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# Public Awareness of Medical Imaging as a Source of Ionizing Radiation Exposure

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## Background

- Ionizing radiation is known to have numerous malefic effects<sup>1</sup>
- In the US, 2006 data demonstrated that approximately half of all exposure to ionizing radiation came from medical imaging<sup>2</sup>
- Patients, physicians, and other caregivers frequently lack a proficient understanding of the risks associated with ionizing radiation<sup>3,4,5,6,7</sup>
- **Objectives:**
  - Assess the extent to which productive, informed conversations regarding ionizing radiation are occurring between patients and providers
  - Characterize the public's awareness of medical imaging procedures as sources of ionizing radiation exposure
  - Investigate best practices in patient-provider communications

## Methods

- Conducted a literature review
- Developed and administered a 17-question survey to 303 adults at 5 locations across Chittenden County, Vermont, over a 6-week period in fall 2016
- Data entered into Microsoft Excel. Quality control was randomly performed on 25% completed surveys.
- Descriptive and statistical analyses (ANOVA and Chi-squared) were conducted using SPSS

## Results

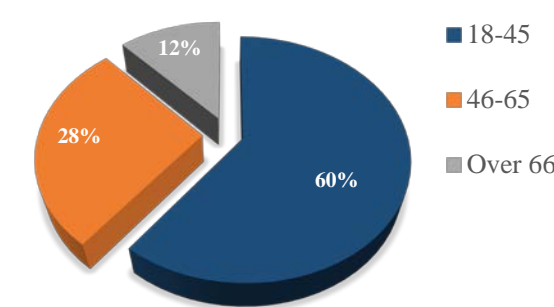


Figure 1. Age distribution of sample population (N=303).

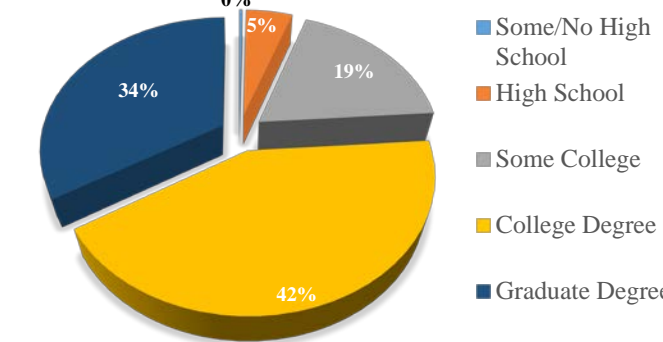


Figure 2. Education distribution of sample population (N=303).

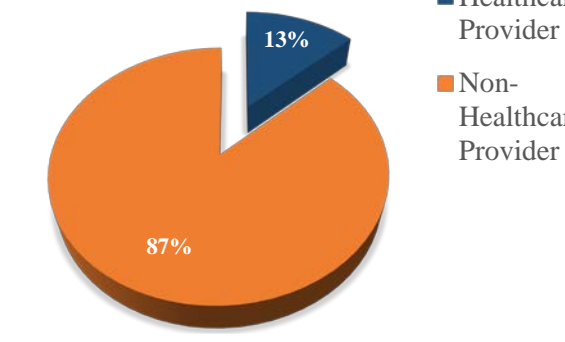


Figure 3. Number of healthcare providers within sample population (N=303).

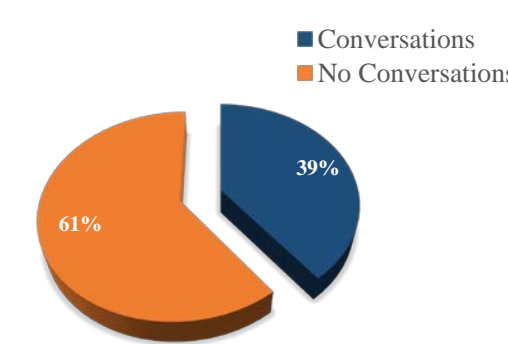


Figure 4. The proportion of the sample population who received medical imaging in the past 3 years and had a discussion with a medical professional about the potential effects and benefits of their most recent medical imaging study (N=229).

