

Perception of radiographers on performing intravenous contrast media administration

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Abstract

The advancement of imaging modalities increase the number of examination and lead to the market demand of radiographers. College of Radiography has outlined a developmental framework to perform intravenous (IV) injection in the code of professional conduct in which radiographers are encouraged to develop their professional roles. The role advancement will benefit radiographers in terms of enhancing personal fulfillment, job satisfaction and career. Thus, this study was conducted to assess the perception of radiographers on performing intravenous injection of contrast media. This cross-sectional study which used simple random sampling was conducted around 18 private hospitals in Peninsular Malaysia, involving 110 respondents with length of experience of more than one year. A total of 63.6% are willing to perform venipuncture injection if appropriate training is given. Independent chi-square test yielded significance in relationship between the educational level and willingness of radiographer to perform venipuncture ($p > 0.05$). Majority are willing to take this extra task as their responsibility since they believed that it would improve the departmental flow and reduce patients waiting time. As a conclusion, a special training may be proposed before giving the task to them to improve their medico-legal protection.

Keywords: intravenous injection, contrast media, radiographers

1. Introduction

According to New Oxford American Dictionary, extend is to stretch something in order to make it bigger ^[1]. The role extension for an allied health practitioner involves carrying out any tasks that are not included in official job scope. In radiology department, role extension has been impacted upon by the broadening the boundaries of role required in diagnosis ^[2]. Radiography field is developing and changing dramatically by technology advances and through the demand for change by personal shortages ^[3]. There is no doubt that role development within the radiography profession has been undergoing tremendous change over the years. For radiographers, the increasing diversity of imaging examination and associated imaging technologies has resulted in many radiographers being required to extend their individual scope of practice to include competency in advanced imaging modalities such as Computed Tomography, Bone Densitometry and Angiography ^[4]. As a result, role extension is often dictated to the need and demands of the employing organization or department as a method of optimizing service delivery by maximizing the flexibility of the staff's work scope. Internationally, radiographers are taking on responsibilities which were previously within the domain of radiologist.

According to White (2004), evidence from clinical practice usually offers a thin line between the extended and advanced role ^[5]. Consequently, working at an advanced level implies greater accountability, responsibility and autonomy for broader aspects of service management and patient care underpinned by high level of knowledge and skill developed through role extension within a chosen practice specialty. The need to develop this role was supported by various factors which included the increasing short of radiologists, growing demand for radiographic procedures as well as desires to enhance the overall quality of patient care.

Due to the several factors that need the radiographer to extend their role, thus, United Kingdom (UK) added an extra task for their radiographers performing IV injection. Increasingly, radiographers are taking greater responsibility previously from radiologist where they are required to perform IV injection contrast media ^[6].

The College of Radiographer (CoR) has outlined a developmental framework performing IV injection in the code of professional conduct in which radiographers are encouraged to develop their professional roles ^[7]. It means that existing roles must be re-evaluated and present skills must be fully utilized and further developed and this chance demands high levels of training, expertise and experience, all of which may provide enhanced job satisfaction and increased motivation ^[6]. Importantly, it has been acknowledged that radiographers' skills have not been fully utilized. The Australian Institutes of Radiography stated in its guidance notes for radiographers in 2007, that radiographers may be involved in the provision of limited venipuncture in radiography and provide guidelines for the conduct of this procedure. More importantly, the framework described could be transposed to other existing or future areas of role development. The role advancement will benefit radiographers to greatly enhance personal fulfillment, job satisfaction and prestige which can in turn lead to increased motivation and career enhancement. Within a validated system of delegation, utilization of radiographers' skills in an expanded role improves allocation of resources and may increase motivation and provide career enhancement amongst radiographers.

