

Exploring the Impact of Artificial Intelligence Integration in Pediatric Healthcare for Patient Education

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Background

The integration of technology in healthcare has revolutionized the way services are delivered and experienced, with growing emphasis on using artificial intelligence (AI) to improve patient care, enhance caregiver engagement, and optimize clinical efficiency, especially in the pediatric healthcare settings

- Gaps in patient care often result from a lack of personalized and accessible patient education materials, with caregivers frequently reporting feeling overwhelmed and inadequately informed about their child's condition and treatment plans [2].
- Low health literacy is associated with poorer health outcomes in children, including higher rates of hospitalization and less effective management of chronic conditions [1].
- Culturally and linguistically tailored education programs/materials are essential for improving health literacy in pediatric care [1].
- AI can analyze vast amounts of medical data to identify patterns and trends that may not be apparent to clinicians, leading to more effective treatments and improved patient outcomes [4].
- AI tools like ChatGPT-4 show potential in patient education, by correctly answering 84.6% of the most frequently asked questions in amblyopia and childhood myopia, with 96.4% agreement between two pediatric ophthalmologists on their assessment of the responses [5].

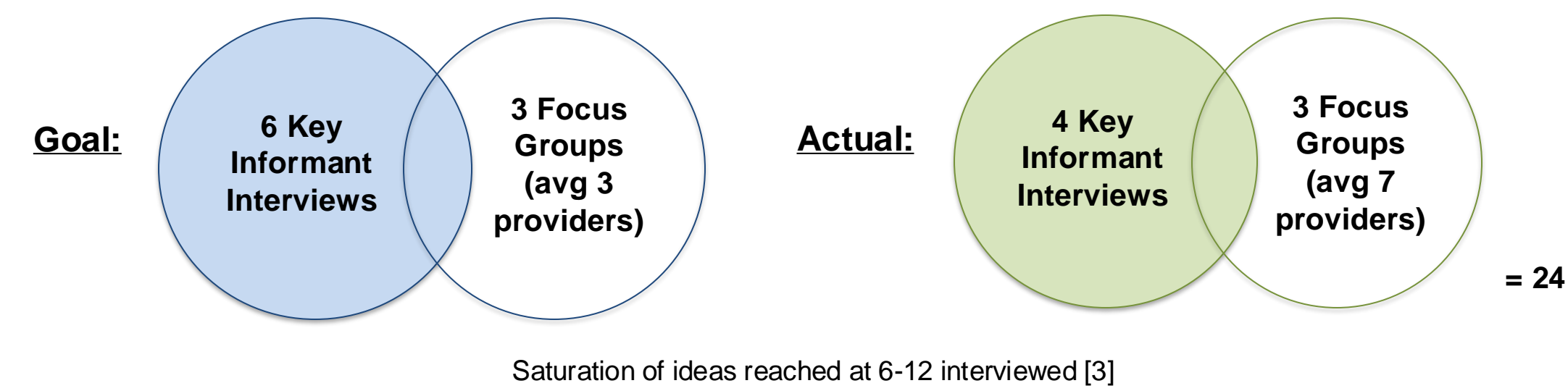
Despite these advancements, there remain significant gaps in patient education materials, particularly in how they are perceived and utilized by healthcare professionals.

Aim

Explore clinical providers' and healthcare workers' perspectives on existing gaps in patient education in pediatric healthcare and evaluate the potential for artificial intelligence (AI) to bridge these gaps.

Methods

Study Design: Qualitative Analysis of Key Informant Interviews and Focus Groups



Excel was used for thematic analysis of the interview data.

Inclusion criteria

- Age: 25-80 years old.
- Gender and ethnicity to resemble Connecticut's demographic distribution.
- Professional experience or expertise in pediatric healthcare (e.g., pediatricians, hospitalists, family medicine providers, pediatric specialists).
- Participants from diverse backgrounds and roles, including various healthcare settings (hospitals, clinics, community health centers).
- Practice location: Connecticut.

