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Review Article

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Using AI to Understand Why People Avoid Cancer Screenings

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Abstract

Cancer screenings are critical for early detection and successful treatment. However, large numbers of individuals continue to delay or avoid screenings due to a wide range of psychological, emotional, cultural, and logistical factors. The focus of this paper is to examine why higher amounts of individuals delay cancer screenings and the different mindsets of those individuals. The paper finishes with AI developing strategies for medical professionals aimed at reducing the number of people that avoid cancer screenings.

Keywords: Ai in Healthcare Communication, Cancer Screening Behavior, Mind Genomics, Mindset Segmentation, Patient Engagement, Personalized Health Messaging.

Introduction

Even though cancer screenings are widely promoted, many people still avoid or delay them [1]. One reason is that traditional health messages do not always match how people think or feel [2]. Everyone has different beliefs, emotions, and concerns that affect whether they choose to get screened [3].

This study uses Mind Genomics and AI (Idea Coach of BimiLeap.com) to better understand these differences [4]. We asked 100 people to respond to short messages (called vignettes) about cancer screenings. By examining their responses to the vignettes, they were able to be grouped into three main mindsets. This helped create messages and strategies that can help medical professionals communicate the importance of getting regular cancer screenings to these specific individuals [5].

Mindsets Derived from Study

Mindset 1—The Proactive Realists: This group understands the seriousness of cancer and values early detection. While they fear a positive result, they trust medical evidence and providers. They respond well to messages about expert advice, statistics, and personal responsibility.

Mindset 2—The Reluctant Skeptics: This segment is skeptical of screenings, especially when feeling healthy, and worries about financial and emotional costs . Messages that highlight ease, comfort, and affordability are more effective [6].

Mindset 3: The Avoidant Emotionals: Driven by fear and discomfort, this group tends to avoid screenings [7]. They respond best to empathetic messages, personal stories, and emotionally supportive environments [8]. Presenting screenings as a way to care for loved ones can ease their resistance.

Table 1 presents the three mindsets found in the study. For each mindset, there is a messaging strategy identified using AI that would be able to help individuals, such as medical professionals, communicate the importance of cancer screenings to different people that may fall into one of these mindsets.

Table 2 shows the segments within each mindset, reflecting different beliefs, emotions, and barriers. These segments help providers move beyond generic messaging to more personal, respectful communication that builds trust and encourages screening.

Understanding how people think and feel about cancer screenings helps improve public health. Tailoring messages to mindset segments builds trust, encourages screening, and leads to better care for all.

Table 1: Three mindsets toward cancer screenings.

Mindset	Dominant Barrier	Top Motivator	Messaging Strategy
Mindset 1: The Proactive Realists	Fear of a positive diagnosis	Belief in early detection and doctor's advice	Evidence-based, physician-led communication
Mindset 2: The Reluctant Skeptics	Cost concerns and feeling healthy	Lowering financial/emotional cost	Practical messaging with reassurance of comfort and affordability
Mindset 3: The Avoidant Emotionals	Fear of discomfort or emotional toll of screenings	Emotional reassurance and family influence	Empathetic messaging emphasizing support and care

Table 2: Segmented mindsets in cancer screening.

Segment	Mindset	Description	Professional Guidance
Early Detection Advocates	Mindset 1: Proactive Realists	Trust in medicine, value early detection, responsive to medical authority.	Use authoritative and fact-based messages. Reinforce benefits of early detection.
Cancer-savvy but skeptical community members	Mindset 2: Reluctant Skeptics	Informed but cautious; skeptical of overdiagnosis and cost.	Respect autonomy. Present clear and balanced information with transparency about benefits vs. risks.
Barrier-conscious segment of individuals	Mindset 2: Reluctant Skeptics	See screenings as inconvenient or financially inaccessible.	Address logistical and financial concerns. Provide low-cost, convenient options.
Culturally and Religiously Influenced Cancer Screening Attitudes	Mindset 3: Avoidant Emotionals	Hesitant due to cultural norms or religious modesty.	Frame screening as part of respectful self-care. Offer gender-matched providers or private settings.
Screening Aversion & Education Seekers	Mindset 3: Avoidant Emotionals	Fearful of process but open to more information.	Offer simple, visual explanations and walk-throughs. Normalize the process.
Religious and cautious about medical screenings	Mindset 3: Avoidant Emotionals	Guided by religious beliefs and cautious about procedures.	Use respectful, values-based language. Position screening as responsible stewardship of health.

Using AI to Identify and Address Cancer Screening Mindsets

Large Language Models (LLMs) like ChatGPT can use mindset profiles to generate personalized messages that address each group's specific concerns. For example, Avoidant Emotionals may need comforting, supportive language, while Proactive Realists respond better to evidence-based messages. Table 3 shows sample messages tailored to each segment.

