Examing Diagnostic Radiology Residency Case Volumes from a Canadian Perspective: A Marker of Resident Knowledge

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Introduction

• New guidelines from the Accreditation Council for Graduate Medical Education (ACGME) have proposed minimum case volumes to be obtained during residency but there are currently no minimum case volumes standards for radiology residency training in Canada.

• Having a set of prognostic markers that will help predict resident success will be important in the new Canadian radiology residency curriculum. Close and frequent tracking of resident performance will also be required.

• This new curriculum has come in the form of competency-based medical education (CBME) throughout Canada. At Queen’s University, we were the first Canadian program to transition to a CBME model, and with it, more quantitative measures of resident achievement are needed to assess resident success.

• Thus this study investigated radiology resident case volumes among recently graduated cohorts of residents and determined if there is a correlation between case volumes and measures of resident success.

• We hypothesized that larger case volume would correlate positively with increased success as measured by subjective assessments.

Results

Descriptive statistics

• Table 1 shows that the average number of cases performed by the residents was 7459 with a considerable amount of variability (SD = 824.2).

• The mean percentile score on the ACR in training exam was 53.4 with a standard deviation of 30.5 (See Table 1).

Table 1: Descriptive statistics of all variables used in the analysis
<table>
<thead>
<tr>
<th>Mean</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>7459.33</td>
<td>824.22</td>
<td>6468.00</td>
</tr>
<tr>
<td>Knowledge ranking</td>
<td>5.00</td>
<td>2.75</td>
<td>1.00</td>
</tr>
<tr>
<td>Percentile scores</td>
<td>53.44</td>
<td>20.51</td>
<td>5.00</td>
</tr>
</tbody>
</table>

• No. of deficient categories achieved per ACGME | -2.98 | 5.00 | -5.00 | -1.00 |

Note: Negative values refer to the amount of deficient categories per ACGME minimum standards.

Correlation Analysis

• Results from the correlational analysis shown in Table 2 reveals a strong positive and statistically significant correlation between the total number of cases performed by a resident and their relative knowledge ranking (r = 0.682, p < 0.05).

• As Figure 1 shows, the majority of the observations are clustered around the line of best fit, confirming the observed strong relationship.

• There was a non-significant and weak positive correlation between the total number of cases performed by a resident and their ACR in-training percentile score (r = 0.138, p > 0.05). See Table 2.

• There was a strong and statistically significant positive correlation between residents’ relative knowledge ranking and ACR in-training percentile score (r = 0.715, p < 0.05). This finding is clearly depicted and confirmed in Figure 2 where nearly all the observed values are closer to the line of best fit.

• Results from Table 2, however, suggests that decreasing the number of deficient categories achieved by residents per ACGME guidelines was not significantly correlated with any other variable of interest, despite its moderate to strong positive associations with residents’ knowledge ranking (r = 0.536, p > 0.05) and number of cases performed (r = 0.622, p > 0.05).

Conclusions

• This study reveals that residents who interpret more cases are more likely to demonstrate higher knowledge. This highlights the utility of case volumes as a prognostic marker of resident success.

• The results also underscore the potential use of ACGME minimum case volumes as a prognostic marker. These findings can inform future curriculum planning and development in radiology residency training programs.