

# Patient Perceptions of Artificial Intelligence in the Screening, Diagnosis, and Treatment of Various Cancers: A Scoping Review

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In what scope do patients prefer artificial intelligence (AI) in medical decision-making for cancer care, and what are their associated perceptions of such use?

# Background

AI is gaining traction as a tool in the diagnosis and management of medical conditions<sup>1</sup>.

Such technology could be used to improve the patient-reported “suboptimal” cancer care described across studies, which is attributed to a lack of appointments and dissatisfaction with counseling<sup>2</sup>.

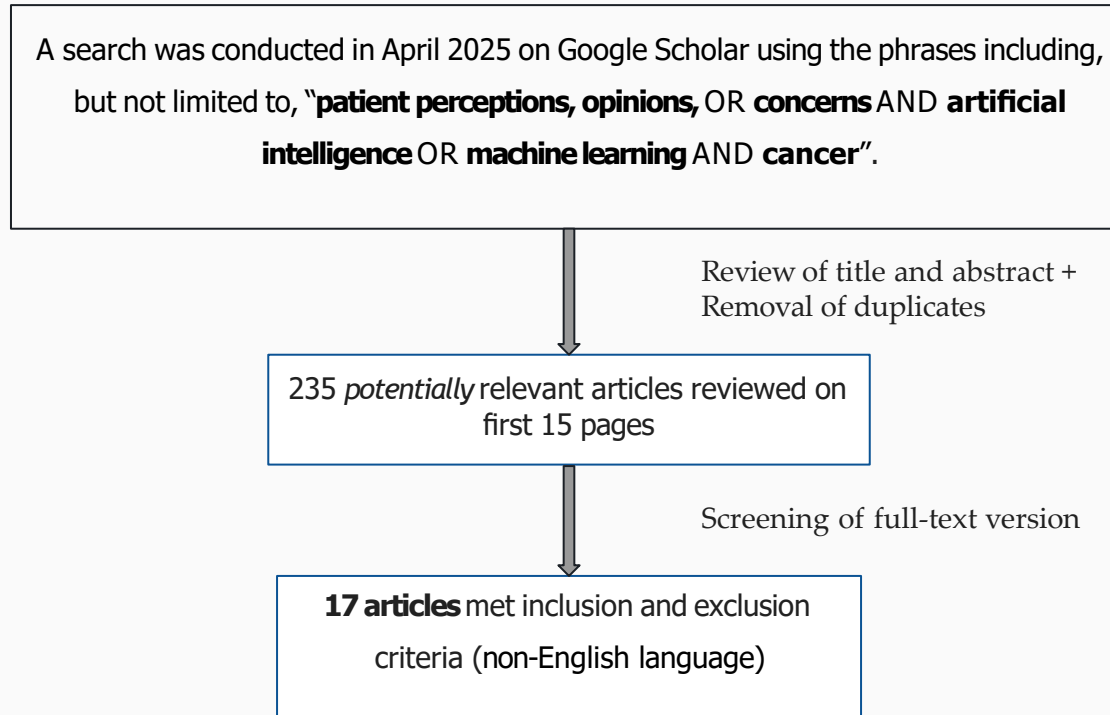
However, there are **ethical concerns** about the use of AI in such contexts; investigating patients’ perspectives is *essential* in providing patient-centered care.

This is *especially* true for cancer care, which is a complex, potentially life-changing experience for many patients.

