Radiography students’ satisfaction during their practical and clinical training sessions at King Khalid University, Saudi Arabia: A cross-sectional study.

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Abstract

Academic and professional work integrated learning is an integral part of tertiary education around the world. This article arises from a research project evaluating radiography students’ satisfaction during their practical and clinical training sessions. The major aim of this study was to determine the extent at which perceived academic and organizational support influences the commitment of radiographers to their learning in practical and clinical hospital settings. 162 students from various levels (junior and senior) were evaluated on the questionnaire for their satisfaction in radiography practical sessions at the university level and clinical training in hospitals. A positive relationship was found between practical and clinical training sessions. Our data strongly suggest that the current management strategies in education play an important role in creating positive learning and potential working environment for radiographers to perform their tasks.

Keywords: King Khalid University, Radiography students.

Introduction

Medical imaging or radiological technology profession has an important role in the health care system. To become a medical imaging professional there are various degrees are available from diploma to doctoral level. The most common basic level of education is the bachelor level, which is typically four years program. In these four years the student will have three years of classroom teaching at university and one year of internship in hospitals. During the bachelor program the students need to study university courses, college specific courses and core radiology courses [1]. To provide the hands on experience, in the second year onwards the radiography students will be exposed to practical sessions with related equipment in their university under the supervision of teaching faculties and clinical trainings in hospitals under the guidance of medical imaging specialists. This type of hands on experience is very crucial for the students to gain the confidence required to handle the practical situations after their graduation [1,2].

Current educational systems are focusing on an important concept called student satisfaction. By knowing satisfaction levels of the students towards their education and learning many transformations can be achieved, which will further improve their capacity of understanding and learning. The majority of the top ranked universities have a system of obtaining student satisfaction surveys after the completion of the program. These surveys are majorly targeting the overall experience of the students in the whole program rather than pinpointing accurate problems facing students in each level. Therefore, the new educational trends are aiming to identifying the issues in each level and in various contexts like classroom teaching, practical sessions and clinical postings [3-6] in this study, we intended to obtain radiography students’ satisfaction in their practice sessions at university and in the clinical training sessions at the hospitals.
Methodology

Institutional research board approval was obtained before the initiation of the study. Total 162 students in five levels (semesters) of the Radiology program at the King Khalid University had participated in this study. In this cross sectional study we designed the questionnaire to evaluate the student satisfaction during the practical and clinical sessions. The basis for this medical imaging students’ questionnaire was previously published [7]. The questionnaire was divided into two parts; Part A contained the demographic data while part B involved information related to student’s satisfaction. Part B was divided into two sections; section one assessing the satisfaction of practical sessions in the University and section two assessing the satisfaction of clinical session in the hospital. Details of the questionnaire are provided in Appendix-1 [8].

Table 1: Level-wise Comparison of Satisfaction from practical session, clinical posting and overall satisfaction

<table>
<thead>
<tr>
<th>Level and Total students</th>
<th>Satisfaction level from practical session</th>
<th>Satisfaction level from clinical posting</th>
<th>Overall Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3</td>
<td>24</td>
<td>2.83 ± 0.82</td>
<td>2.9 ± 1.00</td>
</tr>
<tr>
<td>Level 4</td>
<td>24</td>
<td>3.36 ± 1.07</td>
<td>2.99 ± 1.21</td>
</tr>
<tr>
<td>Level 6</td>
<td>18</td>
<td>3.18 ± 1.13</td>
<td>3.10 ± 1.14</td>
</tr>
<tr>
<td>Level 7</td>
<td>60</td>
<td>2.99 ± 0.89</td>
<td>3.12 ± 0.93</td>
</tr>
<tr>
<td>Level 8</td>
<td>36</td>
<td>2.96 ± 1.02</td>
<td>2.62 ± 0.92</td>
</tr>
<tr>
<td>Total</td>
<td>162</td>
<td>3.03 ± 0.97</td>
<td>2.97 ± 1.01</td>
</tr>
</tbody>
</table>

After explaining the details of the study to the students and obtaining their voluntarily consent form that was attached to the questioner, Adequate period of time was given and student to give their true opinion. To decrease the psychological pressure and fear, the forms were collected by unknown faculties who are not related to their specialty and they were instructed that no further investigation or discussion will be opened about their opinions. SPSS version 15 was used for data analysis. To check the Normality of data PP and QQ plots were used. Descriptive statistics were performed to find the mean, standard deviations of each question as well as the total scores. Cronbachs alpha was used for reliability testing. The scores of section one and two were compared by unpaired t test. The correlations between the two sections and the correlation between each section to total scores were done using Pearson correlation coefficiency. ANOVA was applied to find the satisfaction differences between all the levels of students. p value less than 0.05 was considered as significantly different.

