

## Review Article

# Enhancing Patient-Centered Care in Leukemia Treatment: Insights Generated by a Mind-Set Framework Co-developed with AI

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## Abstract

Leukemia is a challenging and complex cancer which significantly impacts patients' lives. Understanding patient perspectives and needs is crucial for providing effective care and support. This study develops a framework for understanding patient mind-sets and their implications for leukemia care with the assistance of AI. Through the identification of five key mind-sets (Proactive, Anxious, Acceptance, Emotional, and Uncertain) and the mapping of the leukemia journey stages, we analyze patient needs and perspectives at each stage. The findings reveal critical points for intervention and support and suggest strategies for tailoring communication and care to patient mind-sets. We also propose a set of sample questions and tools for assessing patient mind-sets in clinical practice. The mind-set framework offers valuable insights for improving patient-provider communication, enhancing psychosocial support, and optimizing treatment adherence and outcomes. This study contributes to the growing body of knowledge on patient-centered leukemia care and provides a foundation for future research and practice. This framework provides a valuable tool for healthcare providers to deliver more personalized, effective patient care and support in leukemia.

## Introduction

Leukemia is a life-altering cancer which poses significant physical, emotional, and social challenges for patients. As they navigate the complex journey of diagnosis, treatment, and survivorship, patients may experience a wide range of emotions, uncertainties, and coping strategies. Understanding patient perspectives and needs is essential for providing effective, compassionate, and patient-centered care. The importance of patient-centered care in oncology has been increasingly recognized in recent years. Studies have shown that incorporating patient perspectives and preferences into treatment planning can lead to improved patient satisfaction, treatment adherence, and health outcomes [1,2]. In the context of leukemia, research has highlighted the diverse psychosocial needs of patients and the importance of tailored support throughout the cancer journey [3,4]. The concept of patient mind-sets, or the cognitive and emotional frameworks through which individuals approach their health experiences, has gained attention as a valuable tool for understanding and addressing patient needs. The work of Howard R. Moskowitz, a pioneer in the field of consumer psychology, has demonstrated the power of mind-set segmentation in developing targeted marketing strategies [5]. Moskowitz's approach involves identifying distinct consumer mind-sets based on their attitudes, beliefs, and preferences, and tailoring product offerings and communication strategies to each segment. While originally developed in the context of consumer behavior, the mind-set segmentation approach has since been applied to various domains, including healthcare [6], and has since been updated to incorporate contributions

from AI [7]. Building on this foundation, we developed an AI-assisted methodology to develop a detailed patient mind-set framework for leukemia care. In this study, we aim to develop a framework for understanding patient mind-sets and their implications for leukemia care and support. By identifying key mind-sets, mapping the leukemia journey stages, and proposing tools for assessing patient mind-sets, we seek to provide insights into patient experiences and inform strategies for enhancing care and support throughout the leukemia journey. Our approach draws upon the principles of mind-set segmentation, as well as the growing body of literature on patient-centered care in oncology.

It is important to note that whereas the concept of patient mind-sets offers a valuable lens for understanding patient experiences, it should not be used to stereotype or pigeonhole individuals. Patients may exhibit characteristics of multiple mind-sets, and their perspectives and needs may evolve throughout the cancer journey. The mind-set framework is intended to serve as a guide for tailoring care and support, rather than a rigid classification system. Healthcare providers should use the framework in conjunction with other patient-centered assessment tools and engage in ongoing dialogue with patients to ensure that their individual needs and preferences are met.

## Method

### Developing the Mind-set Framework

The mind-set framework was developed through an iterative process of conversational prompting and analysis using the Claude.

ai Opus language model [8]. Five key mind-sets were identified: Proactive, Anxious, Acceptance, Emotional, and Uncertain. Each mind-set was further elaborated upon, with descriptions of their characteristics, thought processes, and needs.