*“I hope the system could change so [the patient] could get more information when...diagnosed with cancer...”<sup>2</sup>*

*“The wait time for oncologist appointments is unacceptable”<sup>2</sup>*

# Methods



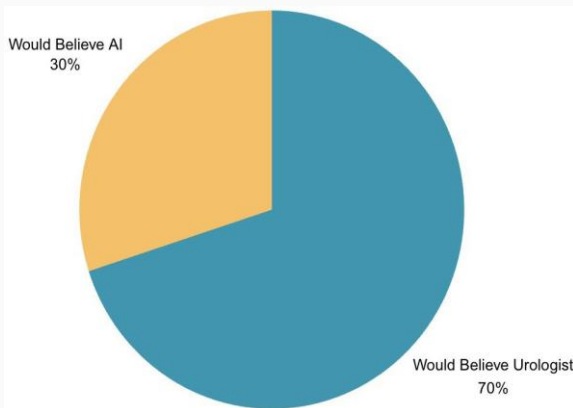
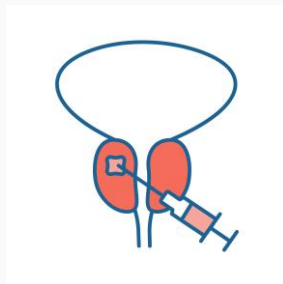
# Results

# Patient Preferences Across Steps in Cancer Care

## Screening/Diagnosis

- The majority of patients desired **AI to be used as an adjunct** to physicians<sup>3, 4, 7, 10, 12</sup>
- Across specialties, patients were **more willing to trust the opinions of physicians over AI** in the event of disagreement (Fig. 1)<sup>7, 8</sup>

**Figure 1: How Patients Receiving Diagnostic/Therapeutic Intervention for Prostate Cancer Side in Conflict**



Patients were **more amenable** to **dermatologists'** mistakes, **rejecting AI** if its **accuracy** in skin cancer diagnosis **is less than 65%**<sup>6</sup>

# Patient Preferences Across Steps in Cancer Care Cont'd.

## Screening/Diagnosis

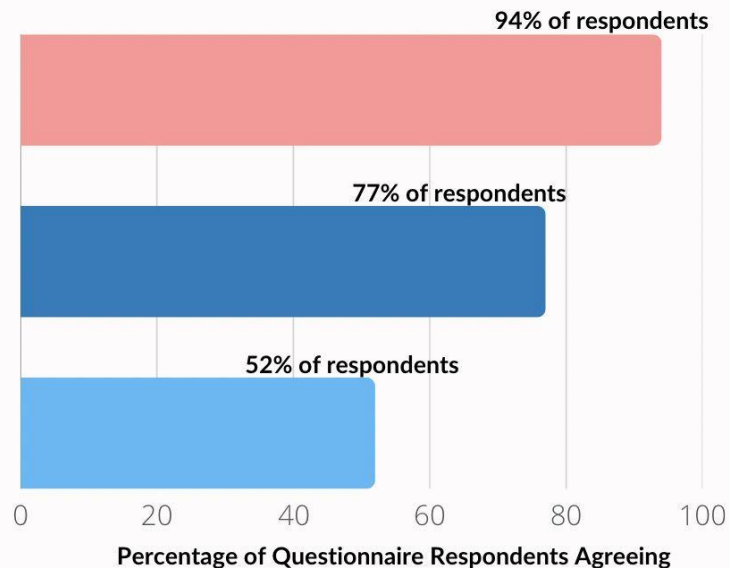
### Opinions of Women of Breast Cancer Screening Age on AI in Mammogram Interpretation<sup>9</sup>



Radiologists Should Create Their Own Reports

AI Should Be Used As a Second Reader

Software Developer And Radiologist Should Be Accountable For AI Errors



# Patient Preferences Across Steps in Cancer Care Cont'd.

## Prognosis

- Cancer survivors held **positive opinions** towards an AI prognostic tool with an ability to:
  - Predict 6-month survival
  - Changes in prognosis
  - Display survival of similar patients, which reportedly reduced feelings of isolation<sup>5</sup>
- A strong preference for an **oncologist to be present** was expressed due to:
  - *Sensitive* nature of discussion
  - **Difficulty understanding elements of the tool**, such as the Kaplan-Meier curve

*"I (have) friends who've gone through end-of-life things...it's a really confusing place to be...this tool would allow them to have a more concrete view of what was really possible, so that they can **make better decisions** about what they actually wanted to do with time..." —Cancer Survivor<sup>5</sup>*