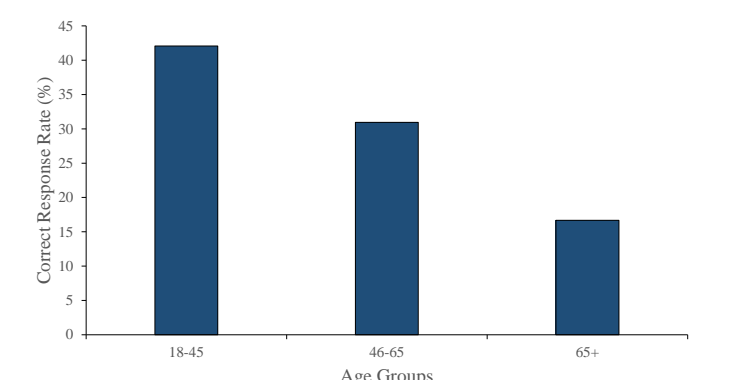


Figure 5. Correct identification of ionizing radiation dosage in a CT scan compared with that of 1 chest radiograph stratified by age groups (N=303).

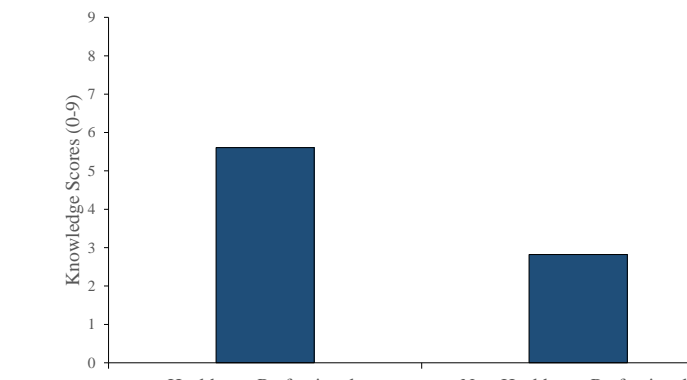


Figure 6. Correct identification of ionizing radiation exposure within medical imaging in healthcare professionals versus non-healthcare professionals (N=303).

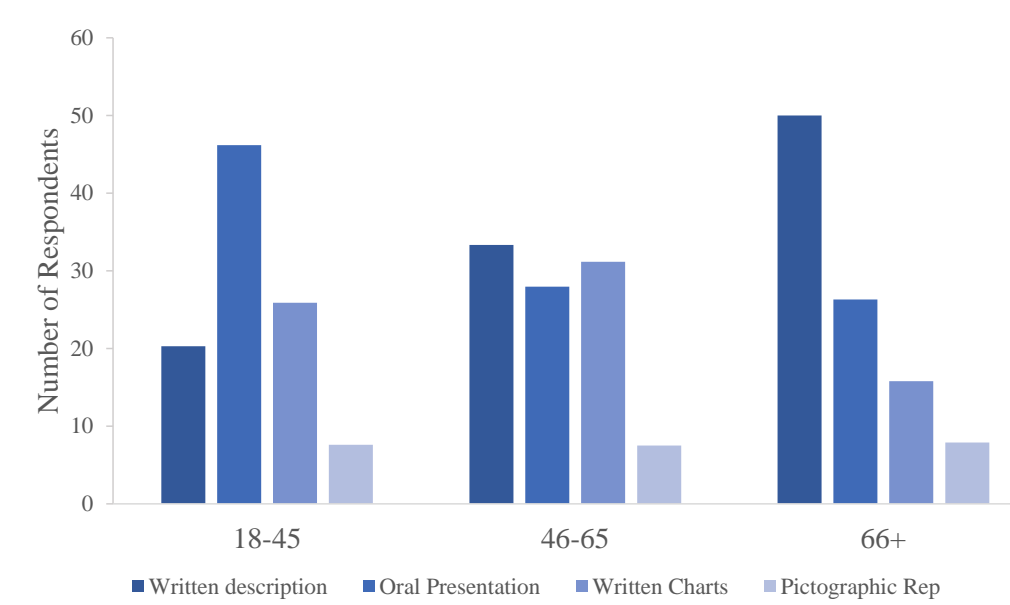


Figure 7. Preferred way to receive information regarding ionizing radiation exposure medical imaging stratified by age groups (N=303).