### Mapping the Leukemia Journey Stages

The mapping of the leukemia journey stages was accomplished through the AI-assisted conversation. A comprehensive map of the leukemia journey was developed, including 11 key stages: Initial Diagnosis, Further Testing and Classification, Treatment Planning, Transplant Consideration (if applicable), Induction Therapy, Hospital Discharge, Consolidation Therapy, Maintenance Therapy, Monitoring and Follow-up, Supportive Care, and Survivorship and Long-term Care.

### Analyzing Patient Needs and Perspectives

To explore patient needs and perspectives at each stage of the leukemia journey, a series of stage-specific questions was developed through the AI-assisted conversation. The resulting analysis of patient needs and perspectives was synthesized from this AI-generated content, providing a comprehensive profile of the key concerns, emotions, and support needs at each stage of the leukemia journey for each of the five identified mind-sets.

## Results

### Patient Mind-sets and Their Implications

The analysis revealed five distinct patient mind-sets, each with specific characteristics, needs, and implications for care (Table 1). Mapping these mind-sets to the stages of the leukemia journey provided a framework for understanding patient experiences and tailoring support strategies. The five identified mind-sets (Proactive, Anxious, Acceptance, Emotional, and Uncertain) represent distinct approaches to the leukemia journey, with significant implications for patient needs, preferences, and coping strategies.

The Proactive mind-set is characterized by a desire for information, active involvement in decision-making, and a focus on problem-solving. Patients with this mind-set may benefit from detailed explanations of their diagnosis and treatment options, collaborative care planning, and resources for self-management. Healthcare providers should engage these patients in shared decision-making and provide them with the tools and information they need to take an active role in their care. In contrast, patients with an Anxious mind-set may struggle with worry, fear, and a need for frequent reassurance and support. These patients require a high level of emotional support and guidance in managing their fears and uncertainties. Healthcare

providers should prioritize clear, empathetic communication and connect these patients with resources for mental health support and stress management. The Acceptance mind-set is characterized by a realistic, action-oriented approach to the leukemia journey, with a focus on maintaining a sense of normalcy. Patients with this mind-set may benefit from clear, direct communication about their diagnosis and treatment plan, as well as support in adapting to the challenges of cancer while maintaining their daily routines and activities. Patients with an Emotional mind-set have a strong need for validation, empathy, and emotional support throughout their journey. They may struggle with the psychological impact of cancer and require extensive resources for coping and self-care. Healthcare providers should prioritize empathetic, non-judgmental communication and connect these patients with counseling and support services. Finally, the Uncertain mind-set is characterized by doubt, indecision, and a need for clarity and guidance. Patients with this mind-set may struggle to navigate the complex decisions and challenges of the leukemia journey and may benefit from decision support tools, clear explanations of their options, and ongoing guidance from their healthcare team.

### The Leukemia Journey and Patient Experiences

The mapping of the leukemia journey stages reveals key medical and social challenges at each point in the patient experience (Table 2).

The leukemia journey is marked by a series of medical and social challenges which evolve over time, from the initial shock and uncertainty of diagnosis to the long-term implications of survivorship. At each stage, patients face a unique set of physical, emotional, and practical concerns which require targeted support and intervention. The AI-discovered stages not only make intuitive sense but resemble stages published in IQVIA's global patient and carer experience survey (2013), funded by a consortium of three leukemia patient advocacy networks. Table 3 shows that the IQVIA framework covers the same stages in a more summary form [9]. The AI-generated stages map perfectly to the IQVIA stages while offering greater specificity. From a clinical perspective, both maps "work" but the AI-generated stages seem to be able to guide the patient experience in a more granular fashion throughout the leukemia journey.

The initial stages of diagnosis and treatment planning are often characterized by intense emotions, complex decision-making, and a need for clear, compassionate communication from the healthcare team. As patients progress through treatment, they may struggle with the physical and emotional toll of therapy, as well as the challenges of maintaining a sense of normalcy in their daily lives. The transition to post-treatment survivorship brings its own set of uncertainties and

Table 1: Patient mindsets and their implications.