Results

In this study, we aimed to evaluate the satisfaction of medical imaging students during their practical and clinical sessions. The minimum possible score for each question was one while the maximum was five. The questionnaire reliability which was checked with Cronbachs alpha gave a value of 0.906, indicating excellent reliability. All the total 162 students’ questionnaire mean ± standard deviation was 3.00 ± 0.91 and their practical session satisfaction mean ± standard deviation was 3.03 ± 0.97. All the 162 students clinical session satisfaction mean ± standard deviation was 2.97 ± 1.01. For levels 3, 4, 6, 7 and 8 total questionnaire mean ± standard deviation scores were 2.92 ± 0.85, 3.17 ± 1.06, 3.14 ± 1.12, 3.05 ± 0.83 and 2.79 ± 0.87, respectively. Each level total score, sections score, the 162 students’ total and sections’ score mean ± standard deviation are shown in Table 1. All the students’ practical session sections mean ± standard deviation values for question 1,2,3,4 and 5 were 2.9 ± 1.3, 3.0 ± 1.1, 3.1 ± 1.2, 3.1 ± 1.1 and 3.1 ± 1.1, respectively. All the students’ clinical session sections mean ± standard deviation values for question 1,2,3,4 and 5 were 2.7 ± 1.3, 3.2 ± 1.3, 2.9 ± 1.1, 2.9 ± 1.3 and 2.9 ± 1.2, respectively. Overall and each level student’s individual question mean ± standard deviation values are shown in Table 2.

Table 2: All the students and individual level students’ sections score and individual question score mean ± standard deviation

<table>
<thead>
<tr>
<th>Level</th>
<th>Number of Students</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>24</td>
<td>2.2 ± 1.3</td>
<td>2.9 ± 1.1</td>
<td>2.7 ± 1.1</td>
<td>3.1 ± 1.2</td>
<td>3.1 ± 1.1</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>3.2 ± 1.4</td>
<td>3.3 ± 1.1</td>
<td>3.2 ± 1.2</td>
<td>3.4 ± 1.3</td>
<td>3.5 ± 1.1</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>3.1 ± 1.4</td>
<td>3.2 ± 1.2</td>
<td>3.1 ± 1.1</td>
<td>3.2 ± 1.3</td>
<td>3.1 ± 1.3</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>2.9 ± 1.1</td>
<td>2.9 ± 1.1</td>
<td>3.1 ± 1.1</td>
<td>3.1 ± 1.1</td>
<td>2.9 ± 1.1</td>
</tr>
<tr>
<td>8</td>
<td>36</td>
<td>2.9 ± 1.2</td>
<td>3 ± 1.1</td>
<td>3.1 ± 1.3</td>
<td>2.8 ± 1.2</td>
<td>2.9 ± 1.1</td>
</tr>
<tr>
<td>All Levels</td>
<td>162</td>
<td>2.9 ± 1.3</td>
<td>3 ± 1.1</td>
<td>3.1 ± 1.2</td>
<td>3.1 ± 1.2</td>
<td>3.1 ± 1.1</td>
</tr>
</tbody>
</table>
Comparison between scores of section one (University practical sessions) and section two (Hospital clinical sessions) was performed using unpaired t test (Table 3). The results demonstrate a significant relationship between the two section scores (p value <0.001; Table 3), indicating that the students have almost same kind of satisfaction levels for both practical and clinical sessions.

Table 3: Unpaired t test values for comparison between sections (one University practical sessions) and section two (Hospital clinical sessions).

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical session</td>
<td>162</td>
<td>3.03</td>
<td>0.97</td>
<td>0.076</td>
<td></td>
</tr>
<tr>
<td>Clinical posting</td>
<td>162</td>
<td>2.97</td>
<td>1.01</td>
<td>0.079 &lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: ANOVA results for satisfaction differences between various levels.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Comparison</th>
<th>Sum of Square</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction from Practical Sessions</td>
<td>Between Groups</td>
<td>4.32</td>
<td>1.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>147.73</td>
<td>0.94</td>
<td>1.15</td>
<td>0.335</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>152.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction from Clinical Postings</td>
<td>Between Groups</td>
<td>5.99</td>
<td>1.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>160.87</td>
<td>1.02</td>
<td>1.461</td>
<td>0.217</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>166.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Satisfaction</td>
<td>Between Groups</td>
<td>2.94</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>132.9</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>135.85</td>
<td>0.87</td>
<td>0.484</td>
<td></td>
</tr>
</tbody>
</table>

Correlation between sections one and two scores was performed with Pearson correlation co-efficiency. The obtained correlation r value of 0.7 indicates that there is a positive relationship between both sections. The correlation between sections one and two scores, and the total scores was also done by Pearson correlation co-efficiency. The r values for these two sections relative to total scores were 0.91 and 0.92 respectively. These also indicate that there is a positive correlation between the section scores with the total scores. Variance analysis was used to test the differences between satisfactions of various level students. Our results show that there are no statistical significant differences among the levels with respect to their satisfaction for practical and clinical sessions. The values of ANOVA test are shown in Table 4.

