15(50%) | 11(36.7%) | 30(100%) |
| Communication with other Health workers | 7(23.3%) | 23(76.7%) | NIL | 30(100%) |

**Table 5. Effects of occupational stress on intern radiographers**

| QUESTIONS | RESPONSE (%) | | | |
|---|---|---|---|---|
| | Sometimes | Always | Never | Total |
| Do you lose control towards your patients uncooperative behavior | 25(83.3%) | 5(16.7%) | NIL | 30(100%) |
| Do you arrive late at work and leaves as early as possible | 20(63.7%) | 7(23.3%) | 3(10%) | 30(100%) |
| Do you feel confused or frustrated at work | 21(70%) | NIL | 9(30%) | 30(100%) |
| Do you have misunderstanding in your home after coming from work | 16(53.3%) | NIL | 14(46.7%) | 30(100%) |

Fifty percent (50%, n=15) of the participants perceived decisions on exposure factor selection to be stressful and 36.7% (n=11) said not stressful (Table 4).

The results of effects of occupational stress on intern radiographers, revealed that majority 83.3% (n=25) sometimes lose control towards their patients' uncooperative behavior. Greater proportion 70% (n=21) sometimes feel confused or frustrated at work while 53.3% (n=16) sometimes have misunderstanding at their homes after coming from work (Table 5).

There was no statistical significant mean difference of males' level of stress and that of the females (t= 2.033, p = 0.054) (Table 6). Majority 66.7% (n=20) of the intern radiographers managed their stress level at work place by listening to music (figure 1).

**Table 6. Stress level gender variation among intern radiographers**

| SEX | Number | Mean | Standard deviation | Standard Error mean | T-value | P- value |
|---|---|---|---|---|---|---|
| Male | 16 | 2.81 | 0.544 | 0.136 | | |
| Female | 14 | 2.29 | 0.825 | 0.221 | | |
| | | | | | 2.033 | 0.054 |

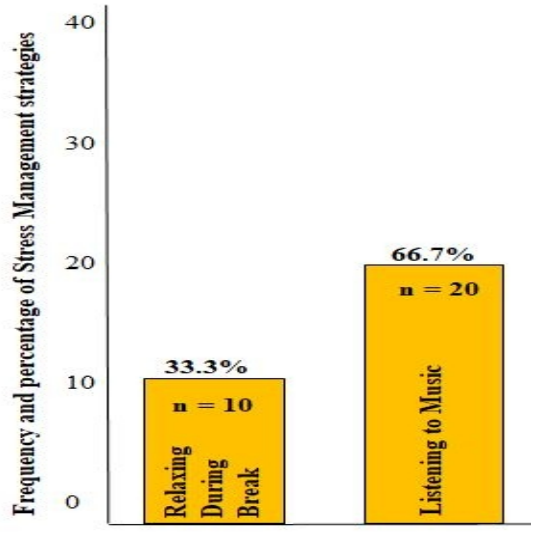


Figure 1: Stress Management Strategies at work place by

## DISCUSSION

The majority of the participants in this study were males when compared to their female counterparts. This finding is consistent with the finding of the study conducted by Ugwu *et al*,[5] which also reported high male preponderance. On the contrary, Mogbeyitere et al,[15] Jagodic *et al*,[16] Alacras et al[17] and Lua et al,[18] reported more females than males population in their studies. The differences in our findings could be attributed to the different number of participants included in each of the studies and also this study included intern radiographers whereas their studies assessed occupational stress among radiographers.

Greater numbers of the participants were in the age group of 25-30years and also, those that had 5-7months working experience were more in this study. This implies more of the new radiography graduands were usually young adults in the first decade of life.