Mind-Set	Key Characteristics	Implications for Care and Support
Proactive	Information-seeking, active decision-making, problem-solving	Benefit from detailed explanations, collaborative care planning, and resources for self-management
Anxious	Worry, fear, need for reassurance and support	Require frequent reassurance, emotional support, and guidance in managing fears and uncertainties
Acceptance	Realistic, action-oriented, focus on normalcy	Benefit from clear, direct communication and support in maintaining a sense of normalcy
Emotional	Strong need for emotional support, validation, coping	Require extensive validation, empathy, and resources for coping with the psychological impact of the journey
Uncertain	Doubt, indecision, need for clarity and guidance	Benefit from guidance, decision support, and help in navigating complex decisions and adapting to changing circumstances

**Table 2:** The Leukemia journey and corresponding patient experiences.

Stage	Description	Key Challenges	Support Needs
<b>Initial Diagnosis</b>	Receiving the news of a leukemia diagnosis	Shock, fear, uncertainty, complex decisions about testing and treatment	Emotional support, clear information, guidance in decision-making
<b>Further Testing and Classification</b>	Undergoing additional tests to determine the specific type and subtype of leukemia	Anxiety about test results, understanding implications of diagnosis	Clear explanations of tests and results, emotional support, guidance in understanding diagnosis
<b>Treatment Planning</b>	Discussing and deciding on the best course of treatment based on the type of leukemia and individual factors	Emotional impact of diagnosis, communication with loved ones, weighing treatment options and side effects	Psychosocial support, resources for communication and decision-making, detailed information on treatment options
<b>Transplant Consideration (if applicable)</b>	Evaluating the need for and feasibility of a stem cell transplant	Complex decision-making, fear and uncertainty about transplant process	Detailed information about transplant options and process, emotional support, decision-making tools
<b>Induction Therapy</b>	Receiving intensive chemotherapy to achieve remission	Intense physical and emotional challenges, managing side effects, maintaining normalcy	Support in managing side effects, emotional coping strategies, resources for maintaining a sense of normalcy
<b>Hospital Discharge</b>	Transitioning from inpatient to outpatient care	Uncertainties, transition to home care, new support needs	Guidance in transitioning to home care, resources for managing challenges, ongoing support
<b>Consolidation Therapy</b>	Receiving additional chemotherapy to prevent relapse	Ongoing management of side effects, emotional coping, lifestyle adjustments	Strategies for managing side effects, emotional support, resources for adapting to lifestyle changes
<b>Maintenance Therapy</b>	Receiving long-term, low-dose chemotherapy to maintain remission	Long-term management of side effects, emotional coping, adapting to a "new normal"	Ongoing support for managing side effects and emotional challenges, resources for maintaining quality of life
<b>Monitoring and Follow-up</b>	Undergoing regular check-ups and tests to monitor for signs of relapse	Fear of recurrence, need for vigilance, redefinition of normalcy	Psychosocial support, guidance in managing fear and uncertainty, resources for redefining normalcy
<b>Supportive Care</b>	Receiving comprehensive care to address physical, emotional, and practical needs throughout the journey	Navigation of complex physical, emotional, and social needs	Comprehensive support for physical, emotional, and social needs, coordination of care across multiple providers
<b>Survivorship and Long-term Care</b>	Adjusting to life after treatment and managing long-term effects	Integration of cancer experience into identity and purpose, ongoing physical and emotional challenges, fear of long-term effects	Resources for finding meaning and purpose, ongoing support for physical and emotional well-being, guidance in managing long-term effects of treatment

**Table 3.** Leukemia Stages, IQVIA and Study Stages Mapped.

IQVIA Framework	Current Study Stages Developed by AI
<b>Diagnosis</b>	Initial Diagnosis; Further Testing and Classification
<b>Watch and wait</b>	Treatment Planning (note: primarily for CLL patients)
<b>Treatment</b>	Treatment Planning; Transplant Consideration (if applicable); Induction Therapy; Hospital Discharge; Consolidation Therapy; Maintenance Therapy
<b>Ongoing Monitoring</b>	Monitoring and Follow-up
<b>Living with Leukemia</b>	Survivorship and Long-term Care; Supportive Care

