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Level of Professional Competence of Radiologic Technologist in Davao City on Factor Selection of X-Rays of Skull, Extremities and Chest

Richard Pabunag et al
Davao Doctors College, Davao City

ABSTRACT

The study was conducted to determine the professional competence of radiologic technologist in Davao City in factor selection on x-rays of skull, chest and extremities. Specifically, the study determined the profile of the respondents in terms of age, educational attainment, institutions where they are currently working and number of years in service; the level of the respondents professional competence on factor selection of x-rays in terms of skull, chest and extremities (upper and lower limbs); the respondents' professional competence on factor selection of x-rays associated with the respondents' profile. The study is generally descriptive correlational in nature. As such, the statistical treatment of data included frequency counts, arithmetic mean, chi-square, Pearson-r, Kruskal walis one-way ANOVA and Mann-Whitney U test. The researches presented the literatures and studies that have bearings on the study such as professional competence and importance of factor selection. The results revealed that the professional competence of the respondents on factor selection on x-rays differ significantly when they are grouped according to the different variables. It was also found that majority of the radiologic technologist belongs to the 21 – 25 years old bracket. Among the respondents 18 were BS Radiologic Technology graduates with one having a certificate of RT training; 19 out of 22 were equipped with their skills at college/university trainings; 12 are working at institution B, 6 from institution A and 3 working at institution C. Majority of them served for 1 – 5 years. It is recommended that medical institutions uphold the continual education of the radiologic technologists as they progress in years of service so as to equip them further in their field. Further more, the research team recommends that institutions offering a program on Radiologic Technology put premium on allowing the students to apply the theories learned into praxis. This may include a more dynamic internship program as this may become a means by which the competence of the interns will be put to test.

Keywords: Professional Competence, Radiologic Technologist, Skull, Extremities and Chest

INTRODUCTION

The rise of technology has revolutionized the field of medicine. The coming of high technology equipment certainly made a great impact in the practice of medicine. In today's world, more and more researches are focused on producing new products, methods and technologies for healthcare. One of the major departments among hospitals

that have become accustomed with this technological advancement in the medicine world is the filed of Radiology.

Radiology has become an essential aspect of diagnosing different pathological conditions. Today's imaging department consists of an impressive array of diagnostic and therapeutic devices...it would be difficult to diagnose or treat many medical problems without this team of radiology services (Callaway, W.J., Durley, L.T. © 1992)

Given this, man has become more and more dependent on these technologies. Among these are the diagnoses of pathological conditions using the x-ray equipments. X-ray imaging is the fastest and easiest way for a doctor to view and assess chest diseases, broken bones and cracked skull (http://www.queenelizabeth.nhs.uk/pdfs/imaging/Radiography.pdf). However, the quality output of this equipment is linked with the performance and competence of the one manipulating the x-ray machine which is the radiographers or the radiologic technologist. When we talk of professional competence, we refer to patient's expectations that the professional they come into contact with will be up to the job. Professionals should be able to do that which they profess they can do (http://www/pharmabiz.com/article//detnews.asp?articleid=22231&sectionid=46). The radiographer excels in the art and science of making radiographs. Once the physician has determined the need for radiographic studies, it is up to the radiographer to obtain the best possible diagnostic radiographs (Callawa. & Durley, 1992).

In the Philippines, the number of radiologic technologists is progressively arising as the country is adapting with the demand of radiologic equipment nationally and even in local places. However, a recent study was conducted on three radiology department doing x-ray examinations especially with the common procedures like x-rays on skull, extremities and chest. The study pertains to the factors related to repeated radiograph with the said institutions, and surprisingly exposure factor was addressed as one of the major cause of repeated radiograph. Inaccurate exposure is highly revealed as factor associated with the mean of 3.82 (Tabada, et al. 2007:29).

The radiographer must be equipped and competent in selecting appropriate exposure factors to be used for image production. Radiologists' accuracy in diagnosing pathologies is influenced by an output of the exposure done by the technologists. Radiographers must possess a complete understanding of the entire radiographic process to minimize repeated exposures. Radiographs generally need to be repeated for such reasons as improper exposure factor selection (Carlton & Adler. ,1996). Therefore the knowledge of the radiologic technologists on exposure factor in terms of kilovoltage peak (kVp) and milliampere second (mAs) selection or application is considerably essential in production of accurate radiographic images.

