RESEARCH ARTICLE

Evaluation on the knowledge, attitude, and practices toward evidence-based practice in computed tomography among radiographers

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Abstract:

The study aims to identify the level of knowledge, attitude, and practices toward evidence-based practice (EBP) in computed tomography (CT) among radiographers and factors that influence the use of EBP in CT among the radiographers. This is a cross-sectional study to evaluate the knowledge, attitude, and practice toward evidence-based practice in computed tomography among radiographers. The research was done by using a self-administered questionnaire covering socio-demographic features, knowledge on EBP, understanding of specific terms related to EBP, access and availability toward literature, attitudes and practices, and also barriers perceived toward EBP in CT that had been distributed to 30 radiographers in Hospital Muar. All the data obtained were analyzed using SPSS software version 21. The level of knowledge toward EBP in CT among radiographers was high, where 63.3% of the respondents had high knowledge, and only 36.7% of the respondents had a low level of knowledge toward EBP in CT. The radiographer also had a high level of attitude and practices by 56.7%, and 43.3% of the respondents had a low level of attitude and practices toward EBP in CT. The barriers that affect the implementation of EBP among radiographers involve in CT was the inability to critically appraise literature. The lack of information resources and insufficient time also become the most factors that influence the use of EBP in CT. In conclusion, from the findings, most of the radiographers had high a level of knowledge, attitude, and practices toward evidence-based practice in CT and understood most of the specific terms related to EBP.

Keywords: Attitude, computed tomography, evidence-based practice, knowledge, practices

1. INTRODUCTION

Evidence-based practice (EBP) is an approach that organizes, which can be used in clinical decision-making that involves the best current evidence accessible from research and clinical skill [16]. It becomes a wide-reaching concern for numerous professional bodies and is considered as a basis for health care quality. As stated by Eid AbuRuz et al. [5], EBP serves as a method to solve the problems based on research evidence while considering the patient's values and clinical experience. In radiology, there are rapidly increasing technological advancements that need the radiographer to provide service using currently available research evidence to get the best decision that benefits the patients and prevent harm [14].

Computed Tomography (CT) has been known as the revolutionary diagnostic imaging tool since its introduction. It produces sectional digital imaging techniques that produce images different from the conventional radiographic technique in several aspects. The images produce referred to as transaxial images because it refers to planar sections that perpendicular to the long axis of the patient. CT uses a computer to collect, process, and reconstruct the data transmission from the patients' body. It helps to produce the images by eliminating the superimposition structures, improves image contrast, and detects difference tissue contrast less than 10% [15].

Computed Tomography is widely used and become a reference standard for some emergency diagnosis. The rise in the use of CT has its effect as the ionizing radiation from CT scans is associated with an increased risk of subsequent malignancies. This is important to appropriately identified injured patient who really need the CT scan and who does not need. A study conducted by Halaweish et al. [10] on the patient with head and abdominal trauma. The result shows that there is a decreased number of patients need to undergo CT after the evidence-based guideline is used. This help to reduce the number of patients being exposed to unnecessary radiation. With respect to population health, a sensitive clinical decision is used that can greatly reduce unnecessary risks and costs. Evidence-based practice is constructed to reduce those potential harms that occurred in CT. It helps to prevent overdiagnosis and overtreatment as identifying incidental findings or other findings of unknown clinical

significance [13]. This will result in costly follow-up procedures that lead to additional radiation and potential morbidity from invasive testing.

Computed Tomography has shown its progressive year by year technological advances, thus increase the widespread uptake of CT in clinical practice. Evidence-based practice understanding, interpretation, and application of the best current evidence into radiology practice that optimizes patient care. Lavelle et al. [12] also stated that the evidence-based practice (EBP) is widely accepted as a standard that supports robust decision making. Radiographers indeed generate and consequently use evidence in their daily service delivery, but most of them are not routinely using EBP. In radiography, actively pursuing new evidence within the fields can decrease the possibility of clinical practice become out of date and be able to provide high-quality services for health care users [9].

2. MATERIALS AND METHODS

2.1 Study Design

This is a cross-sectional study design to evaluate the knowledge, attitude, and practices of radiographers toward EBP in CT. A survey questionnaire will be given to 30 diagnostic radiographers working in Hospital Pakar Sultanah Fatimah, Muar Johor, who agree to take part in this study. The questionnaire was adapted from the article by Antwi WK [1] and C. Costa et al. [3]. A pilot was conducted among 15 radiographers that involve in CT to gather information about the study's validity and reliability of the questionnaire. Half of the sample size was chosen to undergo the pilot study. A set of the questionnaire has been given to the radiographer working there by google form.