*"The Kaplan-Meier curve I can understand, someone else who is not a scientist cannot understand..." —Cancer Caregiver<sup>5</sup>*



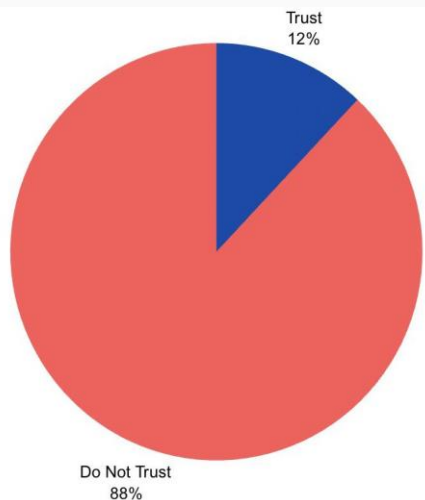
# Patient Preferences Across Steps in Cancer Care Cont'd.

## Treatment

- The majority of cancer patients at their 24 month follow-up **reported distrust** in AI (Fig. 2)<sup>6</sup>
  - 48% reported **fear**
- Patients with a recent cancer diagnosis **preferred follow-ups with human doctors**, attributing this desire to **perceived inability of AI to handle intricate situations**<sup>13</sup>



**Figure 2: Cancer Patients' Perception of AI's Ability to Generate A Treatment Plan**



Prostate cancer patients reported low trust in AI systems for complex decisions, specifically for **metastatic disease**<sup>8</sup>

Radiotherapy patients reported strong preference to be **aware and informed of the use of AI** in their care<sup>10</sup>, a desire also seen in mammogram recipients<sup>17</sup>

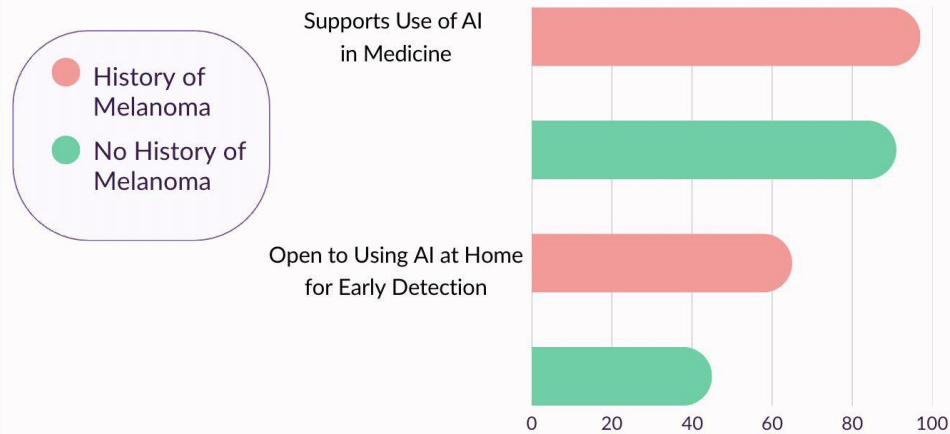
# Patient Preferences Across Steps in Cancer Care Cont'd.

## Demographic Differences

- Male patients described **more acceptance** of AI than female counterparts<sup>7</sup>
- Viewpoints **varied based on medical history** (Fig 3)<sup>7,14</sup>
- Compared to younger females, women of mammogram screening age viewed the use of AI in preventative screening **more positively**, even after reporting *lower* day-to-day AI use<sup>4</sup>
- Individuals of **higher education** were **more skeptical of AI's medical accuracy**<sup>4</sup>



**Figure 3:**  
**Patient Perceptions of AI in Skin Cancer Screening**



# Perceived Patient Outcomes

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## PERCEIVED BENEFITS

1. Reduction in wait times<sup>14</sup>
2. Increased survival rates<sup>7</sup>
3. Increased diagnostic speed and healthcare access<sup>14</sup>
4. Reduced healthcare costs<sup>14</sup>