Length of each interview:

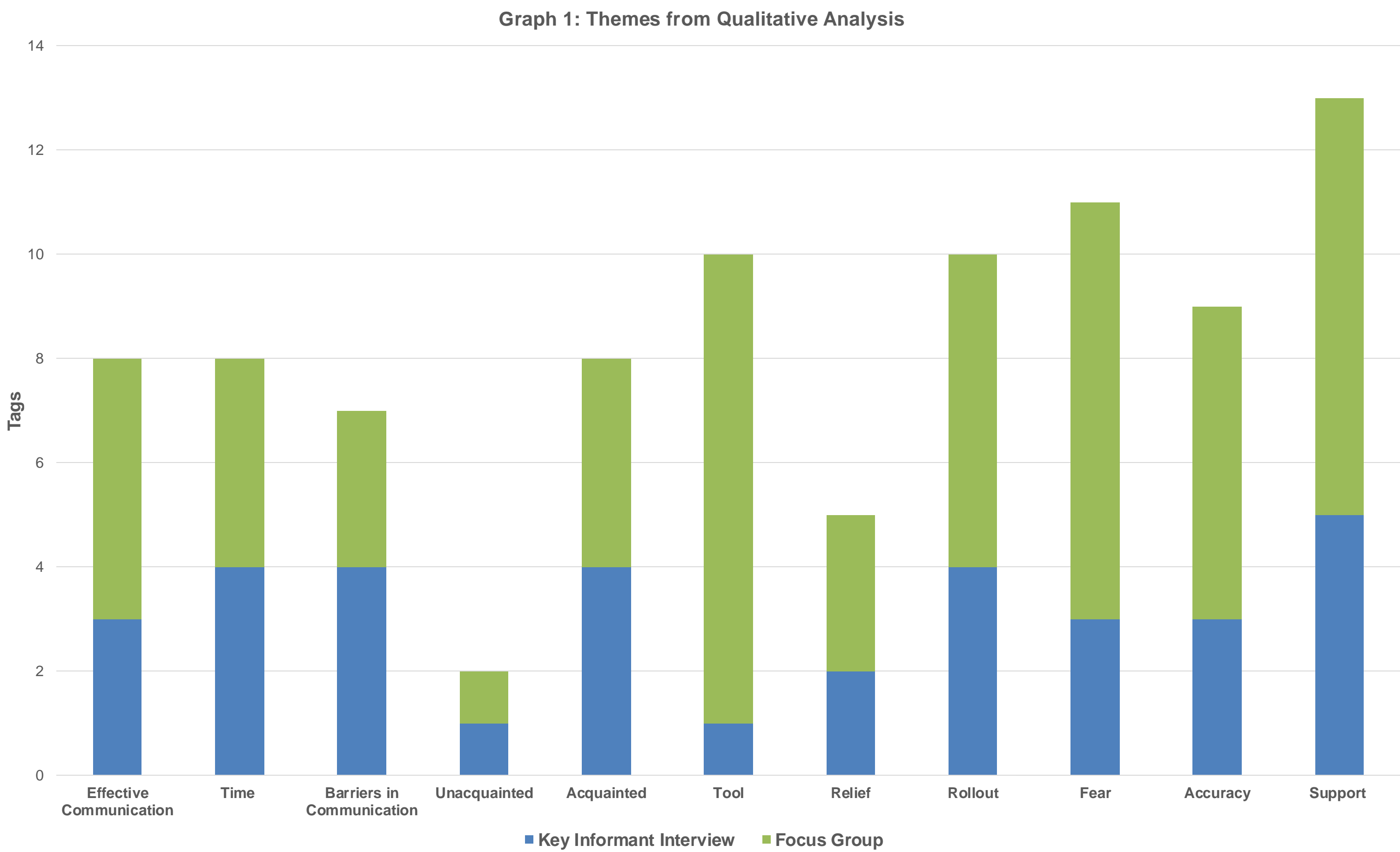
- Key Informant Interview: 30-45 minutes
- Focus Group: 45-60 minutes

Interview Guides

Focus Group
Case Scenario
Imagine a pediatric clinic located in a busy urban area that serves a diverse population of children and their families. The clinic has noted significant gaps in its patient education efforts, which are impacting patient outcomes and satisfaction. These include: Time constraints as a provider: healthcare providers often spend considerable time searching for appropriate education materials during patient visits, taking away from valuable face-face time and leading to inefficiencies in clinic operations. Diverse Patient Needs: the clinic's patient population varies in health literacy levels, language proficiency, and cultural backgrounds. Limited Resources: the clinic has limited budget and staff. Lack of Patient Engagement: there is a noticeable gap in patient engagement and understanding of medical information, leading to poor adherence to treatment plans and follow-up care. To address these challenges, the clinic is considering AI driven patient education material which is set to provide reliable information in the preferred language and literacy level instantaneously saving time for patient-focused care.
Questions
1. What are your initial thoughts on the specified scenario, and have you encountered problems/gaps in patient education such as these within the clinical setting?
2. What strategies do you think would be most effective in addressing these gaps in patient education?
3. Now, how do you think AI can address these gaps and enhance patient education materials?
4. On a broader scale, where do you see AI's impact for primary/patient care?
5. What concerns or challenges do you foresee with integration of AI into pediatric healthcare
6. What recommendations would you make in the implementation of AI given these concerns (i.e. how would you address these concerns)?