Table 3: AI-generated messages tailored to each mindset.

Mindset	Sample AI Messages	Tone/Strategy
Proactive Realists	"Screenings save lives. Your doctor recommends it because early action leads to better outcomes." "This test is routine, accurate, and can detect issues long before symptoms appear."	Authoritative, informative, logical
Reluctant Skeptics	"We understand that health care can feel expensive—but most screenings are covered or low-cost." "Feeling healthy doesn't always mean you're in the clear. Screenings catch silent issues before they grow."	Reassuring, practical, cost-sensitive

Avoidant Emotionals	"You're not alone—many people feel nervous. We'll be with you every step of the way." "Think of screenings as a gift to your future self and your loved ones."	Warm, supportive, emotionally safe

Public Health and Policy Implications

A one-size-fits-all health outreach ignores the psychological differences that shape how people think, feel, and decide about cancer screenings which can strongly affect participation.

Tailored messaging that aligns with a person's worldview is more likely to be trusted, remembered, and acted upon [9]. In turn, this can lead to higher compliance with screening guidelines, earlier detection of disease, and reduced disparities in health outcomes [10].

Reluctant Skeptics may dismiss standard reminders but respond to community-based outreach with free, convenient options like mobile clinics or local pop-up events [11].

In contrast, Avoidant Emotionals may require a softer, emotionally grounded approach. These groups respond well to family stories, peer testimonials, or faith-based messages shared by trusted community voices on familiar platforms.

LLMs can automate tailored messaging, choosing the right content, tone, and timing for each segment [12]. This makes personalized outreach scalable and efficient. Using this psychological insight helps public health efforts connect with people more personally and effectively [13]. As cancer screening rates continue to lag in certain populations, this approach offers a promising path forward.

Applications in Training and Professional Education

Clinical training often misses how differently patients think and feel about care [14]. Teaching mindset-based approaches gives providers tools to better connect with each patient [15].

Mind Genomics can help schools create training that shows how to talk to patients with different mindsets. Using case studies or role plays, students can practice changing their tone and approach to fit how each patient thinks and feels [16]. Using mindset insights in daily practice helps clinicians connect with diverse patients, build trust, and improve outcomes [17]. As healthcare moves toward personalization, this skill should be essential for all providers [18].

Future Research Directions

A key research focus is whether tailored messaging leads to lasting engagement and trust [9]. Tracking screening rates and beliefs over time can show if mindset-based approaches create sustained change.

Another key area is how mindsets change over time [19]. Life events, provider experiences, or health campaigns can shift attitudes [20]. Studying this can help update outreach as people's views and needs evolve.

There is also significant potential in applying generative AI for real-time, personalized outreach. Generative AI tools like chatbots and SMS campaigns can tailor messages in real time to fit each patient's mindset [21]. For example, cautious users may get gentle, values-based messages, while skeptics receive clear facts and FAQs [22].

In addition, future research should explore the cultural, regional, and demographic variations in mindset distribution [23]. Do certain mindsets appear more frequently in rural vs. urban settings? Are specific cultural or faith-based communities more likely to exhibit emotional avoidance or trust-based decision-making? Understanding these patterns can help tailor outreach to local values instead of relying on broad national assumptions [24].

Lastly, there's room to investigate how this data could be built into Electronic Health Records (EHRs), scheduling, and triage tools to make personalized care part of everyday clinical practice [25]. By answering these questions, future research can help incorporate mindset segmentation into a standard framework for personalized preventive care.

Discussion

Each mindset shows how different thoughts, emotions, and life factors shape cancer screening decisions [26]. People do not just respond to facts, they filter messages through their beliefs, fears, and past experiences, which can either help or block action [27].

Recognizing these differences is not about labeling people but about creating the right conditions for engagement. A message that works well for one group may be ignored, or even rejected, by another [28].

This level of behavioral personalization mirrors what is already happening in fields like marketing, education, and mental health, where segmentation is standard practice [29]. Applying it to cancer screening could boost participation, enable early detection, and reduce healthcare costs [30].

This study shows that cancer screening is as much of a communication challenge as a medical one. Mindset segmentation helps bridge the gap between information and action with messages that truly connect.

Conclusion

This study, grounded in the principles of Mind Genomics, identified three distinct mindsets that shape how individuals perceive and respond to cancer screening opportunities. These mindsets—Proactive Realists, Reluctant Skeptics, and Avoidant Emotionals—reflect meaningful differences in trust, motivation, emotional readiness, and perceived barriers.

Tailoring outreach to mindset profiles boosts screening rates, reduces disparities, and supports early detection. Understanding how people think is as vital as knowing what they need, and it

can save lives.

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