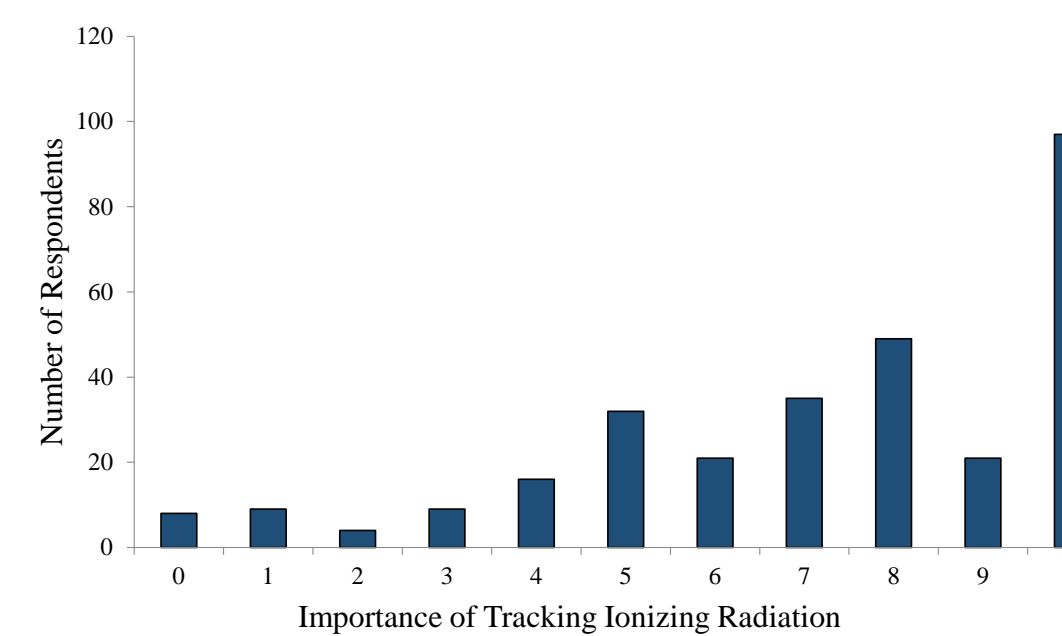


Figure 8. Importance of tracking ionizing radiation measured on a 10 point scale (0= not important; 10= important).

## Discussion

- Participants who received imaging that imparted ionizing radiation within the last three years were more likely to have had a conversation with a healthcare provider regarding their exposure to ionizing radiation ( $p<0.05$ ) (Figure 4); however, 61% getting imaging are not having conversations.
- The following factors did not impact participants' level of knowledge regarding ionizing radiation: level of education, frequency of healthcare visits, ages of people in the household, types of imaging received and frequency of conversations concerning ionizing radiation exposure.
- Healthcare providers know significantly more about ionizing radiation in medical imaging than the general public ( $p<0.001$ ), despite the high education level of survey respondents (Figure 6).
- Younger respondents (18-45) preferred verbal and older respondents (66+) preferred written materials (Figure 7).
- Most respondents stated that they think tracking ionizing radiation exposure is important and would prefer a designated tab in the electronic medical records for both patients and healthcare providers to access (Figure 8).

## Recommendations

- A standard oral presentation for pre-imaging patient-provider communication should be developed, accompanied by a written handout.
- A section of the electronic medical record that contains ionizing radiation exposure should be created for patients and physicians to track individuals' information; this should be accessible through the patient portal.