

# Developing a Mind-Set Framework for Patient-Centered Care on Childhood Obesity, Using AI as a Coach

Stephen D Rappaport<sup>1</sup>, Howard R Moskowitz<sup>2,\*</sup>

<sup>1</sup>Stephen D. Rappaport Consulting LLC, Norwalk, CT, USA

<sup>2</sup>Cognitive Behavioral Insight, LLC, Albany, NY, USA

## \*Corresponding author:

**Howard R Moskowitz**

Cognitive Behavioral Insight, LLC, Albany, NY, USA,  
Phone: 19145721673, **E-mail:** mjihrm@gmail.com

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## ABSTRACT

We present a new approach to understand the topic of childhood obesity, using AI as a guide, and “synthesizing” the specifics. The organizing principle is the hypothesized “journey,” from recognition of the problem to possible solutions. AI creates the steps of the journey, suggests ways to deal with the problem using the concept of “mind-sets,” proposing new tools to recognize issues, and then guides the discussion between the patient and the medical professional. We propose this approach as a tool for the education of medical professionals as a way to focus on how to better understand the mind of patients.

**Keywords:** Artificial Intelligence, Childhood Obesity, Patient Journey, Mind-Set, Synthesized.

## INTRODUCTION

Childhood obesity is a pressing concern with far-reaching implications for the holistic health and well-being of children, encompassing both their physical and mental states. Over the past four decades, there has been a notable rise in the prevalence of childhood obesity on a global scale, as highlighted by the World Health Organization. Childhood obesity has become a pressing issue, with various factors contributing to its rise. These include unhealthy diets that are rich in sugar and processed foods, sedentary lifestyles, limited access to nutritious food choices, and genetic predisposition [1-3].

Children who are overweight often face a multitude of challenges, including both physical and emotional aspects. Individuals in this situation often face challenges such as low self-esteem, negative body image, and social isolation as a result of bullying and discrimination. Furthermore, it is crucial to note that children who are obese face an increased susceptibility to developing significant health complications, including type-2 diabetes, cardiovascular disease, and joint issues, even at a tender age. These health issues can have

significant long-term consequences and greatly impact their overall quality of life throughout adulthood [4-8].

Childhood obesity has far-reaching effects that go beyond just the individual. It has important consequences for healthcare systems and society as a whole. Treating obesity-related health conditions, including doctor visits, medications, and hospitalizations, imposes a significant burden on healthcare systems. In addition, it is important to note that children who are obese have a higher likelihood of developing obesity in adulthood. This not only adds to the burden on healthcare resources, but also contributes to the escalating rates of chronic diseases among the population [9,10].

Childhood obesity is a critical health concern that necessitates the participation of doctors and medical professionals to implement effective intervention strategies. By consulting with healthcare professionals, parents and children can access personalized guidance, assistance, and interventions to effectively address the underlying factors contributing to obesity. Think of this involvement as a journey towards improved health. Medical professionals play the role of knowledgeable guides, equipping you with the information, resources, and strategies needed to navigate the complexities of managing childhood obesity. By conducting regular check-ups, closely tracking progress, and providing tailored recommendations, doctors have the ability to empower families to make lasting lifestyle changes that enhance their overall well-being.

### **The Opportunity Presented by Understanding the Mind of the Child and the Parent**

In order to effectively tackle the issue of childhood obesity, it may be useful to implement personalized management strategies which take into account the specific needs and experiences of the individual patient. Having a deep understanding of patient mind-sets is essential for creating personalized interventions and support systems. This paper introduces a fresh perspective on tackling childhood obesity by utilizing a patient mind-set framework. The framework is developed using structured AI prompting and draws upon the theoretical research of Rappaport and Moskowitz in terms of mind-sets, explicated in the emerging science of Mind Genomics [11-14].

The concepts, patient experiences, choice of language, and evaluation methods explored in this paper are themselves derived from AI-assisted analysis of common patient

encounters and typical clinical situations. This report should be treated as part of the emerging applications of AI as an interface with human being [15,16].