The researchers, as Bachelor of Science in Radiologic Technology interns are more concerned on the level of professional competence of radiologic technologists in Davao City particularly on three affiliating centers: institutions A, B and C. The study seeks to assess the cognitive state of these radiologic technologists specifically on exposure factor selection as linked with the respondents' profile. The study would be most helpful to institutions offering Radiologic Technology Programs, hospital administrators, educators, students and patients.

METHODS

The study has descriptive correlational design. It seeks to determine the level of professional competence of radiologic technologists in Davao City on factor selection of x-rays of skull, chest and as of the extremities and how it is link with the respondents' profile.

The respondents of the study are Radiologic technologists of three medical institutions in Davao City namely, Institutions A, B and C.

The respondents are specifically assigned on general radiography which covers x-ray procedures only. The total population of the respondents coming from the three institutions is 24. As such, the researchers will made use of total enumeration in conducting the study. All the 24 Radiologic Technologists were chosen to participate in the survey.

However, due to the unpredictable schedule of availability of some of the respondents as well as the limited time with which the study was conducted, only 21 or 87.5% of the total number of respondents were able to participate in the study.

The study took place in three selected medical institutions in Davao City, Philippines. The study is perceived to be reasonable in terms of number of patients accommodated a day and the nature of radiologic technologists' profile present in the following medical institution.

The research questionnaire is composed of two major parts. The first part of the questionnaire consists of questions pertaining to the profile of the respondents.

The second part consists of questions of the respondents' level of professional competence on factor selection on x-rays of skull, chest and extremities. The questions are specifically structured in such a way that assesses the respondents' acquired knowledge on factor selection.

The researchers were able to carry out the study through the following procedure:

1. A letter of permission was given to the respective Head officers of the Radiology Department if institutions A, B, and C, which stated the conditions to authorize the researchers to conduct the study according to the characteristics of respondents needed for the research.
2. The approved letter was given to the Chief Radiologic Technologist of institutions A, B, and C.
3. The researchers then distributed the questionnaires to the identified respondents of institutions A, B, and C.
4. After all survey questionnaires were duly accomplished, the researchers ten made the necessary steps in treating the data collected.

The first research problem is presented through frequency counts in order to describe and categorize its characteristics according to the respondents' profile. To answer research problem number 2, an arithmetic mean $\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i$ was employed so as to identify the respondents' level of skills on factor selection of x-rays of skull, chest and extremities.

Chi-square $x^2 = \sum \frac{(f(a)-f(e))^2}{f(e)}$ was used to treat research problem number three, specifically problem 3.1, 3.2 and 3.3.

On the other hand, Pearson r $r = \frac{\sum xy - \sum x \sum y}{\sqrt{\left[n\sum x - \left(\sum x\right)^2\right]\left[n\sum y - \left(\sum y\right)^2\right]}}$ was used to analyze data on research problem 3.4.

The data on research problem 4.1, 4.3 and 4.4 was treated through Kruskal-Walis One-Way Anova, while problem 4.2 was treated through Mann-Whitney U Test.

$$U = n_1 n_2 + \frac{n_2(n_2+1)}{2} - \sum_{i=n_1-1}^{n_2} R_i$$

The aforementioned statistical tools were principally functional in aiding the researchers in the presentation, analysis and interpretation of the data collected and in drawing conclusion on the level of professional competence of radiologic technologist in Davao City on factor selection of X-rays of skull, extremities and chest.

RESULTS

On the profile of the respondents, majority of the radiologic technologist belong to the 21 – 25 years old bracket which is equivalent to 38.1%. There were 5 respondents who belong to the 26-30 bracket. The same goes with the 31-35 bracket which is equivalent to 23.8%. Two respondents belong to 51-55 age group that is 9.5% and only

one respondent fell under the 41-45 age group. Below is the graphical presentation on the age brackets of the respondents.