**Table 4:** Strategies for Enhancing Patient Care and Support.

Mind-Set	Communication Strategies	Support Strategies	Critical Points for Intervention
<b>Proactive</b>	Provide detailed explanations, engage in collaborative decision-making, offer resources for self-management	Encourage active participation, provide tools for tracking and managing care, connect with peer support and information resources	Initial diagnosis, treatment planning, transitioning to survivorship
<b>Anxious</b>	Offer frequent reassurance, validate emotions, provide clear and concise information	Provide emotional support, connect with mental health resources, offer relaxation and stress-management techniques	Initial diagnosis, treatment planning, induction therapy, hospital discharge, monitoring and follow-up
<b>Acceptance</b>	Use clear, direct communication, focus on actionable steps and realistic expectations	Support in maintaining a sense of normalcy, provide practical resources for managing challenges, encourage a focus on the present	Treatment planning, induction therapy, hospital discharge, consolidation and maintenance therapy
<b>Emotional</b>	Provide empathy and validation, allow ample time for emotional expression, offer coping strategies	Connect with emotional support resources, provide counseling referrals, encourage journaling and other expressive outlets	Initial diagnosis, treatment planning, induction therapy, hospital discharge, monitoring and follow-up, supportive care and survivorship
<b>Uncertain</b>	Offer guidance and decision support, provide clear information, explore options and alternatives	Provide decision-making tools, connect with peer support and information resources, offer ongoing guidance and support	Initial diagnosis, treatment planning, transplant consideration, hospital discharge, monitoring and follow-up, supportive care and survivorship

support needs, as patients grapple with the fear of recurrence, the need for ongoing monitoring, and the task of integrating the cancer experience into their identities and life narratives. Across all stages of the journey, patients require a comprehensive, patient-centered approach to care that addresses their medical, emotional, and social needs. This may include providing clear, understandable information about diagnosis and treatment options, offering psychosocial support and resources for coping, and facilitating communication and decision-making with loved ones and the healthcare team. By

understanding the unique challenges and support needs at each stage of the journey, healthcare providers can tailor their interventions and resources to better meet the needs of individual patients and families.

### Enhancing Patient Care and Support

The mind-set framework offers valuable insights for enhancing patient care and support throughout the leukemia journey (Table 4).

By understanding the unique needs and concerns of each mind-set, healthcare providers can tailor their communication and support

strategies to better meet the needs of individual patients. This may involve providing detailed explanations and resources for Proactive patients, offering reassurance and emotional support for Anxious patients, using clear and direct communication for Acceptance patients, providing empathy and coping strategies for Emotional patients, and offering guidance and decision support for Uncertain patients. As patients progress through treatment, their needs may shift depending on their mind-set and the challenges they face. For instance, Anxious patients may require ongoing reassurance and emotional support during induction therapy and hospital discharge, whereas Acceptance patients may benefit from practical resources for managing side effects and maintaining a sense of normalcy during consolidation and maintenance therapy. The framework also highlights the importance of supporting patients during the transition to survivorship, when they may face new challenges related to long-term side effects, emotional adjustment, and redefining their sense of normalcy. Healthcare providers should be attuned to the unique needs of each mind-set during this stage and provide appropriate resources and support, such as counseling referrals for Emotional patients and peer support connections for Uncertain patients. By using the mind-set framework to guide patient care and support strategies at these critical points, healthcare providers can ensure that patients receive the targeted, personalized support they need to navigate the challenges of the leukemia journey and achieve the best possible outcomes. It is important to note that patients' needs and preferences may evolve over time. Healthcare providers should use the mind-set framework as a starting point for understanding and addressing patient needs but should also remain attuned to the unique experiences and perspectives of each individual. Regular check-ins and ongoing communication with patients can help providers adapt their support strategies as

needed and ensure that patients feel heard, understood, and supported throughout their journey. Tools for assessing patient mind-sets at any point in the journey can make valuable contributions to ensuring that care is patient-centered. These tools are presented next in part IV.