### **METHODS**

In this section, we delve into the patient mind-set framework, which draws upon the emerging science of Mind Genomics, coupled with the notion of a journey. This framework provides valuable insights into the psychological and behavioral aspects of patients grappling with childhood obesity. An exploration into patient mind-sets required a thorough examination of prevalent themes and behavioral patterns found within a diverse dataset encompassing various patient interactions and responses. Every mind-set was carefully crafted to have its own unique characteristics, addressing various aspects of patient experiences [16, 17].

The stages of the patient journey for childhood obesity are presented as a conceptual model, showcasing the typical progression and experiences a patient may undergo instead of a rigid clinical pathway. It should be noted that this conceptual model emerged from a combination of personal experiences of the senior author, SR, along with observations and common scenarios seen in clinical practice. The actual approach uses a set of prompts to AI (Claude, Sonnet). The prompts themselves are structured to generate information that would be asked of the patient and based upon the personal experience of author Rappaport. The prompts were developed for the Sonnet version from Claude. A demonstration of the approach can be found at: <https://youtu.be/9kk0P6ZfNIA?si=GfYShmuCGa7QusP8> [18,19].

### **RESULTS**

#### **Mind-Sets**

The mind-set of a patient is a key factor in determining their overall health and well-being. Our understanding of a mind-set encompasses an individual's beliefs, attitudes, and perceptions regarding their own health, illness, and treatment. Having a positive mind-set can have a significant impact on the patient's physical well-being, boosting motivation, strengthening resilience, and enhancing the capacity to overcome challenges. In contrast, a pessimistic outlook can impede forward momentum and potentially worsen health conditions. Understanding the mind-set of patients is crucial for healthcare professionals, allowing the professionals to deliver personalized care appropriate to the patient's specific needs [15,20-23].

Table 1 shows the various mind-sets synthesized by AI, focusing directly on children who are dealing with obesity. Table 1 shows columns presenting information about the mind-sets: mind-set name, attitudes, emotional responses, behaviors, and non-verbal cues.

1. People in the “Overwhelmed” mind-set may encounter difficulties when it comes to initiating and maintaining lifestyle changes. They could definitely use some additional assistance and encouragement.
2. People in the “Determined” mind-set are more likely to be receptive to interventions and actively engage in their treatment plan.

3. People in the “Shame” mind-set might benefit from a compassionate and empathetic approach that recognizes the emotional aspects of their situation.
4. People in the “Skeptical” mind-set value the importance of building trust and providing evidence-based information to promote patient engagement.
5. People in the “Supported” mind-set can find value in working together and using empowering strategies to tap into their existing motivation.

**Table 1.** The mind-sets synthesized by AI for childhood obesity

	MIND-SET	ATTITUDES	EMOTIONAL RESPONSES	BEHAVIORS	NON-VERBAL CUES
1.	<b>OVERWHELMED</b>	Helpless, defeated	Anxiety, frustration	Avoidance, procrastination	Slumped posture, averted gaze
2.	<b>DETERMINED</b>	Optimistic, motivated	Confidence, enthusiasm	Active engagement, goal-setting	Upright posture, direct eye contact
3.	<b>ASHAMED</b>	Self-critical, embarrassed	Guilt, shame	Secretive behavior, social withdrawal	Hunched posture, fidgeting
4.	<b>SKEPTICAL</b>	Doubtful, resistant	Suspicion, apprehension	Questioning, challenging advice	Crossed arms, furrowed brow
5.	<b>SUPPORTED</b>	Encouraged, hopeful	Gratitude, relief	Seeking help, following recommendations	Relaxed posture, smiling

### The “Patient’s Journey”

It can be enlightening to lay out the patient's journey, from the first signs of symptoms to the final outcome. By recognizing and formalizing the patient's experience throughout their medical journey, practitioners can gain valuable insights into how their decisions and interventions affect the patient's well-being. Having a good grasp of the patient's journey may end up assisting healthcare providers to customize their approach to each patient, by recognizing the stages and merging that understanding with mind-sets. Table 2 presents the different aspects of the five major stages in the patient journey.

By formalizing the patient journey and incorporating patient feedback into practice, healthcare providers can strive to regain the patient-centricity that is crucial in modern medicine. Standardizing this knowledge can create an educational tool for aspiring professionals, aiding them in gaining a more profound comprehension of the intricacies of patient care and the significance of prioritizing the needs of the patient. Through attentive listening to patient experiences and feedback,

healthcare providers can gain a deeper understanding of the emotional and psychological dimensions of illness and treatment. This knowledge helps the cultivation of empathy and compassion for patients, enhancing patient-focused care.