The opportunities for further development of the profession are explored along with an overview of some of the possible barriers to progress. This study's contention is that radiographers are more than adequately prepared for a rapidly changing future. To ensure that they are prepared, therefore, it

is essential for the profession to adopt an appropriate vision, formulate an achievable strategy, and promote a culture of professional practice which is able to respond adequately to the problems facing its continued existence. Thus, this study was conducted to achieve these objectives:

- 1) To determine the perception of radiographers have towards the medico-legal aspect of intravenous contrast media administration by radiographers.
- 2) To determine the perception of radiographers to possible changes in their work flow and responsibility by performing venipuncture injections before particular examinations.
- 3) To determine if the work place influence the radiographers' perception regarding the administration of intravenous contrast media
- 4) To determine the relationship of radiographers' educational level with their willingness to perform venipuncture

2. Materials and Methods

This cross sectional study was conducted throughout 18 private hospitals in Peninsular Malaysia which should involve 110 respondents [8]. Simple random sampling was used during data collection process. The data collection process took 4 months to complete, where respondents are radiographers with minimal working experience of one year.

The study used a set of questionnaire distributed by postage and face-to-face interaction. The questionnaire consists of demographic data in Section A, 13 close-ended questions in Section B and 1 open-ended questions in Section C. The questions in section B are on departmental workflow, training, and medico legal aspects while Section C asked on the opinion of respondents on performing venipuncture.

The data were analyzed using Statistical Package for Social Sciences (SPSS version 22.0). Objective (i), (ii), and (iii) were answered by using descriptive analysis while the objective (iv) was analyzed using chi square test.

3. Result

Sixty-eight percent 68.2% of 110 respondents were female (Figure 1) and majority of the respondents within 25 to 40 years (Figure 2). More than half of respondents have working experience of more than 5 years (Figure 3) and majority of the respondents are Diploma holders (81.8%, Figure 4).

