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## **Attitudes and Barriers to Post Graduate Education among Radiographers in South Eastern Nigeria**

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### **ABSTRACT**

**Background:** This study is aimed assessing the attitudes of radiographers and perceived barriers to postgraduate radiography education in south-eastern Nigeria.

**Methods:** The study utilized a self administered pre-tested questionnaire with structured and semi-structured questions. Respondents were practicing radiographers working in private, general and teaching hospitals in south-eastern Nigeria. A total of forty-one (41) radiographers participated in the study. This study was carried out in South-Eastern Nigeria made up of five states namely; Anambra, Enugu, Imo Abia and Ebonyi states. All radiographers in South-Eastern Nigeria who agreed to participate in the study were included. The following categories of registered radiographers were included in the study, Intern radiographers (fresh graduates), Youth corper radiographers (those undergoing one-year mandatory post-qualification national service) and radiographers currently in practice with or without post graduate certificate.

**Results:** Physical, attitudinal and structural barriers were identified as obstacles to postgraduate radiography education. No significant correlation existed between attitude and all the categories of barriers in this study. A set of numerical scores ranging from 1.0 to 5.0 were assigned to the attitudes, otherwise called 'attitude scores'. A score of 1.0 represents a less positive attitude, while a score of 5.0 represents a very positive attitude. Attitude scores to organizational barrier ranging from 2.70 to 3.67 were recorded among administrative cadre radiographers (chief and assistant chief). Environmental barrier score was found to be the least among M.Sc radiographers (2.46) and highest among

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radiographers in private establishments (3.58). Organizational barrier was noted to be significantly higher than other barriers. This study has shown a very positive attitude of radiographers towards postgraduate education. Organizational (university) barrier is perceived as the most dominant bottleneck. The study recommends the establishment of more post-graduate radiography programs in Nigerian Universities, recruitment of more lecturers as well as reduction in the duration and cost of undertaking such programs.

**Conclusion:** The authors recognize that achieving a higher level of competence and professional expertise through post-graduate education requires commitment and cooperation between the individual radiographer, the employing organization and the tertiary institution. Furthermore, recognizing the dynamics and complexity of health-care systems, it would not be sufficient to make broad suggestions indicating that identified barriers to continuing formal education can be solved by implementing short-term plans.

*Keywords: Radiographers; attitudes; barriers; perception; postgraduate education.*

## 1. INTRODUCTION

The World Health Organization World Health Report (WHO 2000:76) recognizes human resources, as the most important resource input in any health system. It can be safely argued that the performance of health care systems, ultimately depend on the knowledge, skills and motivation of the people responsible for delivering such services. The World Health Report therefore emphasizes on the need for strategic planning with regard to continuing education for health care providers.

Generally, the public expects health care professionals to have up-to-date knowledge and skills appropriate to the specialist field in which they practice. Health care professionals therefore need to be equipped to meet these challenges (Astedt-kurki and Haggman-Laitila, 1992; Jooste, 2003; Department of health, 1999). In Nigeria, Radiographers are increasingly involved, in X-ray, CT, MRI, ultrasound investigations and various degrees of clinical role extensions. It is therefore imperative that they possess more than just their basic clinical knowledge and expertise if they are to meet the demands of a changing health care system and the expectations of an increasingly aware and informed patient population (Ugwu et al., 2009).

With the advent of new technologies, old skills may become less relevant, hence justifying the need for continuing education and training. Anecdotally, there are very few radiographers worldwide; far below the WHO bench mark for expected number of radiographer per population which is 1: 10,000. The acquisition of skills will not be possible in the absence of well trained lecturers and radiographers (Mecrabeau et al., 2001). Education and training are therefore critical to the future of a profession as they equip members towards adapting to their changing environment and knowledge explosion (Piper et al., 1991).