1. The Diagnosis stage plays a vital role in identifying obesity and the potential health risks that come with it, laying the groundwork for the following stages.
2. The Education stage provides patients and families with valuable information about the condition, helping them make well-informed decisions.
3. The Planning stage entails creating a customized treatment plan that caters to the individual's specific needs and preferences, encouraging a sense of personal investment and dedication.
4. The Implementation stage can be quite demanding and time-consuming, as it requires ongoing dedication and assistance to sustain lifestyle modifications.

5. Ultimately, the Monitoring stage is crucial for continually evaluating progress, making necessary adjustments, and providing ongoing support to maintain lasting achievements.

**Table 2.** The five major stages of the patient’s journey

JOURNEY STAGE	DESCRIPTION	DURATION
1. <b>DIAGNOSIS</b>	Initial identification of obesity and associated health risks	1-2 weeks
2. <b>EDUCATION</b>	Learning about the causes, consequences, and management of obesity	2-4 weeks
3. <b>PLANNING</b>	Developing a personalized treatment plan with lifestyle modifications	2-4 weeks
4. <b>IMPLEMENTATION</b>	Initiating and maintaining lifestyle changes, including diet and exercise	6-12 months
5. <b>MONITORING</b>	Regular check-ins to assess progress, adjust plans, and provide support	Ongoing

**Supporting Language for the Mind-Set at the Different Stages of the Patient’s Journey**

Table 3 provides suggestions by AI, of the language which might be “best” for the patient. Once again, it is important to recognize that the structure is based upon the vast amount of information available to the LLM, the large language model, used to synthesize the mind-sets. With that caveat, Table 3 can provide suggestions about the most relevant words to use. Through the strategic use of both formal and informal language, healthcare professionals can provide personalized support and motivation which resonates with individuals at different stages of their journey.

1. People who approach the Diagnosis stage feeling overwhelmed may find reassurance and support systems to be helpful.
2. People who have a blend of scholarly and creative skills, and a talent for persuasive writing, can find inspiration during the Implementation phase by acknowledging their relentless drive and providing uplifting words to fuel their efforts.
3. Throughout the Monitoring stage, it is beneficial to encourage patients to redirect their attention from momentary setbacks to their overall progress. Highlighting their accomplishments can be helpful in shifting away from a mind-set of shame. A thoughtful and adaptable approach involves appreciating and taking into account patient feedback and being willing to modify plans accordingly.
4. Ultimately, those who embrace a “Supported” mind-set can discover empowerment in recognizing their proactive role in maintaining their well-being.

**Table 3.** Language which might be “best” for the patient, for each mind-set, at each stage of the patient’s journey

JOURNEY STAGE	MIND-SET	BEST WORDS TO HELP PATIENT
<b>DIAGNOSIS</b>	Overwhelmed	“We’re here to support you every step of the way.”
	Determined	“Together, we can create a plan to improve your health.”
	Ashamed	“This is a common challenge, and it’s not your fault.”
	Skeptical	“I understand your concerns; let’s discuss the evidence.”
	Supported	“You’re taking an important first step towards better health.”

EDUCATION	Overwhelmed	"We'll break down the information into manageable parts."
	Determined	"Learning about your condition empowers you to take control."
	Ashamed	"Seeking knowledge is a sign of strength, not weakness."
	Skeptical	"I encourage you to ask questions and voice your doubts."
	Supported	"We're here to provide the resources you need to succeed."
	Overwhelmed	"Let's focus on small, achievable goals to build momentum."
PLANNING	Determined	"Your input is crucial in creating a plan that works for you."
	Ashamed	"This plan is about promoting health, not passing judgment."
	Skeptical	"We can adjust the plan as needed based on your feedback."
	Supported	"Together, we'll develop a roadmap for your success."
	Overwhelmed	"Remember, progress is more important than perfection."
	Determined	"Your dedication is inspiring; keep up the great work!"
IMPLEMENTATION	Ashamed	"Setbacks are normal; what matters is how you respond."
	Skeptical	"Let's discuss any challenges and find solutions that work for you."
	Supported	"You're making positive changes that will benefit your health."
	Overwhelmed	"We're here to help you navigate any obstacles that arise."
	Determined	"Your consistent efforts are paying off; let's keep the momentum."
	Ashamed	"Focus on the progress you've made, not temporary setbacks."
MONITORING	Skeptical	"Your feedback is valuable in refining our approach."
	Supported	"You're taking control of your health, and that's commendable."