The researchers found out in this study that there was a high incidence of stress as hundred percent of the participants agreed that they experienced stress. This could be ascribed to the fact that there is shortage of radiographers in the study area, as a result, most diagnostic centres ended up employing one or two radiographers to be carrying the work of ten radiographers, and this in turn put much pressure on the intern radiographers working with the few radiographers. This finding is in agreement with the findings of studies conducted by Jagodic et al,[16] Alacras et al, [17] Lua et al[18] and Zare et al,[19] which equally reported high incidence of occupational stress what figure in their study. According to Ugwu et al, [12] hiring more radiographers, usage of advanced technological equipment, well defined job responsibilities and the introduction of stress intervention programs can help to reduce occupational stress among radiographers. Healthcare workers, which intern radiographer is one, have long been recognized to be a highly stressful category and seriously linked with high degree of psycho-social distress when compared with other workers of various sectors.[18]

A good number of the participants perceived their work stress to be occurring intermittently and mostly at the early hours of the day. This was so because

from our experience, most patients usually have appointment with their physicians in the early hour of the day, which also may resulted to increased workload on the intern radiographers at the morning session. In addition, most radiology departments may want to accept large numbers of patients to be attended to in the morning hours of the days.

In this present study, the participants perceived high ratio of patients to radiographers, which usually lead to work stress on their parts as intern radiographers. Despite the fact that large proportion of the participants communicates their level of work stress to their senior radiographers, majority were still pressurized to increase their service delivery to the patients. This result implies that there was shortage of manpower in the radiography units of the various centres, which makes senior radiographers looks ignorance of the intern's, complain of their work stress. Improved communication and good understanding between the intern and senior radiographers could help to alleviate the level of stress on the former. These findings are consistent with the findings of the studies conducted by Alacras et al[17] in Iran and Zare et al,[19] which also reported similar findings. According to Zare et al [19] in their study, they were of the opinion that adequate communication among those working in the hospitals, good employers support for staff and reducing workplace demands can reduce stress level at workplace, especially in the hospitals.

The researchers identified in this study, that the common stressors were role conflict, role ambiguity, workload due to shortage of radiographers and decision of technical exposure factors. Similar findings were also captured in studies conducted by Ugwu et al[12] and Jagodic et al.[16] According to Jagodic et al,[16] conflict between roles showed a great association with stress occurrence. However, Jagodic et al[16] noted that unnecessary radiological investigations, along with role ambiguity, have no effect on the occurrence of stressful behavior. The slight differences in the finding of some aspects of this present study and that of Jagodic et al[16]could be attributed to the differences in the sample sizes used in the various studies. Based on the identified common stressors, Ugwu et al[12] in their study laid emphasis on the hiring of more radiographers, use of high-technological equipment as well as proper job descriptions as ways to reduce stress among radiographers.

The results of effect of occupational stress on our participants, revealed that majority of the intern radiographers sometimes lose control towards their patients' uncooperative behavior. Greater proportion of the participants sometimes feels confused or frustrated at work. A large number of the intern radiographers sometimes have misunderstanding at their homes after coming from work. These findings show that occupational stress has significant negative impact on intern radiographers, which also impacted negatively on their job performance and family life at home. These findings were consistent with the findings of a research done by Ugwu et al,[12] in south eastern Nigeria.

There was no statistically significant mean difference of males' level of stress and that of the females. This means that the stress level experienced by intern radiographers was independent of their sexes. This is in harmony with the finding documented by Jagodic et al,[16] which was carried out on the identification of occupational stressors among radiographers, reported that there were no statistically significant differences in perceived stress in relation to gender or age.

Majority of the intern radiographers managed their stress level at work place by listening to music. The small sample size included in this study is the majority limitation and the results cannot be generalized. Also, only the relationships between genders, duration of internship with stress level were evaluated.

## CONCLUSION

All the participants experienced stress at their work places and this has negative impact on the way they relate with their patients. A good number of the

participants perceived stress at their work place to have significantly affected their job performance and overall productivity. Therefore, healthcare facilities should incorporate organizing stress management workshops into recruitment protocols, to help new employees to cope with occupational stress.

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**Authors' Contributions**

M.P.O, EAO, HUC, JSO designed the study and wrote the draft manuscript with inputs from DZJ DCU, BUM, OOE, CUN and EBE. Data collection and analysis were done by M.P.O, EAO, HUC, JSO. Writing of the full manuscript was done by M.P.O, EAO, HUC, JSO DZJ DCU,BUM, OOE, CUN and EBE. All the authors read through the work and satisfied with the content herewith

**Data availability**

The datasets used or analyzed during the current study are available from the corresponding author on reasonable request

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**Conflict of interest**: None declared.

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