At the undergraduate level, the public expect health care professionals, not only to have the necessary academic qualification but also the practice-based skills required by the registering authorities and employers. Postgraduate education is important in Radiography especially because of the rapid innovations and advances in diagnostic equipment and its accessories as well as continuous progress in medical sciences and specialization. Consequently, professionals require continuing education and professional development to

enhance their services; ensure continued competence as practitioners and to maintain a valuable role in the workplace. The above requirements are key issues for most health regulatory bodies such as the Health Profession Council in UK and The Radiographers Registration Board of Nigeria (RRBN). In Nigeria for instance, fresh radiography graduates (Interns) are expected to attend a computed tomography course continuous professional development (CPD) before full licenses are given. Both training in CPD courses and training of university graduates require competent postgraduate radiographers. Furthermore many Universities have started undergraduate (B. Sc.) programs in Nigeria, despite the presence of very few radiographers with postgraduate degrees. The theory and practice of learning and teaching encourages individuals to become autonomous and take responsibility for developing their professional knowledge and skills and to place value on lifelong learning (Bond et al., 2006). This can only be achieved when individuals show keen interest and engage in post-graduate education. Although there is a robust literature relating to post-graduate medical education, there is scanty data on the barriers to post-graduate education among radiographers in Africa and particularly Nigeria.

This study was therefore designed to assess the attitude and barriers to post graduate education among radiographers in Nigeria.

## **2. METHODS**

The study design is predominantly quantitative, and utilized structured self-administered questionnaires administered to forty-one (41) practicing radiographers. The confidentiality and anonymity of the individuals completing the questionnaires were ensured. Questionnaires were distributed by a third party and there was no direct contact with any of the participant. The questionnaires were anonymized and participant's place of work was considered insignificant and therefore not included. All the participants gave their consent to use the information provided by completing and returning the questionnaire and this was explained in the cover letter.

Validity of the questionnaire was assured through the pilot study with the corresponding target participants using a similar approach by Johnson et al. (2000). One clinical radiographer without a post-graduate qualification and another with post-graduate degree participated in the pilot study. The radiographer with post-graduate qualification identified organizational barriers such as duration of course, difficulty in obtaining admission and lack of time; the latter felt that the environmental factors pose the highest barrier to post-graduate education.

Each questionnaire contains 3 sections namely A, B and C. Section A sought demographic information like sex, age, qualification, marital status, rank and job description. Radiographers within the age range of 20 to 40 were classified as young while those within the age range of 41 to 60 were classified as old.

Section B sought attitudinal questions with 5 points Likert scale as well as questions on barriers which are categorized under 3 points; organizational barriers (institutional), Individual barriers and Environmental barriers. Section C was an open ended question seeking opinions on how to improve radiographers' enrolment in postgraduate studies. This study was carried out in South-Eastern Nigeria made up of five states namely; Anambra, Enugu, Imo Abia and Ebonyi states. All radiographers in South-Eastern Nigeria who agreed to participate in the study were included.

The following categories of registered radiographers were included in the study, Intern radiographers (fresh graduates), Youth corper radiographers (those undergoing one-year mandatory post-qualification national service) and radiographers currently in practice with or without post graduate certificate.

Descriptive statistics like mean, median, mode, standard deviation, minimum, maximum frequency and percentages were used in the analysis of data. Also, inferential statistics like Pearson's product moment correlation co-efficient was done using SPSS version 16.0. STATGRAPHIC version 5.0 was used in the test of hypothesis of two independent means. P-values of 0.05 were used as criteria of statistical significance.

Content analysis of comments made by radiographers in section C were categorized into sub-themes and analyzed descriptively in percentages.

### **3. RESULTS**

#### **3.1 Demographic Characteristic of Radiographers**

It shows the demographic statistics of the various respondents. The age, gender, qualification, marital status, rank, year of graduation and place of work for each respondent are as shown in table 1.

All attitude items in the questionnaires correlated with the average attitude score. Attitude score is calculated by summing the score and each scale and dividing by the total number of respondents. For example, Strongly disagree has a scale of one (1), Disagree (2), I don't know (3), Agree (4) and Strongly agree (5). A ratio of summation of the composite scales as indicated by respondents for each barrier and total number of respondents, gives the attitude score.