2.2 Data Collection

The questionnaire designed was divided into two parts. The first part consists of a demographic variable on radiographers' age, gender, qualification, and years of working and involve in CT. The second part includes 29 items that can be divided into four sections, which is to access the knowledge level of a radiographer, their understanding of specific terms related to EBP, attitudes and practices, and also barriers perceived toward EBP in CT.

In this study, 5 Likert-scale will be used with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree for answers. For each of the response items, the response of "3 and above" is considered to be high knowledge, attitude and practice toward EBP while "less than 3" were considered to have low knowledge, attitude, and practice. Several items related to access and availability toward literature and to understand specific terms related to EBP required categorical response ('YES/NO'). A score of 1 was given for each yes that indicate correct or 'I know' answer and for no that indicates incorrect answer or 'I don't know' answer was scored with zero.

2.3 Data Analysis

All data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 21. Descriptive analysis for all data such as demographics, knowledge, attitude and practices, and scores from the barrier's questionnaires. The data were then analyzed using descriptive statistics. For evaluation of the differences between radiographer's level of knowledge, attitude and practices toward EBP in CT based on their years working in CT and qualification of study, the ANOVA test was used. Post-hoc Anova test was carried out to determine the differences between radiographer's number of years working in CT and the level of their knowledge toward EBP in CT if there is a differences.

3. RESULTS AND DISCUSSION

3.1 Demographic Data Analysis

Table 1: Data of Socio-demographic of participants

Demographic Data		Frequency	Percentage (%)
Gender	Male	12	40.0
	Female	17	56.7
Age	20-29	20	66.7
	30-39	7	23.3
	40-49	3	10.0
	>50	0	0
Years of Working	<5 years	13	43.3
	5-10 years	12	40.0
	11-15 years	2	6.7
	>15 years	3	10.0
Duration with CT Scan	<6 months	12	40.0
	1-5 years	11	36.7
	6-10 years	3	10.0
	>10 years	4	13.3
Entry Level Qualification	Diploma	22	73.3
	First Degree	8	26.7
	Master	0	0
	PhD	0	0

Table 1 shows the demographic data of the respondents. The total number of female radiographers (56.7%) was more than the number of male radiographers (40.0%). Most of the respondents, 20 (66.7%) were aged 20-29 years old, and only 3 (10%) were aged 40-49 years old. Most of the radiographers have been working as radiographers at the hospital for less than five years and between 5-10 years with 43.3% and 40.0%, respectively. Most of the respondents, 22 (73.3%) were from diploma level qualification, with most of them involved in CT scan for less than six months (40%) and between 1-5 years (36.7%).

3.2 Knowledge toward EBP in CT

Figure 1 shows the respondent's knowledge of EBP in CT. Most of the respondents agree (43.3%) and strongly agree (43.3%) that they learned the foundation of EBP, and only 1 (3.3%) stated for strongly disagree. This can be considered most of the participants have at least some knowledge regarding the EBP. Half (50%) of the respondents agree that they involved in training in search strategies, with only 1 (3.3%) strongly disagree in stated that they familiar with medical search engines. This shows that most of the respondents have knowledge of search strategies and familiar with medical search engines. The other studies conducted by Antwi WK et al. [1] among radiographers in Ghana also agreed learned foundation of EBP, but only a few of them had knowledge using medical search engines such as MEDLINE. Most of the respondents strongly agree (36.7%) and agree (33.3%) that they had formal training in critical appraisal, and most of them agree (46.7%) that they were confident in appraisal skills and search skills. The mean for radiographer's knowledge toward EBP in CT is 4.0667. This shows that radiographers have high knowledge of EBP in CT, which is 63.3%. This was support by the previous study done by Nalweyiso et al. [14] toward radiographer, in which the majority of them had high knowledge of EBP.