### Tools to Assess Patient Mind-sets and Communicate Properly

This section provides a set of tools and resources to help clinicians assess and respond to patient mind-sets throughout the leukemia journey. The tools are designed to complement the mind-set framework and journey mapping discussed above, offering practical guidance for tailoring communication and support to the unique needs and perspectives of each patient. Section 1 presents the Patient Mind-Set Questionnaire, a simple tool for identifying a patient's primary mind-set at the beginning of their leukemia journey. By asking patients to select the statement that most closely aligns with their thoughts and feelings, clinicians can quickly gain insight into the patient's overall approach to coping with their diagnosis and treatment. The questionnaire is accompanied by a set of instructions for patients and clinicians, as well as a discussion of the potential benefits and limitations of assigning patients to a single primary mind-set (Table 5). Section 2 introduces a stage-specific approach to assessing patient mind-sets throughout the leukemia journey. For each of the 11 stages identified in the journey map, a key question and set of keywords are provided to help clinicians identify the secondary mind-sets that may emerge in response to the unique challenges and priorities of that stage. By listening for these keywords and themes in patient responses, clinicians can gain a more nuanced understanding of each patient's needs and adapt their communication and support strategies accordingly (Table 6).

**Table 5:** The Patient Mind-Set Questionnaire (PMQ) to discover the patient's mind-set.

Patient Mind-Set Assessment Questionnaire	
Which Statement Do You Most Agree With? (Patient)	Mind-Set Assignment Key (Healthcare Staff)
1. I try to focus on the present and take things one day at a time. (Acceptance)	Acceptance
2. I often feel anxious or worried about my leukemia and treatment. (Anxious)	Anxious
3. I need a lot of emotional support to cope with my leukemia journey. (Emotional)	Emotional
4. I prefer to be actively involved in my care and treatment decisions. (Proactive)	Proactive
5. I often feel unsure about my treatment options and what to expect. (Uncertain)	Uncertain
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**Table 6.** Mind-set interview assigner with sample patient reply, keywords important to listen for, and non-verbal cues emerging from observation.

Mind-Set	Sample Patient Reply	Keywords to Listen For	Non-verbal Cues
Proactive	"I like to research my options, ask questions, and work closely with my healthcare team to develop a plan that feels right for me."	research, options, questions, plan, involved, decide, work together	Actively takes notes, asks questions, engages in shared decision-making, maintains eye contact, confident posture
Anxious	"To be honest, I often feel quite overwhelmed and worried. I really need a lot of reassurance and support from my healthcare team and loved ones."	overwhelmed, worried, reassurance, support, anxious, afraid, uncertain	Fidgets, appears restless, seeks frequent reassurance, tense, furrowed brows, worried expression, shaky voice, on the verge of tears
Acceptance	"I try to accept the situation and focus on taking things one day at a time. I trust my healthcare team to guide me through this."	accept, focus, present, day at a time, trust, guide, cope	Appears calm, attentive, nods in understanding, makes statements reflecting acceptance or focus on the present, neutral or slightly positive facial expression
Emotional	"I experience a wide range of emotions and really need help processing my feelings and finding healthy ways to cope with the challenges."	emotions, help, processing, feelings, cope, challenges, support	Cries, expresses strong emotions, seeks physical comfort, expressive, animated facial expressions and hand gestures, difficulty focusing due to emotional state
Uncertain	"To be honest, I often feel quite unsure about what to do. I would really appreciate more information and guidance to help me make decisions about my care."	unsure, information, guidance, decisions, options, clarify, explain	Appears hesitant, indecisive, frequently asks for clarification, puzzled or contemplative facial expression, processes information slowly, struggles to understand



It is important to note that whereas the tools presented here offer a structured approach to assessing patient mind-sets, they should be used as part of a broader, holistic assessment that takes into account each patient's unique background, experiences, and goals. In addition to these mind-set-specific tools, clinicians may also benefit from using more general patient-reported outcome measures and quality of life assessments to gain a comprehensive understanding of each patient's well-being and support needs.