Key Informant Interview
Case Scenario
Imagine you are in a clinic with patients speaking 8 different languages. Many have poorly controlled pediatric asthma, making it hard to educate them on medication use. Each patient has different insurance coverage. Today, you meet an 8 year old Spanish speaking girl with low health literacy parents. As her provider, you use the practice's PHI-protected Large Language Model (AI) linked to the EHR system. This AI generates asthma treatment instructions (in the appropriate language, and health literacy level), checks insurance for inhaler coverage, sets up important reminders for the parents, and provides educational material to the family, reinforcing what was shared during the visit. This saves you time as her provider, allowing more focus on patient care.
Questions
1. How do you define effective patient education in pediatric healthcare for patients and their families?
2. Can you describe the most significant gaps you see in patient education in pediatric healthcare today, and what do you believe are the primary causes?
3. After hearing this case scenario, what are your initial thoughts? Were you aware AI had this potential?
4. Have you encountered anything like this, or any other AI technologies/applications in healthcare?
5. What concerns or challenges do you foresee with integration of AI into pediatric healthcare?
6. What recommendations would you make in the implementation of AI given these concerns?

Results



Key Examples

- **Barriers to Communication:** "It's the medical complexity of stuff. Medical students, residents are taught at one level of complexity... Being able to find ways to explain what you learned as a physician to resonate with people, is the art of medicine." (AIPH001-01)
- **Relief:** "What you just laid out here is an automation of ding like nine different processes that I would have to do manually ... My knee jerk reaction is Hazzah." (AIPH001-01)
- **Tool:** "I've been in offices and rotated in offices where they use AI for their documentation. And this worry that AI is going to take over the practicing physician is just not something that I saw. These doctors were able to get back to practicing medicine. To talking with the patient. And not sitting behind their computer screen." (AIPH001-01FG)
- **Rollout:** "The problem is that the population that would benefit the most is our population with low literacy and a lot of the population doesn't speak English. And that's the population it would be cost prohibitive to." - R3 (AIPH001-02FG)
- **Accuracy:** "As long as things are accurate and evidence based. As long as AI is drawing from the appropriate sources that we know are evidence based with adequate data then I wouldn't have an issue with it no." (AIPH001-02)
- **Support:** "I think moving forward, while its great that we are here sitting around and getting the provider's perspective, its important not to forget about the patients. Set up focus groups just like this one with black folks, Hispanic folks, and other members of the community and here what they have to say." – R7 (AIPH001-03FG)

Discussion

The aim of this study was to explore clinical providers' and healthcare workers' perspectives on the use of artificial intelligence (AI) for patient education in pediatric healthcare settings, with a focus on identifying existing gaps in patient education and evaluating AI's potential to address these challenges. Through key informant interviews and focus groups, several key themes emerged from the analysis of the participants' responses.

Keys to Patient Education:

- Effective Communication

Current Gaps in Patient Education:

- Time
- Barriers to Communication (Topics: Language, Health Literacy)

Potential of AI in Addressing Gaps:

- Unacquainted
- Acquainted
- Relief
- Tool

Concerns about AI Implementation:

- Rollout (Topics: Biases, Trust, Continuing Medical Education, Cost)
- Accuracy
- Fear (Topics: Patient Hesitancy, Overreliance)

Recommendations for AI Integration:

- Support (Topics: Patient Support, Monetary Support, Provider Support)

Future Directions

The data collected in this research project will inform the development of two surveys designed to explore the impact of technology integration in pediatric healthcare further. The themes identified will be used to formulate evidence-based questions for inclusion in the surveys, ensuring their relevance and validity. This data provides valuable insights into the integration of artificial intelligence for patient education.

References

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