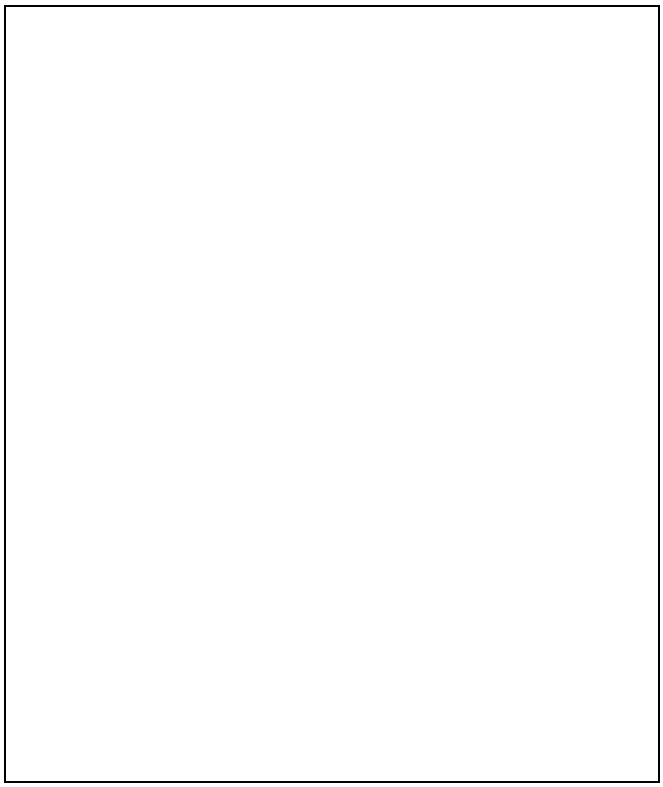

Figure 1: Knowledge toward EBP in CT

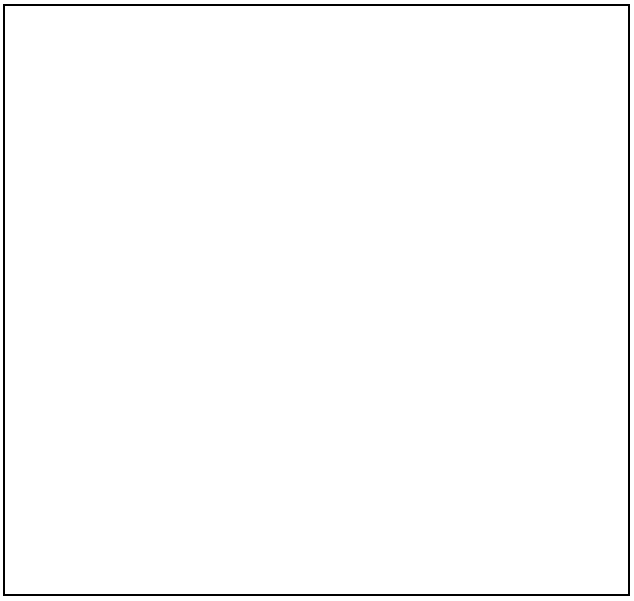

Figure 2: The specific terms regarding EBP in CT

Figure 2 shows that majority of the respondents answer 'YES' to the terms such as relative risk, systematic review, meta-analysis, confidence interval, heterogeneity, and publication bias, which have large differences with respondents that answer 'NO'. This shows that most of the respondents understand most of these terms used. There is only slightly different between the percentage of 'YES' and 'NO' answer for terms such as absolute risk, which 60% knows and 40% didn't know and also odds ratio terms with 56.7% answer 'yes' and 43.3% answer 'no. The study conducted by Guidetti et al. [8] also stated that the research terms with the lowest understanding were odds ratio.

Table 2: Knowledge Level toward EBP in CT

		N	Frequency (%)
Valid	Low	11	36.7
	High	19	63.3
	Total	30	100

Table 2 shows the percentage of the respondent's knowledge level toward EBP in CT. It shows that the percentage of the respondents (63.3%) who have high knowledge toward EBP in CT is greater than the respondents who have low knowledge (36.7%). Based on table 7, the differences between the knowledge level with the duration years working in CT and their entry-level qualification was calculated. From the results, the respondents involved in CT scan were <6 months (40%), 1-5 years (36.7%), 6-10 years (10%), and >10 years (13.3%). The mean score for respondents involves less than six months was 4.4167, 1-5 years were 3.6667, 6-10 years were 3.5000, and more than ten years were 4.5417. Based on ANOVA, there is a difference between the knowledge level and their years working in CT scan as the p values are 0.006, which is less than (p value> 0.05). After the post-hoc test was done, there are only differences between radiographers working less than six months and 1-5 years as the p-value less than 0.05 while the other combination has no differences. There are also no differences between entry-level qualification and their knowledge level as the p-value is 0.369.

3.3 Attitude and Practices toward EBP in CT

The findings of this study were that the respondents have a good attitude and practices toward EBP in CT. Figure 3 shows the attitude and practice of respondents toward EBP in CT. Most of the respondents agreed (40%) and strongly agreed (40%) that EBP is essential for improving the quality of services and practices in CT. This also supported by the previous study by Elshami et al. [6], in which 99% of respondents agreed that EBP important as it improves practices and ensures better patient care. Only 1 (3.3%) disagrees and strongly disagrees that EBP contributes to the improvement of the decision making about technical and other practices in CT. This shows that most of the respondents accept the use of EBP in clinical practice CT. The respondents agree (n=16) that EBP promotes the participation of the patient, and only 2 (6.7%) strongly disagree that EBP reinforces the guarantee of patient safety. Most of the respondents agree that EBP promotes the confidence of the users and scientific reading and research results contribute to enhancing the effectiveness and efficiency of the procedures with 63.3% and 56.7%, respectively. This can be concluded that radiographers used the EBP in their clinical practice as it improves their procedures involving CT.