### **Patient Mind-Set Assessment Questionnaire and Assignment Key**

The Patient Mind-Set Questionnaire (PMQ) presented in Table 5 can be used during the initial consultation or early in the patient's leukemia journey to help clinicians understand their primary mind-set and tailor their communication and support strategies accordingly. The PMQ can be incorporated into EHR systems as a standard component of the patient intake/onboarding process and/or as a tool for assessing the patient's mind-set as they go through stages of the journey from diagnosis to survivorship. By take a patient's mind-set "pulse" at various times, healthcare staff can detect mind-set shifts and adjust accordingly to the patient.

Note that during administration of the Questionnaire, the patient sees only the statements. The mind-set assignment is done afterwards, either automatically or manually depending on the mode of administration.

#### *Patient Instructions:*

*"Please read the following statements carefully and select the one that most closely resembles your thoughts and feelings about your leukemia journey. If you feel that more than one statement applies to you, please choose the one that you identify with the most."*

#### *Doctor Instructions:*

*"Provide the Patient Mind-Set Questionnaire to your patient during the initial consultation or early in their leukemia journey. Encourage them to read each statement carefully and select the one that most closely aligns with their thoughts and feelings. If a patient expresses difficulty choosing just one statement, guide them to select the one they identify with the most. After the patient has selected their statement, use the Mind-Set Key to assign the mind-set."*

### **Patient Mind-Set Interview**

The Patient Mind-Set Interview (PMI) presented in Table 6 is a second approach to mind-set identification, envisioned to be used in clinical settings with the patient, and as an adjunct tool with the PMQ. Here the medical professional asks an empathic question directly to the patient. The table provides a sample patient response, keywords and non-verbal cues that can assist medical staff with assigning the patient to a mind-set. The PMI can be used at any time throughout the patient's journey.

*Question: "As we navigate your leukemia journey together, it would be helpful for me to understand how you typically cope with challenging situations. Could you share with me how you usually respond when faced with difficult news or decisions related to your health?"*

Independent of the method used, PMQ or PMI, assigning a patient to their primary mind-set based on the questionnaire can be valuable for clinicians in several ways:

1. **Tailored Communication:** Understanding a patient's primary mind-set allows clinicians to adapt their communication style to best meet the patient's needs. For example, a proactive patient may appreciate detailed information and a collaborative approach, whereas an anxious patient may benefit from reassurance and clear, concise explanations.
2. **Personalized Support:** By identifying a patient's primary mind-set, clinicians can provide targeted support and resources which align with the patient's coping style and emotional needs. This may include connecting patients with relevant support groups, offering tailored coping strategies, or providing additional resources for self-management, respectively.
3. **Anticipating Challenges:** Knowing a patient's primary mind-set can help clinicians anticipate potential challenges or barriers to treatment adherence and enable these to be actively addressed. For instance, an uncertain patient may require more guidance and decision-making support, whereas an emotional patient may need additional emotional care throughout their journey.
4. **Building Trust and Rapport:** By demonstrating an understanding of a patient's primary mind-set and adapting the approach accordingly, clinicians can foster a stronger therapeutic alliance and build trust with their patients. This can lead to improved communication, shared decision-making, and better overall patient satisfaction.

### **Suggestions for Clinical Practice**

1. Incorporate the Patient Mind-Set Assessment Questionnaire into initial patient consultations. The benefits are identified primary mind-sets and tailored communication and support strategies accordingly.
2. Use the stage-specific Patient Mind-Set Assessment Questions and associated keywords to assess secondary mind-sets throughout the leukemia journey, and adapt care plans as appropriate.
3. Provide training for healthcare providers on recognizing and responding to different patient mind-sets to enhance patient-centered care and support.
4. Develop a comprehensive resource library with mind-set-specific support materials, such as coping strategies, educational resources, and referrals to support services.
5. Integrate the mind-set framework into multidisciplinary care team discussions to ensure a consistent, patient-centered approach across all aspects of leukemia care.

