

## Occupational stress among radiographers: the impact of sonography responsibility

Mr. Anthony Chukwuka Ugwu\* MSc, Mr. Ogugua Austine Egwu\*\* MSc, Mr. Ivor Chigozie Nwobi\*\*\* BSc, and Mr. Nnaoma Franza Oluware\*\*\* BSc

\*Department of Radiography, Nnamdi Azikiwe University, Anambra State, Nigeria

\*\* Department of Anatomy, Ebonyi State University, Abakaliki, Nigeria

\*\*\*Department of Radiography, University of Maiduguri, Nigeria

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**ABSTRACT:** Role extension in any occupation can affect both psychosocial and biomechanical stress levels and thus, have some consequences on efficiency in service delivery. The study was aimed to determine the impact of role extension of medical radiographers into sonography. 50 self-administered questionnaires were distributed to radiographers and to sonographers (radiographers with sonography responsibility). The questionnaires included questions seeking information on the demographic profile of the radiographer and sonographer, anatomical regions of biomechanical symptoms/stress and visual analogue scale (VAS), which rated job satisfaction and anxiety levels. 96% of the questionnaires were returned and analyzed statistically using SPSS 11.0 software with  $P < 0.05$  indicating level of significance. Sonographers had more prevalence of biomechanical stress symptoms than the radiographers. Job satisfaction for sonographers (58.75%) was lower than that for radiographers (64.29%). Anxiety level was higher among sonographers even though this was not statistically significant. Sonography responsibility on radiographers did not have any significant effect on psychosocial stress. A balance in the extended role could aid efficiency in service delivery while improving the social strength of the individual.

**KEYWORDS:** Occupational stress; radiographers; sonographers

### INTRODUCTION

Technological change and the increasingly rapid pace of life have contributed to increased levels of stress and burnout experienced by workers and their families<sup>1</sup>. There has been considerable research on stress in certain health care professions; however, very little is known about the importance of occupational stress in radiographers<sup>2</sup> and the possible impact of role extension into sonography. Stress experienced by radiographers can reduce patient's care and may possibly trigger psychological conflicts in the individual (radiographer), which concomitantly grinds efficiency in service delivery. Work

related musculoskeletal symptoms are a group of symptoms characterized by soft tissue discomfort caused or aggravated by work place exposures<sup>3</sup>. These syndromes cause pain, disability and could lead to loss of employment for workers in many occupations<sup>4,5</sup>. These musculoskeletal or biomechanical symptoms have risk factors for their occurrence such as repetitive movement, static postures and muscular activation pattern<sup>6,7</sup>. In this regard, carpal tunnel syndrome has been reported widely as a common biomechanical symptom among sonographers.

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(Corresponding Author: Mr. Anthony Chukwuka Ugwu, Department of Medical Radiography, Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria, Email: tonybullng@yahoo.ca )

In south-east Nigeria, the patient-radiographers ratio is incredibly unbalanced. This is because only a single institution trains radiographers and when they are trained, they seek better jobs abroad. This leads to increased workload on the part of the remaining few, who are eventually tormented by occupational stress. **Ramirez et al<sup>8</sup>** found that job satisfaction and job stress were inversely related to each other. In order to attain relative satisfaction level and improve financial status, many radiographers in Nigeria embark on role extension, predominantly into ultrasound practice and film reporting. The objective of this study was to find out if sonography responsibility on radiographers has led to increased occupational stress.

### MATERIAL AND METHOD

Fifty self-administered questionnaires (number of questionnaires which contained thirty questions for each questionnaire) were designed and sent to radiographers in the five Southeastern states of Nigeria. Questionnaires were used for data collection due to geographical spread and resources available. There are about 60 radiographers in southeast Nigeria.

#### Questionnaire design:

The questionnaire was designed to elicit data that are qualitative and quantitative for factual and attitudinal information to be gathered. It contained 30 questions, which were divided into 3 sections:

- Demographic data completed by the entire respondent.
- Knowledge of occupational stress and how it affects the duty of the radiographers and sonographers (radiographers with sonography responsibility) in terms of *job satisfaction* and *duty induced anxiety level* studied by the visual analogue scale (VAS).
- Open ended question; how can occupational stress be reduced?

#### Sampling and Data Collection:

A convenient and purposive sample of radiographers in hospitals across the five states of south-east Nigeria was approached to participate in this study. Only subjects involved in clinical duties were included while those in the administrative cadre were excluded. All the radiographers were registered with the radiographers' registration board of Nigeria

(RRBN). Ethical clearance from Ebonyi state chapter of Association of Radiographers of Nigeria was obtained. The period of distribution of questionnaire lasted for 3 months and another period of 3 months was allowed before any data analysis took place.

Subjects who had any form of debilitating illness like diabetes mellitus, arthritis or used walking aids were excluded from this study. A total of 48 questionnaires were returned and analyzed statistically with SPSS 11.0 software with  $P < 0.05$  indicating level of significance.

### RESULTS

A total of 48 (96%) questionnaires were returned within 3 months. Responses were received from all the south-east hospitals used in this cohort study. The ages of subjects ranged from 29-33 years including only three females and hence, data was not categorized according to sex and age.