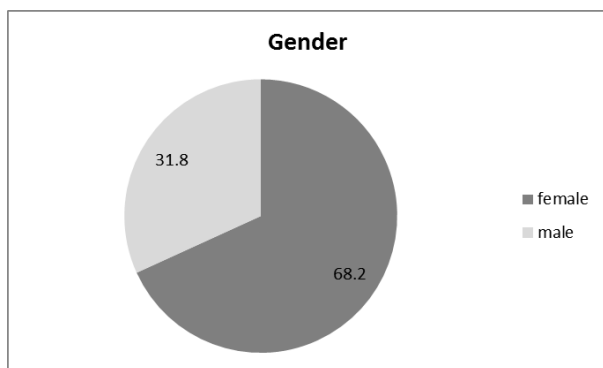


Fig 1: Gender

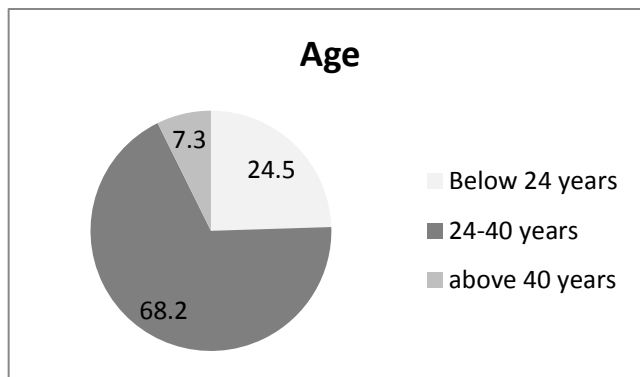


Fig 2: Age of respondents

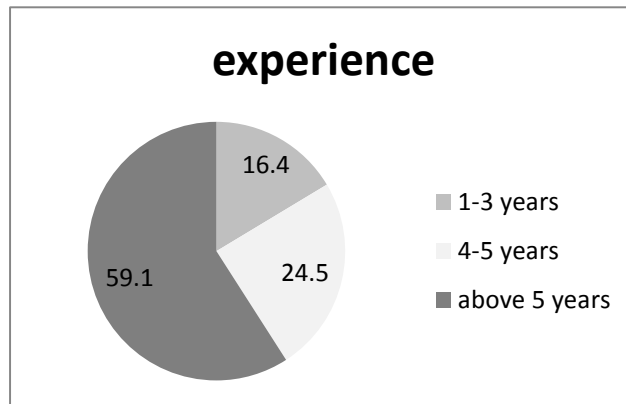


Fig 3: Working experience

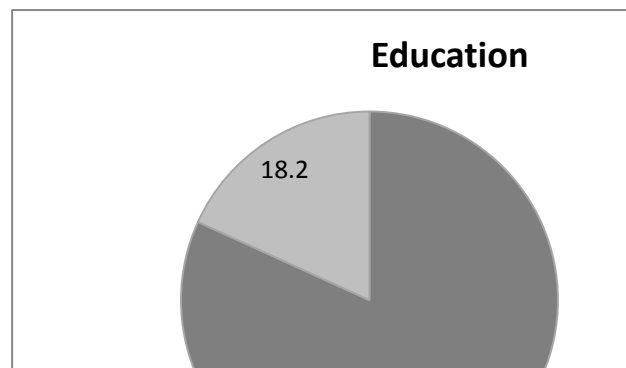


Fig 4: Education level

Figure 5 shows that the feedback from respondents regarding medico-legal perception. Forty-seven percent (47.3%) of respondents disagreed that the venipuncture injections should only be done by doctors or nurses (Question 4); while 39.1% disagreed that venipuncture injection by radiographers still cannot help lessen the busy duties of radiologist or nurses (Question 6). Half of respondents (50.9%) disagreed that medico-legal protection for radiographer undertaking contrast media injection was sufficient (Question 11). A total of 45.5% agreed that most of them need a training course of contrast media injection (Question 12).

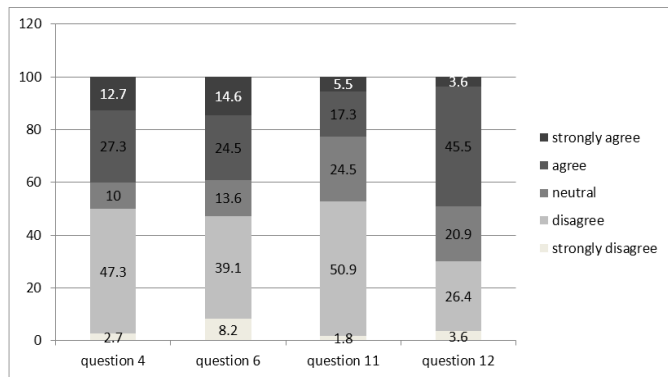


Fig 5: Perception of radiographers towards the medico-legal aspect of intravenous contrast media

Figure 6 shows the summary of the respondents’ feedback on their perceptions to possible changes of their workflow and responsibility on performing venipuncture injection. More than half (64.5%) of respondents agreed that venipuncture by radiographers can improve departmental flow (Question 3) and for Question 5, and a total of 54.6% believes that radiologists and nurses can save their time as allowing radiographers to perform venipuncture. More than half (60.9%) of respondents assured that venipuncture by radiographers cannot negatively affect the routine management and work flow (Question 8); and also more than half (59.1%) of respondents were certain that venipuncture injection by radiographers are able to let radiologists or nurses to perform other duties.

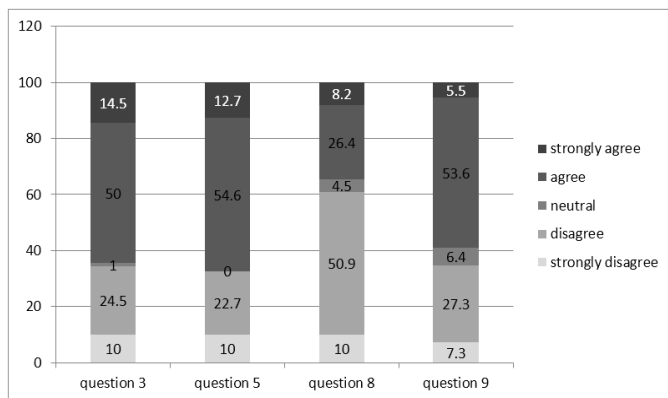


Fig 6: Perception of radiographers to possible changes in their work flow and responsibility on performing venipuncture injection

The final category of the questionnaire demonstrated in Figure 7 was regarding the administration of intravenous contrast media. A total of 67.3% and 66.3% agreed that venipuncture injections should be a part of radiographers’ normal duty (Question 1) and it may develop job satisfaction (Question 7), respectively. Sixty-nine percent (69.1%) disagreed that venipuncture injection by radiographers will waste their time to perform other imaging duties (Question 2) and 67.3% disagreed that venipuncture may put unnecessary pressure due to the added responsibility.