The strongest correlation between attitude items and average scores were found among radiographers who believe that post graduate education will positively affect both their practice ( $r=0.614$ ,  $p=0.000$ ), as well as patients care ( $r=0.607$ ,  $p=0.000$ ). Mean values  $\pm$  SD (standard deviation) of the scores for perceived organizational barriers, individual barriers and environmental barriers were noted to be  $3.23 \pm 0.83$ ,  $2.18$  and  $2.980 \pm 0.64$  respectively (ANOVA). The above figures indicate a significant difference between the 3 barriers. Since the most positive scale is 5 representing 'strongly agree', values become more significant and show more positive correlation as they approach a value of 5. Consequently, organizational barrier (university generated barrier) is considered as the strongest barrier to post graduate education among radiographers in south eastern Nigeria. Organizational barriers showed a positive and significant correlation with individual barrier ( $R=0.44$ ,  $P=0.003$ ), and environmental barrier ( $r=0.430$ ,  $P=0.005$ ).

No significant correlation (Pearson's) was observed between attitude and all the barriers in the study ( $P>0.05$ ).

Furthermore, correlation statistics between average attitude score and each of the variables used to assess attitude shows that environmental barrier is the greatest factor affecting attitude of radiographers to post graduate education in Nigeria.

Table 2 shows the rating of attitudes of the respondents represented by scores and relationship to the various barriers to post-graduate education. Table 3 shows the

independent T Test values between the different groups of radiographers, significant difference exist in barrier rating as shown in the table.

**Table 1. Demographic characteristic of radiographers**

<b>Variables</b>		<b>Frequency</b>	<b>Percent</b>
Age range(years)	21-25	8	19.5
	26-30	8	19.5
	31-35	8	19.5
	36-40	6	14.6
	41-45	6	14.6
	51-55	5	12.2
	Total	41	100
Gender	Male	24	58.5
	Female	17	41.5
Marital status	Single	15	36.6
	Married	25	61.0
	Widowed	1	2.4
Appointment	Full time	33	80.5
	Part time	8	19.5
Place of work	Govt.	35	85.4
	Private	6	14.6
Qualification	DCR	4	9.8
	B. Sc	31	75.6
	M. Sc	6	14.6
Rank	Others	32	78
	Chiefs	9	22.0
Year of graduation	1970-1980	4	9.8
	1981-1990	3	7.3
	1991-2000	9	22.0
	2001-Date	25	61.0

**Table 2. Respondent's rating of attitude and barriers**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Skewness</b>	<b>Kurtosis</b>
Attitude	41	3.170	5.000	4.32854	482510	-0.455	0.431
Org Barrier	41	1.000	4.670	3.21171	846141	-0.291	0.416
Indv Barrier	41	1.000	4.000	2.18902	572225	-0.335	1.684
Env Barrier	41	1.000	4.250	2.94512	68582	-0.536	1.470

Content analysis showed that eight (8; 19.51%.) of radiographers wanted more lecturers to be employed, while nine (9; 21.95% believed that there should be more universities offering postgraduate education in radiography. Eight of the radiographers think that the duration as well as the cost of post-graduate programs should be reduced. Only 2 radiographers (6.56%) believe the regulatory body (Radiographers Registration Board of Nigeria (RRBN) should increase the awareness of radiographers towards post-graduate education. Three (8.0%) of radiographers believe that hospitals should encourage their workers to enroll into postgraduate education.

**Table 3. Independent T-Test between different groups of radiographers**

<b>Variable</b>	<b>Attitude Means</b>	<b>P Values</b>	<b>Organizational Barrier Means</b>	<b>P value</b>	<b>Individual Barriers means</b>	<b>P value</b>	<b>Environmental Barriers Means</b>	<b>P values</b>
Young	4.35	P>0.05	3.36	P>0.05	2.2	P>0.05	3.02	P>0.05
Old	4.27		2.82		2.16		2.75	
Male	4.36	P>0.05	3.19	P>0.05	2.22	P>0.05	2.88	P>0.05
Female	4.28	P>0.05	3.24	P>0.05	2.15	P>0.05	3.04	P>0.05
DCR/B Sc	4.35	P>0.05	3.29	P>0.05	2.24	P>0.05	3.03	P>0.05
M Sc	4.2	P>0.05	2.78	P>0.05	1.92	P>0.05	2.46	P>0.05
Lower ranks	4.35	P>0.05	3.35	P<0.05	2.27	P>0.05	3.02	P>0.05
Chiefs/Ass. Chief	4.24	P>0.05	2.70	P<0.05	1.89	P>0.05	2.69	P>0.05
Full time	4.34	P>0.05	3.11	P>0.05	2.06	P<0.05	2.90	P>0.05
Part time	4.3	P>0.05	3.63	P>0.05	2.72	P<0.05	3.6	P>0.05
Government	4.34	P>0.05	3.13	P>0.05	2.13	P>0.05	2.84	P<0.05
Private	4.24	P>0.05	3.67	P>0.05	2.54	P>0.05	3.58	P<0.05