**Assessing Patient Mind-Sets in Childhood Obesity: Tools and Strategies for Personalized Support**

An understanding of the patient's journey is essential for delivering personalized and impactful healthcare. A commonly used tool to obtain this information is through

a questionnaire which gathers details about the patient's medical background, current symptoms, and treatment preferences. The questionnaire makes it possible for healthcare providers to collect this information in a structured manner. Another important tool for gaining insight into the patient's journey is a form that can facilitate a meaningful conversation.

This form, which serves as our second tool, enables healthcare providers to establish a connection with patients, understand and relate to their experiences, and obtain valuable insights into their overall health and emotional state. Through open dialogue, healthcare providers have the opportunity to address concerns, clarify treatment goals, and actively involve patients in the decision-making process. This tool promotes a collaborative and patient-centered approach to care, enhancing the overall patient experience and improving

health outcomes [24-26].

Table 4 shows part of the proposed structure of the Patient Mind-Set Questionnaire (PMSQ). The questionnaire includes a set of statements related to each mind-set, which patients can rate on a scale of 1 to 5 to express their level of agreement. The PMSQ can be used at different stages of the patient journey to monitor shifts in mind-set over time.

**Table 4.** Part of the Patient Mind-Set Questionnaire (PMSQ) as synthesized by AI

Mind-Set	Statement	Rating (1-5)
<b>Overwhelmed</b>	I feel helpless in managing my child's weight.	-
<b>Determined</b>	I am committed to making lifestyle changes for my child's health.	-
<b>Ashamed</b>	I blame myself for my child's weight issues.	-
<b>Skeptical</b>	I doubt that the proposed treatment plan will work for my child.	-
<b>Supported</b>	I feel encouraged by the support from the healthcare team.	-

Table 5 shows the Patient Mind-Set Interview (PMSI), a versatile interview guide which combines elements of academia and casual conversation. The PMSI tries to shed light about the patient's thinking by using open-ended questions and driving attentive listening. The interviewer poses questions which encourage the patient's parent to openly discuss

their experiences, attitudes, and coping strategies regarding their child's obesity. The PMSI allows for a more in-depth exploration of patient mind-sets and provides an opportunity for healthcare professionals to build rapport and trust with patients.

**Table 5.** The format of the Patient Mind-Set Interview (PMSI)

Mind-Set	Sample Patient Reply	Keywords To Listen For	Non-Verbal Cues
<b>Overwhelmed</b>	"I feel like I've tried everything, and nothing seems to work."	"Tried everything," "Nothing works"	Slumped posture, sighing
<b>Determined</b>	"I know it won't be easy, but I'm ready to do what it takes."	"Ready," "Do what it takes"	Upright posture, nodding
<b>Ashamed</b>	"I feel like I've failed as a parent."	"Failed," "Bad parent"	Averted gaze, fidgeting
<b>Skeptical</b>	"I've heard these promises before, and they never pan out."	"Heard before," "Never pan out"	Crossed arms, raised eyebrows
<b>Supported</b>	"Knowing that I have a team behind me makes all the difference."	"Team," "Makes a difference"	Smiling, relaxed posture

## How Can We Incorporate the Patient Mind-Set Framework into Current Obesity Prevention and Management Programs to Make Them More Effective?