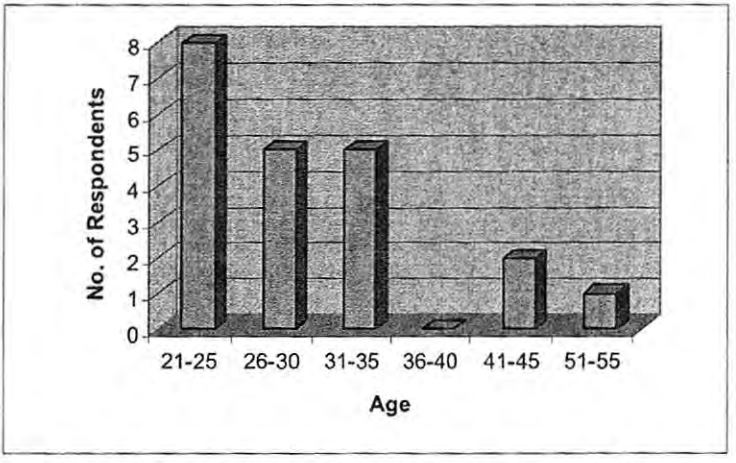

Figure 1. Distribution of Respondents According to Age

About 18 out of 21 respondents, which is equivalent to 85.7%, were BS Radiologic Technology graduates. There were 2 respondents, which is equivalent to 9.5%, who graduated with a degree in Associate Radiologic Technology. Only one respondent had an RT training certificate. A graphical presentation of the mentioned data is presented below.

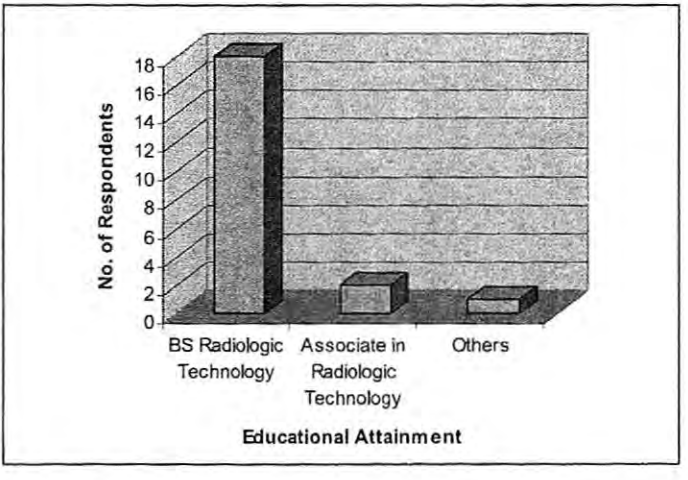

Figure 2. Distribution of Respondents According to Educational Attainment

About 90.5% of the respondents were able to acquire professional training from colleges or universities. The other 2 respondents acquired their professional skills from hospital trainings. A graphical presentation of this data is presented below.

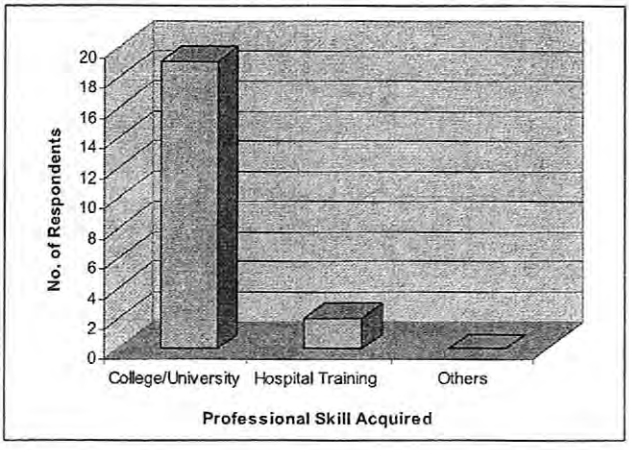

Figure 3. Distribution of Respondents According to Institutions where Professional Skill Acquired

Majority of the respondents are working at institution B with a frequency of 12 which is equivalent to 57.1%. About six of them are working at institution A, equivalent to 28.6% while the remaining three are working at institution C which is equivalent to 14.3%.

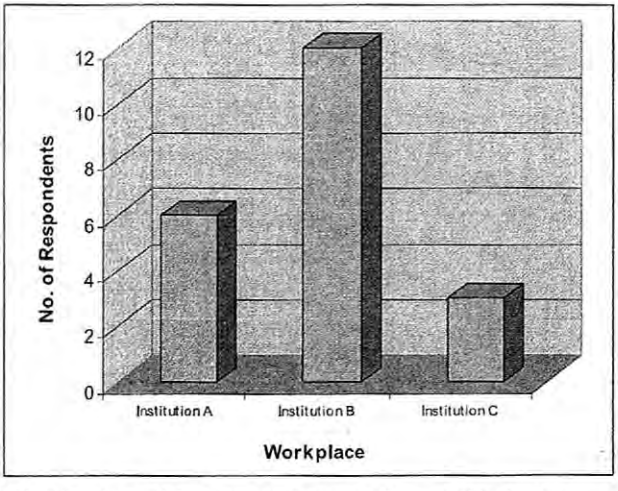

Figure 4. Distribution of Respondents According to Workplace

There were 7 respondents who served 1 – 5 years as Radiologic Technologists which is equivalent to 33.3%. Six of the respondents served for less than a year, which is equivalent to 28.6%. Three of the respondents fell under the 6-10 years category. The