*P>0.05= no significant      P< 0.05= Significant.*

#### **4. DISCUSSION**

In a competitive health environment such as in Nigeria, remuneration of health workers is majorly based on their academic qualification, especially in public/government establishments. Radiographers ought to be empowered to compete or measure up with other allied health professions. Empowerment relates to the sense of self worth and competence that comes from having the skills and abilities to carry out one's required job. Such skills can only be acquired through a process of continuing professional development and post-graduate education. Empowered health care professionals can perform their jobs more confidently and more effectively than those who are not empowered. Empowerment is the confidence to take control of a job and use the autonomous decision-making skills of a professional, thereby creating an environment where personal growth is encouraged and conflict is managed collaboratively (Gary, 2002). Effective continuing professional development has been linked with raised staff morale, increased motivation and staff retention (Mackereth, 1989; Smith and Topping, 2001)

Many researchers have discussed barriers to continuing professional development, which can be categorized as physical barriers, attitudinal barriers and structural barriers, or the similar categories of situational, institutional and dispositional barriers as described by Cross (1981). Physical barriers or situational barriers are those factors in the individual's life circumstances at any given time. Numerous authors and researchers have identified physical barriers, which include: lack of time because of job responsibilities; family and child care responsibilities; difficulty in paying course fees and fear of losing benefits; difficulty with academic reading and writing; difficulty with English if this is not the learners first language; and difficulty with numeracy (Ferguson, 1994; Yeun, 1991; Nolan et al., 1995; Kersaitis, 1997). Research among medical practitioners identified that only a small number of professionals had poor motivation toward their own continuing education. However, many encountered difficulties in these endeavors as a result of lack of time, work schedules and personal commitments (Eales, 2001).

Attitudinal barriers or dispositional barriers refer to attitude and self perceptions about oneself as a learner. Authors and researchers have identified attitudinal barriers as: negativity due to unpleasant past experiences in academia; lack of emotional and physical energy; being nervous about going back to the classroom; and concern about not being able to keep up academically. These results in the health care professional have low aspirations and doubts about the value of continuing professional development; low self esteem; lack of confidence; both generally and in relation to learning and lack of trust in formal institution (Ferguson, 1994; Yeun, 1991; Nolan et al., 1995; Xaba and Phillips, 2001; Horton-Deutsch and Mohr, 2001).

Structural barriers to postgraduate education and continuing professional development can be regarded as being synonymous with institutional or organizational barriers. These are the practices, procedures and policies that place limits on opportunities for potential adult learners to participate. Structural barriers have been identified as lack of transport and limited opportunities for learning near to the potential learner's place of residence. Staff shortages may limit opportunities for learning. Lack of knowledge about learning opportunities, prohibitive entry requirements to post-registration programs, lack of appropriate programs and late advertising of professional educational events are cited as barriers to postgraduate education and continuing professional development. The lack of coherent staff development plans, difficulty in obtaining study leave (Barriball and While, 1996; Yeun, 1991; Nolan et al., 1995). Majority of respondents are full time staff working in

government hospitals, where the head of departments are most likely to be doctors (radiologists), who may not be readily disposed to continuous acquisition of skills by radiographers with attendant quest for clinical role extension. This is a common scenario in Nigeria, and explains the high score for organizational barriers noted in this study. Furthermore, only two Universities offer post-graduate programs in Radiography in Nigeria; enrolment requirements are stringent and limited vacancies are available for prospective students. Combined, these can translate to high organizational barrier scores noted by the authors.