**Table 1** Shows the percentage prevalence of biomechanical stress symptoms in the anatomical regions studied for each duty group. Upper back and middle back (55.6%) was the most prevalent for the sonographers (those involved with X-ray and Ultrasound) while hand/finger pain (42.9%) was the most prevalent among the Radiographers (X-ray only). Generally, Sonographers were presented with higher prevalence of biomechanical symptoms of stress than the Radiographers. This was seen in all anatomical regions studied except in the hand/finger and the neck where the prevalence was higher for the radiographers (42.9% and 28.6% for hand/finger and neck respectively) as compared to sonographers who had 11.1% and 22.2% stress symptoms in the hand/finger and the neck respectively.

**Table 2** shows descriptive statistics for job satisfaction and anxiety level. The average job satisfaction level for the radiographers (64.29%) was higher than that of the sonographers (58.75%). The average anxiety level was higher for the sonographers (46.25%) than the radiographers (42.86%). Pearson's correlation revealed that there was no significant relationship between job satisfaction rating ( $P > 0.05$ ,  $r = 0.387$ ) and anxiety level ( $P > 0.05$ ,  $r = 0.258$ ).

**Table1: Cross tabulation of duty and prevalence of symptoms**

Anatomical Regions	Duty (N)	% Prevalence of symptoms experiences
Neck	Radiography (30)	28.6%
	Sonography (18)	22.2%
Upper Back	Radiography (30)	28.6%
	Sonography (18)	55.6%
Middle Back	Radiography (30)	14.3%
	Sonography (18)	55.6%
Lower Back	Radiography (30)	28.6%
	Sonography (18)	44.4%
Hip	Radiography (30)	28.6%
	Sonography (18)	33.3%
Wrist	Radiography (30)	14.3%
	Sonography (18)	22.2%
Shoulder	Radiography (30)	14.3%
	Sonography (18)	22.2%
Elbow	Radiography (30)	0.0%
	Sonography (18)	22.2%
Hand/Finger	Radiography (30)	42.9%
	Sonography (18)	11.1%
Eye	Radiography (30)	0.0%
	Sonography (18)	11.1%

**Table 2: Descriptive statistics for Job satisfaction and Anxiety Level**

		Number (N)	Mean	Standard deviation
Job satisfaction	Radiographer	30	64.29	11.34
	Sonographer	18	58.75	12.46
Anxiety Level	Radiographer	30	42.86	20.59
	Sonographer	16	46.25	18.47

**DISCUSSION**

Stress can be defined as an interference disturbing an individual’s well being physically and mentally<sup>9</sup>. In the work place, it is called occupational stress. For the radiographers, it is a result of increased demands for efficiency in order to serve significantly more number of patients per day. This triggers pressure within, which manifests in biomechanical disorders or pain. Thus, giving rise to two forms of occupational stress- biomechanical and psychosocial stress.

Stress compels the individuals suffering from it to seek adaptive measures. Radiographers in Nigeria who suffer stress, try to adapt their involvement in role extension into sonography possibly to gain more satisfaction. The option of role extension through changes in pattern of skill demonstration and the accompanying increase in remunerations may offer suppressive effects on stress. However, the results from this study showed that sonographers (radiographers with

sonography responsibility) had a higher prevalence of biomechanical symptoms of pain than the radiographers. This occurred in all anatomical regions examined except the hand/finger and the neck regions. The exception could be as a result of the continuous moving of bulky X-ray machines with the hands without adequate rest intervals by the radiographers. This excessive hand movement is usually accompanied by increased trapezium activity<sup>10</sup>, which is a consequence of the increased neck pain. The bare data in **Table 1** showed that the role extension into sonography does not suppress the occurrence of biomechanical stress symptoms.

Psychosocial stress was assessed using job satisfaction rating and anxiety level induced by workload. Results show that the Radiographers had a higher job satisfaction (64.29%) than the sonographers (58.75%) indicating that role extension into sonography may have reduced

satisfaction. Also, the anxiety level was equally higher for the sonographers (46.25%). **Ramirez et al**<sup>8</sup> found that job satisfaction and stress were inversely related to each other. Since psychosocial and biomechanical components of occupational stress are related, it would be right to propose that the sonographers had higher occurrence of psychosocial stress than the radiographers even though t-test showed insignificant difference for both satisfaction and anxiety levels ( $P>0.05$ ).

From the aforementioned, it is evident that role extension into sonography has no positive impact on stress. But the question arises: why do these individuals undertake such practices? Hence further studies are advised to investigate the effect of age, sex and reasons why radiographers get involved in sonography practice. Stress, health, performance in the workplace, the family and the social network all go to make an integrated whole. And so, the social implications of role extension may be the major reason for such practices. A typical example of social implication is the remuneration accruing from the practices. In addition to the effect of role extension into sonography on stress level among radiographers, though not significant, there could also be an increase in clinical correlation ambiguity, which may occur when the sonographer lacks enough clinical knowledge of his imaging findings that will give a good base for judgment, which could be due to lack of specialization.

### CONCLUSION

Sonography responsibility among radiographers does not improve stress management nor suppress stress itself; rather it may increase the occurrence of psychosocial and biomechanical stress levels. However, following the remunerations accompanying its practice, there should be a balance that will not affect the health status of the professional and at the same time improve the individual's social network and family circle without compromising efficiency in service delivery.

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