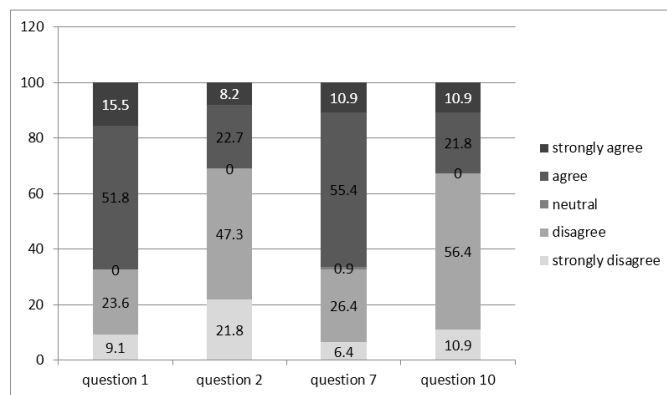


Fig 7: Work place, influences the radiographers perception regarding the administration of intravenous contrast media

More than half of respondents (63.6%) were willing to perform venipuncture injection if an appropriate training is given. Independent chi-square test yielded significance in relationship between the educational level and willingness of radiographer to perform venipuncture (p=0.78). The present study found that 50% and 65.5% of respondents who are willing to perform venipuncture are from bachelor and diploma holder respectively.

4. Discussion

The study findings were found to be consistent with Toh *et al.* (2007) that reported more than half respondents in accord of accepting the added task of performing venipuncture injection if given appropriate training [9].

4.1 The Perception of Radiographers on Medico-legal Aspect of Contrast Venipuncture by Radiographers

In total, 52.7% of respondents disagree and strongly disagree that medico-legal protection for radiographer undertaking contrast media injection was sufficient. This result was not consistent with that in Toh *et al.* (2007) in which the respondents thought they have adequate medico-legal protection [9]. Of total respondents, 24.5% were uncertain whether radiographers were protected under the policy or not. This might be due to limited short courses in medical law in which suits the role and practice of radiographers. In UK model’s New South Wales Health Department, radiologist must supervise contrast injection by radiographers and therefore is responsible for any untoward outcomes and care for any reactions [10]. Besides that, healthcare practitioners ought to report violations and seek amendments in circumstances where they have good reason to believe that patients’ right are being violated [11].

However, nearly half of respondents thought that venipuncture should not only be done by doctors or nurses. This result was not in a consensus with Toh *et al.* (2007), in which his respondents stated that venipuncture is not their job and should only be done by doctors and nurses since they were specifically trained to perform IV injection [9]. One of the respondents commented that radiographers does not received a completed training and it would be a problem should there be any accidents to the patient. A total of 49.1% responded that they would appreciate if a training course of venipuncture is given. According to Munro (2012), 62% of radiographers thought that they could take full responsibility

in contrast media reaction and resuscitation ^[12]. Based on these two questions (Question 4 and Question 12), it proves that respondents were interested to perform venipuncture, however they do not want to take any risks of the untoward outcomes.

About half of respondents oppose the statement that venipuncture procedure done by radiographers cannot help lessen the duties of radiologist or nurses. Since this study was conducted in urban area, therefore, number of patient per year is quite high. Radiologists and nurses have very high workload. Hence, radiographers' help in performing venipuncture contrast media injection is needed. Indirectly, radiographers could help radiologists to improve the departmental workflow.

4.2 The Reactions of Radiographers towards the Possible Changes on Their Workflow and Responsibility on Performing Venipuncture

A total of 64.5% were in favor that venipuncture by radiographers can improve departmental workflow. Toh *et al.* (2007) supported this result by 88.9% of their respondents agree that it could improve departmental workflow ^[9]. One of respondents commented that a smooth workflow is very important in order to gain patients' satisfaction. A total of 54.6% believe that radiologists and nurses can save their time as allowing radiographers to perform venipuncture. According to Munro (2012), service delivery to patients would be more brief if radiographers are allowed to perform venipuncture, and therefore increasing job satisfaction ^[12]. Besides that, a respondent remarked that radiographers need to know the method of venipuncture because it helps in reducing patient waiting time and improving patients' satisfaction. This proves that not only the time for radiologists and nurses can be saved but also the patients'. Interestingly, Toh *et al.* (2007) found that radiographers' time would also be saved as they were no longer count on doctors and nurses to perform the injection ^[9]. This result is also supported by Munro *et al.* (2012) when they found that 93% of their respondents assumed the benefit of venipuncture would fasten the service delivery to patients ^[12].