### **Discussion**

#### **Implications of the Mind-set Framework for Leukemia Care**

The mind-set framework has significant implications for improving

patient-provider communication, shared decision-making, and psychosocial support in leukemia care. By understanding patient mind-sets and their associated needs and preferences, healthcare providers can engage in more effective, patient-centered communication and collaborate with patients to develop personalized care plans. The framework highlights the importance of tailoring communication and support strategies to the unique needs and perspectives of each patient. For example, patients with a Proactive mind-set may benefit from detailed explanations and collaborative decision-making, whereas those with an Anxious mind-set may require frequent reassurance and emotional support. By adapting their approach to the individual patient, healthcare providers can foster a stronger therapeutic alliance, improve patient satisfaction, and optimize treatment adherence and outcomes. The mind-set framework also emphasizes the importance of providing comprehensive, multidisciplinary support throughout the leukemia journey. This includes addressing patients' medical, emotional, and social needs, and connecting them with appropriate resources and support services. By taking a holistic, patient-centered approach to care, healthcare providers can help patients navigate the complex challenges of the leukemia journey and maintain the best possible quality of life.

### Limitations and Future Research Directions

Whereas this study provides a valuable foundation for understanding patient mind-sets and their implications for leukemia care, it is not without limitations. The mind-set framework was developed through a qualitative, AI-assisted analysis of patient experiences and may require further validation through larger, more diverse patient samples. Future research could explore the application of the mind-set framework to other cancer types and chronic illnesses, as well as the development of specific interventions and tools for assessing and addressing patient mind-sets in clinical practice. Another limitation of this study is its reliance on a single AI language model for the generation and analysis of patient perspectives. Whereas the Claude.ai model provided valuable insights and suggestions, it is important to acknowledge that AI-generated content may not fully capture the complexity and nuance of real patient experiences. Future research could incorporate data from patient interviews, focus groups, surveys or experiments to further refine and validate the mind-set framework. Additionally, the mind-set framework presented in this study is intended as a conceptual tool to understand and address patient needs, rather than a prescriptive or exhaustive classification system. Further research is needed to explore the ways in which patient mind-sets may intersect with other factors such as age, gender, cultural background, and socioeconomic status, as well as develop more nuanced and inclusive approaches to patient-centered care. Despite these limitations, the mind-set framework offers a promising avenue for future research and practice in leukemia care and beyond. By providing a structured approach to understanding and addressing patient needs, the framework can inform the development of targeted interventions, resources, and support services which optimize patient experiences and outcomes. Addressing these limitations through further research will strengthen the framework and its practical applications.

### Conclusions

This study offers a novel framework to understand patient mind-sets and their implications for leukemia care and support. By identifying five key mind-sets (Proactive, Anxious, Acceptance, Emotional, and Uncertain) and mapping the leukemia journey stages, we provide actionable insights into patient experiences, needs, and preferences throughout the leukemia journey. The mind-set framework suggests strategies to tailor communication, support, and care to the unique needs of each mind-set, and highlights critical points for intervention and support. We also propose a set of sample questions and tools for assessing patient mind-sets in clinical practice which can help healthcare providers better understand and address individual patient needs. These findings have significant implications for improving patient-provider communication, enhancing psychosocial support, and optimizing treatment adherence and outcomes in leukemia care. We call for further study to gauge the value of integrating mind-set-based approaches into leukemia care and envision a future in which all patients receive personalized, compassionate, and effective support throughout their cancer journey.

We close with a suggestion for five future directions:

1. Validate the mind-set framework through larger, more diverse patient samples and explore its applicability to other cancer types and chronic illnesses.
2. Develop and test specific interventions and tools for assessing and addressing patient mind-sets in clinical practice, such as mind-set-based communication training programs for healthcare providers.
3. Investigate the impact of mind-set-tailored care on patient outcomes, including treatment adherence, quality of life, and overall satisfaction with care.
4. Explore the potential for technology-based solutions, such as mobile apps or web-based platforms, to support the assessment and management of patient mind-sets throughout the leukemia journey.
5. Conduct longitudinal studies to examine how patient mind-sets may evolve over time and in response to different stages of the leukemia journey and identify factors that contribute to mind-set transitions and adaptations.

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