## PERCEIVED CONCERNS

1. Privacy breaches (misuse of data by employers, insurance companies)<sup>3,13</sup>
2. Physician dependence on AI<sup>7</sup>
3. Bias in algorithms<sup>3</sup>
4. Hindrance of the patient-provider relationship<sup>3,13</sup>

*"Rather than...pondering for weeks or months whether it's time to go see the doctor, (AI could be) an immediate indicator."*<sup>11</sup>

# Limitations

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01

Studies included focused on breast, skin, and/or prostate cancer

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02

Most patient populations were predominantly White, with many reporting higher income and education levels than the general population<sup>5, 14</sup>

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03

AI is constantly evolving; patient perceptions may also shift depending on changes, reducing the generalizability of results

# Conclusions

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## Patient Communication Takeaways

The results of this review underscore the **importance of transparency** and **patient counseling** on the **utilization of AI in the medical-decision making process** and its **limitations**

## The Use of AI as An Adjunct

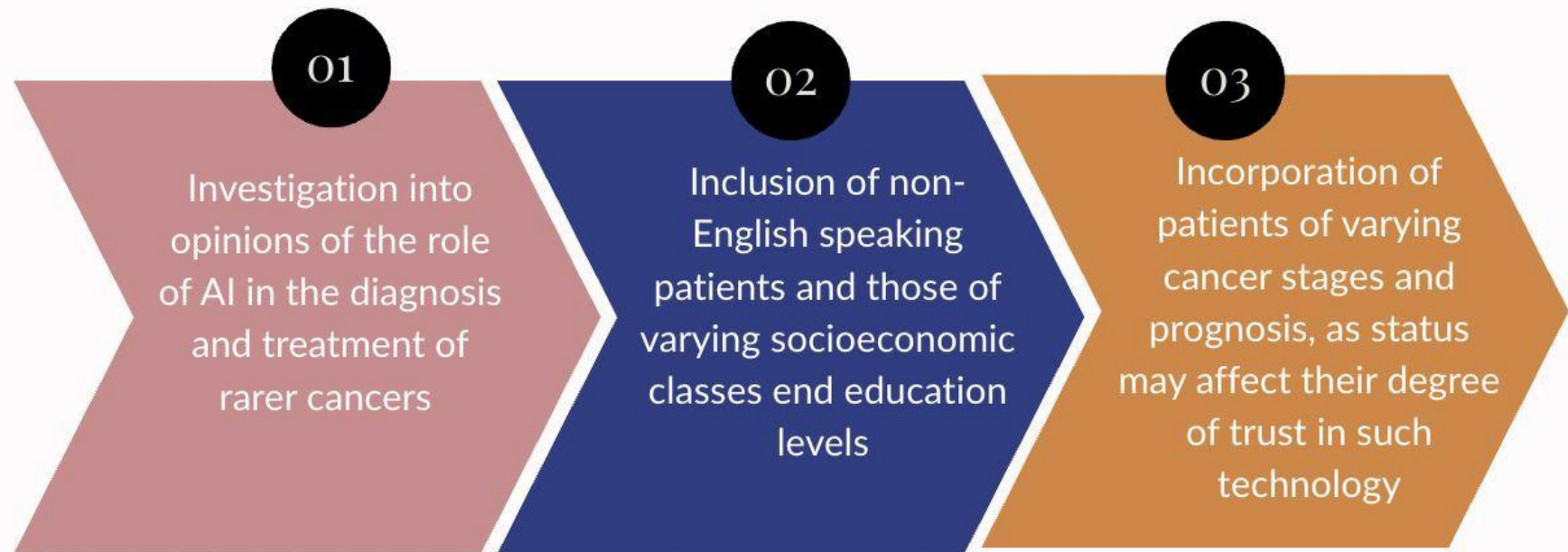
While patients viewed AI favorably, they **opposed its entire replacement of physicians**



## Patient-Provider Relationship

Providers should continue to striving to **preserve the emotional connection** in patient-provider relationships

# Future Directions



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# Questions?

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