Half of respondents assured that venipuncture by radiographers cannot negatively affect the normal management and workflow. Besides that, half of respondents were certain that venipuncture by radiographer enables the radiologist or nurses to perform other duties and this result was supported by previous study ^[9, 12].

4.3 Work place, influences the radiographers perception regarding the administration of intravenous contrast media

About half of respondents in this study grant that venipuncture should be a part of radiographers' normal duty and also thought that it may develop job satisfaction. This study was in agreement with Toh *et al.* (2007) which majority of their respondents agreed that injection should be a part of routine duties of radiographers and it would improve departmental workflow ^[9]. A respondent of this study claimed that, job satisfaction would increase as the sense of responsibility and independence was increase. The respondents are very keen to perform venipunctural procedures because it could intensify their skill and knowledge. They thought that this is an opportunity for them

to enhance their capability, ability and take it as a positive challenge. Since the radiographers are only allowed to handle modalities where most hospitals use automatic exposure control, the radiographers are seen as too dependable on radiologists and nurses and lack of side skills. Thus, introducing to performance of venipuncture by radiographers would be able to upgrade them in terms of width and depth of skills and knowledge.

More than half respondents in the present study denied that venipuncture by radiographers will waste their time to perform other imaging duties. They also object that venipuncture may put unnecessary pressure due to the added responsibilities. This result was supported by a previous study in which that venipuncture was thought could save patients' waiting time for the nurse or doctors to come to perform the injection ^[9]. A respondent suggested that radiographers also need to know how to do the injection because it helps in reducing patient waiting time. A previous study claimed that it is multi-skilling for radiographers, thus they can save their waiting time, along with patients', in case of unavailability of radiologists or nurses ^[9].

4.4 The Willingness Performing Venipuncture Vs Education Level

Chi-square analysis showed that there is no significant difference between education background and the willingness of radiographers to perform venipuncture. The descriptive analysis showed that diploma holders are keen to perform venipuncture injection compared to the bachelor holder. There are many possibilities of why diploma holders are reacting positively. One of the reasons is might be due to big gap of participant number of participants between bachelor and diploma holders, which are 18.2% and 81.8% respectively. This is because majority of Malaysian radiographers enter the clinical field with a diploma qualification whereas, majority of degree holder gets involved in management site. According to Skim Perkhidamatan Awam the job description of radiographer with degree qualification including clinical function, quality assurance and quality control, management function, provide training to the new radiographer and doing research ^[13].

5. Limitation and recommendation

As this study found that there is no significant difference between the willingness to perform venipuncture and the educational background, then this might be due to some limitations that the researchers were not expect to happen. This study was conducted in private hospitals only. Private hospitals have less number of patients and healthcare giver in radiology department as compared to the government hospitals. Therefore, in terms of the number of patients coming to the department daily, private sector is outnumbered by those of government hospitals. A further study would be better investigating both private and government sector hospitals for comparison analysis.

The College of Radiographers is providing a certificate of competence in administering intravenous injection ^[7]. Training course for radiographers on the IV injection is necessary and it must come with drug administration for the reaction treatment ^[12]. This study also found that more than half of respondents are willing to perform intravenous only if training is given and also concerned about the medico-legal.

Therefore, planning for certificate training is highly recommended. By providing certificate training, radiographers would understand their rights and also the patients' right better.

6. Conclusion

As a conclusion, majority of respondents are willing to perform intravenous injection as they believed it would give an edge over the lack. The benefits including improve their skills and knowledge, job satisfaction and professional development. Besides that, the most significant effect that can be seen later is departmental workflow would be more effective as the patients will no longer have to wait for doctors or nurses whenever they are not available to perform the injection. However, the issues of patients' right need to be considered. Since radiographers were not exposed to the intravenous injection previously, therefore, short course training related to the intravenous injection as well as medico-legal is needed.

7. References

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