Patient Perspectives on AI Implementation in Radiology, From Generation to Generation

Nabid Ahmed MD MS, Mj Negahdar PhD MBA, Jonathan Joshi MD, Sohail Contractor MD
University of Louisville Hospital, Louisville, KY, Department of Radiology

Abstract & Background

Artificial Intelligence (AI) solutions are increasingly being adopted by medical specialties, especially radiology. From 2014-2021, the overall number of venture capital-backed healthcare AI startups increased more than fivefold. Learning how patients perceive these changes is an important aspect of upholding patient-centered care. The aim of our study was to understand patient perspectives on AI implementation in radiology and generating reports. This was achieved by looking for similarities and differences of these perspectives between and within generational cohorts.

Survey Design

A brief survey to gauge patient perceptions was designed to be taken by volunteers from any hospital setting of a medical error. This was appended with an optional comment section. The questions included:

1) Did you know that AI algorithms are being used by UofL radiologists (specialist doctors)?
2) Are you in favor of these AI algorithms assisting the radiologist (specialist doctor)?
3) Would you be willing to pay extra if both the radiologist (specialist doctor) and the AI algorithm interpreted your study rather than just the radiologist (specialist doctor)?
4) Would you be willing to pay extra if both the radiologist (specialist doctor) and the AI algorithm interpreted your study rather than just the radiologist (specialist doctor) alone?
5) Would you want to know how the AI algorithm generated the results?
6) Would you be more likely to follow recommendations from an AI-assisted or generated report than you would be to follow directions in a report generated by a radiologist (specialist doctor) alone?
7) Would you want to know how the AI algorithm generated the results?
8) Would you be more likely to accept more AI tools in medicine?
9) Who would you hold accountable if the AI tool makes an error? (AI developer, hospital, radiologist, or all)
10) Are you in favor of AI implementation in other clinical specialties?
11) Everything else remaining the same, would you choose a facility that uses AI plus a radiologist (specialist doctor) over a facility that does not have AI and the radiologist (specialist doctor) interprets your study alone?

The survey was sent to a random sample of patients who had undergone imaging studies at UofL hospitals. The survey was conducted by a third party using a survey platform and was sent via email to patients who had provided their email address during their visit.

Results to date

Survey Participants

<table>
<thead>
<tr>
<th>Demographic</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post War (1928-1945)</td>
<td>5</td>
</tr>
<tr>
<td>Boomer 1 (1946-1954)</td>
<td>36</td>
</tr>
<tr>
<td>Boomer 2 (1955-1964)</td>
<td>42</td>
</tr>
<tr>
<td>Gen X (1965-1980)</td>
<td>53</td>
</tr>
<tr>
<td>Millenial (1981-1996)</td>
<td>26</td>
</tr>
<tr>
<td>Gen Z (1997-2012)</td>
<td>7</td>
</tr>
<tr>
<td><em>did not volunteer info</em></td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>184</td>
</tr>
</tbody>
</table>

Survey Question #1: Did you know that AI algorithms are being used by radiologists (specialist doctors)?

Q2 (Based on “Yes” to Q2 and Q7)

Q4 (Based on “Yes” to Q2 and Q7)

Q12 (Based on “Yes” to Q2 and Q7)

And the survey says...

I do not have enough info about any of this to choose more than “neutral” for most options. I would need a lot of data to be informed. — Millenial

"Depends on price. If I'd be willing to pay more for AI, if I were rich, then yeah." — Gen X

"Shouldn't have to pay more money for better care! Already pay an arm + a leg! If it helps, we are in favor but should NOT cost more for the patient!" — Baby Boomers

I would like to see AI used an aid or second look, not the only determining factor, it could help with human errors. — Gen X

"My answers reflect if AI does not increase greatly the financial burden that already exists, and shows a much greater benefit to the patient." — Gen X

Discussion

Currently, the only statistically significant association of a demographic cohort with a specific response was Q1, signifying that Millennials were most aware that AI was already being used. Perhaps the underlying explanation is that Millennials are thought to be more connected digitally than the older cohorts. This reinforces that a multi-modal educational approach needs to be adopted for patient populations to ensure any misconception or hesitation towards AI implementation in radiology is addressed.

There was no association between cohorts with Q7 and Q9 responses, indicating that a desire to know more about AI in radiology and the notion of finding all parties (hospital, AI developer, radiologist) accountable for diagnostic errors associated with AI usage, spans across all generations. 66% of participants responding “yes” to Q7 and 73% of participants responding “yes” to Q9. In fact, many written comments as seen in the previous section stated that the participant did not know enough about the subject to formulate a stance.

After this is achieved, the benefits of financial savings, reduced burden of imaging volume on the radiology department, and providing higher level of care can be realized. It is expected within the next five years that using today’s technologies could result in savings of $200 billion to $360 billion annually with AI implementation in healthcare.

These insights will aid discussions between the radiologist and patient regarding AI—incorporated imaging reports (and possibly AI generated follow-up recommendations), in outlining legal responsibilities of all parties involved, and in the design of educational material that will keep patients informed of the changing healthcare landscape.

Acknowledgements

Grateful for the support of Drs. MJ Negahdar, Jonathan Joshi and Sohail Contractor.
Special thanks to RSNA for the opportunity to present our research.
Introduction:
The adoption of Artificial Intelligence (AI) solutions, particularly in radiology, is becoming increasingly prevalent. Understanding how patients perceive these technological advancements is crucial for maintaining patient-centered care and enhancing patient education.

Methodology:
To gather data, we distributed surveys to patients at an outpatient imaging center. The surveys included statements related to AI in radiology, to which participants could respond with 'Yes,' 'No,' or 'Neutral.'
Patient Perspectives on the Integration of Artificial Intelligence (AI) in Radiology

Results:

• 85% of participants were not aware of AI implementation in UofL workflow.

• Only 9% of participants expressed opposition to AI algorithms assisting radiologists, with 46% in favor and 45% neutral.
Patient Perspectives on the Integration of Artificial Intelligence (AI) in Radiology

Results (ROI):

• 15% of participants were willing to pay extra for reports interpreted collaboratively by both a radiologist and AI.

• A percentage that increased to 29% if it was demonstrated that AI assistance led to fewer missed findings.
Patient Perspectives on the Integration of Artificial Intelligence (AI) in Radiology

Results:

- 66% of participants expressed a desire to learn more about how AI algorithms function in radiology.

- 29% of participants were supportive of AI implementation in other clinical fields.
Patient Perspectives on the Integration of Artificial Intelligence (AI) in Radiology

Results:

For 34% of participants, using AI plus radiologists is a deciding factor in choosing a healthcare provider facility. 90% of these participants would like to know more about how AI works.
Conclusion:
1) Patients would like to know.
2) Patients willing to choose a center who implemented AI assisted tools.
3) Patients willing to pay extra for higher level of care.
4) Many written comments stated that the participant did not know enough about the subject to formulate a stance.

Invest in patient education

The CAIRS center has been funded by a generous endowment from the J.T. Ling family.