Least scores were obtained for individual barriers. This can be explained by an increasing awareness for post-graduate education among radiographers. The Association of Radiographers of Nigeria (ARN) and the Radiographers Registration Board of Nigeria (RRBN) have severally used national conferences as avenues to call on radiographers to be actively involved in Continuing Professional Development (CPD) as well as postgraduate education. This development combined with changes in professional structure of radiography practice in Nigeria ranging from increased job opportunities, role extension, remuneration and increase in number of universities offering radiography has led to an increasing proportion of radiographers seeking enrolment into postgraduate courses.

The attitude and barrier score (Table 2) followed a Gaussian response indicating that the scales used in this study are reliable in measuring attitude and barriers

No significant correlation existed between attitude and all the categories of barrier in this study. The least organizational barrier of 2.70 and maximum of 3.67 were recorded among administrative cadre radiographers (chief and assistant chief) and environmental barrier score was found among M.sc radiographers (2.46) and highest among private based radiographers (3.58). Content analysis of comments made showed that 19.67% predominantly believed that the time spent in the program is much and also so much money is involved. A particular radiographer noted that the first postgraduate program started in the early 90's, producing less than 30 graduates at the M.Sc level and none with a PhD. A significant difference in perception of environmental barrier existed between government and private practitioners. Part time radiographers showed a significantly higher perception of individual barriers than full time radiographers, while chiefs and assistant chiefs showed a significantly low perception of organizational barriers compared to others. Higher perception of environmental (institutional) barrier among private based radiographers could be due to heavy workload in private sector which may make it difficult for their workers to be involved in postgraduate education. Significant difference in attitude occurred between any of the groups.

Staffing is a management decision in any establishment as it beholds the management to take decision about employment. The result of this study indicates a significantly higher perception of environmental (institutional) barrier among privately employed radiographers who undertake so-much of clinical work. This finding is in agreement with those of Henwood et al who noted inadequate staffing and associated workloads as major handicaps towards continuing professional development (CPD). Radiographers working in the private establishments may not have sufficient time for heavy lectures and rigorous research activities which are components of post-graduate training. Result of the content analysis showed that radiographers perceive that cost of running the program is high. This is similar to a previous study which showed that cost is a significant barrier to CPD participation (Henwood and Huggett, 1999). Related to the above, are issues of availability, funding and lack of social support as described by Castle, et al..

Scores in attitude are quite high in this study with average above 80% above 4 on a 5 point scale among all categories of radiographers (Table 3). This is not congruent with that of a previous study (Henwood et al., 2004) which reported ambivalent (positive and negative) attitude toward CPD among radiographers.

The major limitations of this study include the relative inflexibility of the questions on barriers, as well as the fact that the study was conducted over a period of a month. Studies like this assessing concepts as qualitative as attitude and barrier which are subject to change as a result of changing environmental factors and confounding variables should be conducted over a long period. Future studies involving time series design should be adopted to assess the effect of environmental, organizational and professional issues on radiographers' attitude on perceived barriers to postgraduate education. A follow up study with a more flexible questionnaire, incorporating some aspects of the responses of radiographers, better description of the variables used in the Likert scales and recommendations of this study is encouraged.

This study has shown a very positive attitude of radiographers towards postgraduate education with organizational (university) perceived barrier as the most dominant bottleneck as reported by radiographers. Universities engaged in postgraduate training should understudy their counterparts in UK and institute a master-plan that will make the program run faster without dilution of standards.

The study further shows that job enhancement is the main significant motivation for involvement in continuous professional development (CPD).

## **5. CONCLUSION**

1. The relationship between attitude and barrier scores followed a normal distribution (Gaussian response) indicating that the scales used in this study are reliable in measuring attitude and barriers.
2. No significant correlation existed between attitude and all the categories of barrier in this study.
3. The study recommends the establishment of more postgraduate radiography programs in Nigerian Universities and recruitment of more lecturers. Furthermore, the cost and duration of existing post-graduate programs should be drastically reduced.
4. The authors recognize that achieving a higher level of competence and professional expertise through postgraduate education requires commitment and cooperation between the individual radiographer, the employing organization and the tertiary institution. Recognition of the barriers to postgraduate education demands a collective response from the organization and the individual radiographer to overcome these. In view of the complexity and dynamics of healthcare systems, it would not be sufficient to make broad suggestions that identified barriers to continuing formal education can be solved by implementing short-term plans.

## **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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