Discussion

Studies related to students’ attitude towards their overall education programs [9,10] or to one specific subject [11] are commonly performed. However, studies aiming to evaluate students experience in their practical and clinical training are rarely conducted. In this work, we have evaluated the satisfaction of radiography students at the King Khalid University in their curriculum practical and clinical training sessions in hospitals. The overall questionnaire mean ± standard deviation for the 162 participants was 3.00 ± 0.91 out of the maximum score of 5. This indicates reasonable positive responses and shows that most of our students are satisfied with their practical and clinical sessions. A systematic previous study in the United Kingdom have shown that exposing students to integrated various types of practical sessions at early stages of their study program plays a critical role in improving student interests towards a socially responsive career [9]. In our radiography study field at the King Khalid University we also tend to apply the same strategy through exposing the students to both curriculum-based practical in the teaching laboratories and training sessions in hospital at early stages of the program.

Usually the studies related to students attitude towards their overall education [10] or attitude towards one specific subjects [11] are common but towards their practical and clinical experience are rarely studied. Our study has this rare specialty to find the student satisfaction in practical and clinical sessions. Importantly, among the overall scores, we have noticed that level 8 shows the least mean ± standard deviation, while level 4 gives the maximum mean ± standard deviation score (Table 1). The lower scores in level 8 may be attributed to lack of students’ confidence in the clinical settings after completion [12]. The results for section one indicate that level 3 has the least mean ± standard deviation, while level 4 gained the maximum mean ± standard deviation score. The lower scores in level 3 may be due to the students’ fresh enrolment in their program and clinical postings.

Comparison between the overall section two scores shows that level 8 scored the least mean ± standard deviation, while level...
7 has the maximum mean ± standard deviation. Least scores in
level 8 may be due to lack of confidence among students in
handling patients independently after completing the training
sessions. A previous study conducted on dental students’
perspective about their clinical education showed lower ratings
for clinical learning opportunities (mean=4.26 on a 6.00 scale).
This was mainly attributed to the students concerns about the
efficiency of dental clinic environment and lack of practicing
opportunity to treat patients independently in training clinics
[13]. However, our current objective manner study showed
very good satisfactory levels among the radiography students
in our university and hospital settings. The questionnaire
developed for our study has shown good reliability. In addition,
the correlations between the two sections are also satisfactory
indicating that the students have similar opinions towards both
practical sessions and clinical trainings. The limitations in this
study include Lack of availability of one level students’ data,
the relatively small number of total participants and the
absence of female students’ data. We recommend conducting
similar studies involving larger number of students from
multicentre. Gender, age and levels of specific attitudes may be
more beneficial to understand the precise students’
perspectives throughout the country of Saudi Arabia, and is
part of our future work.

Conclusion
The results of this study indicate that the radiography students
at the King Khalid University are satisfied with their practical
and in clinical training sessions in hospitals. The questionnaire
used in this work could be utilized as a benchmark standard to
assess student’s satisfactions in radiography programs.

References
1. University of Hartford. College of Education, Nursing and
Health Professions. Radiologic Technology.
2. Fairleigh Dickinson University. The Henry P. Becton
School of Nursing and Allied Health. Academic Programs.
B.S. in Radiology Technology.
3. Gurpinar E, Alimoglu MK, Mamakli S, Aktekin M. Can
learning style predict student satisfaction with different
instruction methods and academic achievement in medical
4. Gurpinar E, Kulac E, Tetik C, Akdogan I, Mamakli S. Do
learning approaches of medical students affect their
satisfaction with problem-based learning? AdvPhysiol Educ
5. Penn State University. Student affairs research and
assessment. The Penn State Student Satisfaction Survey
28th march 2014.
7. Almohiy HM, Davidson R. Evaluating the clinical teaching
of medical imaging students at Curtin University of
Technology, Australia. Biomedical Imaging and
8. Bland JM, Altman DG. Statistics notes: Cronbach’s alpha"
9. Littlewood S, Ypinazar V, Margolis SA, Scherpier A,
Spencer J, Dorman T. Early practical experience and the
social responsiveness of clinical education: systematic
10. Kato TA, Balhara YP, Chawla JM, Tateno M, Kanba S.
Undergraduate medical students’ attitudes towards
psychiatry: an international cross-sectional survey between
Shen Y, Ai H. Comparison of attitudes towards dental
education among dental students in Japan and China. Int
Dent J 2014; 64: 76-82.
12. Chen W, Liao SC, Tsai CH, Huang CC, Lin CC, Tsai CH.
Clinical Skills in Final-year Medical Students: The
Relationship between Self-reported Confidence and Direct
Observation by Faculty or Residents. Ann Acad Med
Singapore 2008; 37:3-8
13. Henzi D, Davis E, Jasinevicius R, Hendricson W. North
American dental students’ perspectives about their clinical

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