same goes with the 11-15 years category, which is equivalent to 14.3%, respectively. The remaining two respondents, which is equivalent to 9.5%, have been working for 16 years and above.

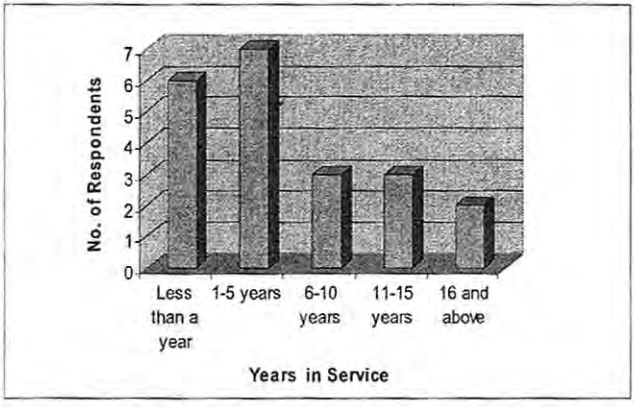

Figure 5. Distribution of Respondents According to Workplace

Table 1. Level of the Respondents' Professional Competence on Factor Selection of X-rays of Skull, Chest and Extremities

Descriptive Statistics:					
	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**Remarks**
Skull	5	10	8.28	1.31	High
Chest	4	9	6.33	1.39	Moderately High
Extremities	4	10	6.28	1.68	Moderately High

As shown in Table 1, among the three x-ray procedures namely, skull, chest and extremities, the respondents were revealed to possess high competency on factor selection of skull examinations. Nevertheless, the respondents still had relatively high competency on factor selection in terms of chest and extremities x-ray procedures.

Table 2. Relationship between Professional Competence on Factor Selection of X-rays and the Profile of the Respondents

Variables		**Chi-Square Value**	**Sig. (P-Value)**	**Remarks**
Professional Competence on Factor Selection Survey	Educational Attainment	25.47	0.011	Significant
	Prof. Skill Acquired	12.29	0.0197	Not Significant
	Workplace	23.04	0.189	Not Significant
	No. of Years in Service	0.62*	0.034	Significant

* Pearson Correlation Coefficient

As shown in Table 2 , respondents' profiles, in terms of respondents' workplace and professional skill acquired, have no significant relationship with their competence on factor selection while their educational attainment and number of years in service remarkably have significant association on the respondents' competence on factor selection.

As shown in Table 3, professional competence on factor selection has significant difference in terms of educational attainment of the respondents

Table 3 Differences on the Professional Competence of Respondents when Grouped According to their Profile

Variables		F-Value	Sig. (P-Value)	Remarks
Professional Competence on Factor Selection Survey	Age	0.662	0.627	Not Significant
	Educational Attainment	22.045	0.016	Significant
	Workplace	0.756	0.484	Not Significant
	No. of Years in Service	0.919	0.477	Not Significant

CONCLUSION

1. Majority of the Radiologic Technologists belong to age group of 21-25 years old, BS Radiologic Technology degree holders, acquired professional skill from colleges and/or Universities, belong to institution B , and rendered 1-5 years in service.
2. The levels of respondents' professional competence on factor selection of x-rays are summarized as follows: skull is very high, chest and extremities are high.
3. The educational attainment and the number of years in service have a significant relationship with the respondents' professional competence on factor selection.
4. There is a significant difference on the professional competence on factor selection in terms of educational attainment of the respondents.

RECOMMENDATIONS

1. Medical institutions shall uphold the continual education of their Radiologic Technologists as they progress in their years of service to equip them further in their field.

2. Radiologic Technology schools should continuously enhance their curriculum and put premium on allowing the students to put the theories learned into practice.
3. Conduct further researches on this subject matter with new variables included.

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