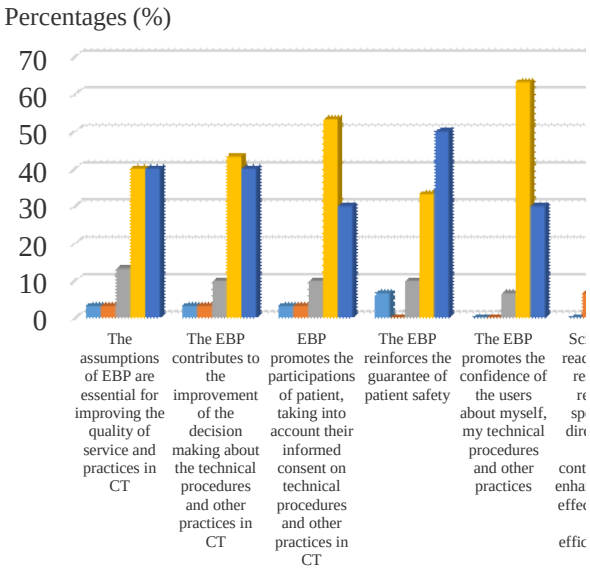

Figure 3: Attitudes and Practices toward EBP in CT

Table 3 shows the attitudes and practices level of the respondents toward EBP in CT. It shows that most of the respondents (56.7%) have high attitudes and practices toward EBP in CT, and 13 (43.3%) of them have low attitudes and practices. One-way ANOVA test had done to determine the differences between the duration working in CT and qualification level with their attitudes and practices toward EBP in CT and the results show that there are no differences between the duration working in CT scan and qualification level with their attitudes and practices as the p-value are 0.691 and 0.230 respectively. Therefore, they were excluded for the next step of analysis (post-hoc). This is supported by the study done by Eid AbuRuz et al. [5] that years of experience do not have a correlation with their attitudes and practices toward EBP.

Table 3: Attitudes and Practices Level toward EBP in CT

		N	Frequency (%)
Valid	Low	13	43.3
	High	17	56.7
	Total	30	100

3.2 Barriers toward implementation of EBP in CT

Table 4: Mean Barriers of EBP in CT

Barriers	Mean	Std. Deviation
I don't have insufficient time	3.47	0.819
Lack of information resources	3.40	0.968
Lack of research skills	3.33	0.959
Inability to critically appraise literature	3.60	0.855
Lack of generalization of research findings	3.33	0.758
Inapplicability of research findings to individual patients	3.30	0.750
Lack of understanding of statistical analysis	3.20	1.031
Lack of collective support among colleagues	3.07	0.944
Lack of interest	3.13	0.973

Table 4 shows the mean of the barriers perceived toward implementation of EBP in clinical practice of CT. The result shows that the three highest mean values, which are 3.60 for inability to critically appraise literature, 3.47 for insufficient time and 3.40 for the lack of information resources. This also support by the previous study by C. Costa and A. F. Abrantes [3], which majority of the radiographer agreed that knowledge to transfer the result of literature to their daily practice is one of the barriers in implementing the EBP in CT. Another study done by Antwi WK et al. [1] and Guidetti et al. [8] stated that lack of time had been shown to be one of the major barriers to the use of evidence in practice while lacking information resources as the second major barriers. As stated by Antwi WK et al. [1], the time to answer the clinical questions, selects an effective search strategy, finding a source cover the topic under questions and synthesizing multiple information to formulate an answerable question was the steps involve when using evidence-based as practice.

Then, the other barriers that affect the use of EBP in CT among radiographers are lack of research skills and lack of generalization of research findings with mean 3.33. This shows that radiographers are lack skills in finding the information related to research. The same findings show in the previous study conducted by Chukwuani et al. [4], which stated that access to research data is perceived as barriers by nearly half of the respondents.

Table 5: Differences between demographic variable and knowledge, attitude and practice level toward EBP in CT

	ANOVA (p-value.)	
	Knowledge Level	Attitudes and Practices Level
Duration with CT Scan	0.006	0.691
Entry Level Qualification	0.369	0.230

4. CONCLUSION

In conclusion, from the results of the study, most of the radiographers agreed and have high knowledge regarding the EBP in CT by 63.3% (n=19), and most of them understand most of the specific terms related to EBP. Then, 56.7% of the radiographers have a high level and positive attitudes and practices toward EBP in CT. Inability to critically appraisal literature, insufficient time and lack of information resources are identified to be the main barriers that affect the use of EBP in CT. Therefore, effort from everyone to advance the use of EBP in CT should focus on decreasing these barriers. Lastly, there is a difference between the duration working with CT and their knowledge level toward EBP in CT but no differences with their attitudes and practices. There are also no differences between the entry-level qualification and both their knowledge, attitudes, and practices toward EBP in CT as there is no significant.

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