1. By incorporating the Patient Mind-Set Questionnaire (PMSQ) and Patient Mind-Set Interview (PMSI) into the initial assessment process of obesity prevention and management programs, it is possible to gain insight into the dominant mind-set of each patient. The outcome is information that can be used to tailor the program's approach, resources, and support to better match the patient's needs and perspectives.
2. Establishing Individualized Objectives: By integrating the patient mind-set framework into goal-setting and treatment planning, it may be more likely to create objects which are realistic, achievable, and genuinely significant to the patient. Knowing the mind-set of the patient allows programs to set goals that resonate with them, increasing their motivation and commitment to the process.
3. Good communication is crucial for educational materials, counseling sessions, and support groups. A blend of formal and informal language may increase the likelihood that the information and advice will have an impact. A mix of academic and casual language, along with effective copywriting techniques, may increase understanding, motivation, and dedication to the recommended changes in lifestyle.
4. Monitoring Progress: It is crucial to evaluate the mind-set of patients during the program in order to monitor any shifts in attitudes and behaviors over time, and in a consistent manner. This information can be used to adjust the approach as needed, ensuring that the support provided remains relevant and effective for each person.
5. Staff Training: Providing training to program staff on the patient mind-set framework can improve their ability to recognize and address different mind-sets when interacting with patients. This ability to "recognize and address" may increase the emphasis on empathy and patient-centered care, ultimately improving outcomes.

### Suggestions for Applying the Patient Mind-Set Framework to Developing Countries

When incorporating the patient mind-set framework into obesity prevention and management programs, one should

take into account the specific challenges and cultural contexts of developing countries.

1. Consider the diverse cultural backgrounds of patients and adapt communication strategies accordingly. Take into account the local beliefs, values, and norms in order to ensure that our interactions are culturally appropriate and sensitive. Work alongside healthcare professionals, community leaders, and patients. This effort should reduce cultural barriers or misunderstandings which may arise.
2. Involve the wider community in initiatives aimed at preventing and addressing obesity. By incorporating the patient mind-set framework into community-based programs such as school initiatives or religious organizations, one is likely to cultivate a supportive atmosphere which fosters and reinforces beneficial lifestyle modifications.
3. Develop capacity by training local healthcare professionals and community health workers on the patient mind-set framework. The training enhances their skills/ knowledge and increases their motivation, both ensuring the long-term effectiveness of the approach in developing nations. The effort may necessitate updating training materials, offering continuing support and guidance, and promoting a patient-centered environment within the healthcare system.
4. Integrate the effort with existing programs. The constraints presented by resource-limited settings may necessitate that the patient mind-set framework be integrated into existing health programs such as maternal and child health services or non-communicable disease management. The integrating may be easier financially and culturally, and thus represent a better strategy than the "head-on" creation of programs specifically for obesity prevention and management. This approach optimizes the efficiency of the framework while minimizing any extra expenses and resources.

By taking into account these valuable insights and tailoring the patient mind-set framework to suit the specific needs and situations of developing countries, we can enhance the effectiveness, accessibility, and sustainability of obesity prevention and management programs in these settings.

## DISCUSSION AND CONCLUSIONS

The patient mind-set framework offers a fresh and promising approach to advancing personalized care for childhood obesity. By understanding and addressing the unique perspectives, attitudes, and behaviors of patients, healthcare professionals can develop tailored interventions that promote better engagement, adherence, and ultimately, improved health outcomes. The focus on empathy, collaboration, and patient empowerment is in line with the principles of patient-centered care and has the potential to revolutionize the management of childhood obesity.

Future research should focus on validating the patient mind-set framework in clinical settings, assessing its impact on patient satisfaction, treatment adherence, and long-term health outcomes. In addition, it would be interesting to see how the framework can be applied to different chronic diseases and medical scenarios, as this could expand its usefulness and positively impact a larger group of patients. The development of digital tools and applications that incorporate the patient mind-set framework is another promising avenue for future research, as it could enhance the accessibility and efficiency of personalized care delivery.

**Implications of the Framework:** The approach to tackling childhood obesity has significant implications for improving treatment adherence and ensuring patient satisfaction. By understanding the perspectives and needs of their patients, healthcare professionals have the ability to develop tailored interventions which resonate with each person. This unique approach has the potential to boost engagement, motivation, and ultimately, achieve more successful outcomes in tackling childhood obesity.

**Digital Assessment Tools:** These tools can greatly streamline the assessment process, making it more convenient and effective for patients and healthcare professionals alike. Digital platforms provide ongoing support, resources, and progress tracking, enabling parents to effectively manage their child's obesity.

**Limitations of the Framework:** The framework is constructed based on theoretical perspectives about mind-sets and patient journeys. This synthesized structure may not capture all the complexities and variations encountered in real-life situations. Moreover, it's important to thoroughly research and validate the effectiveness of the framework as it impacts the patient outcome.

Ten directions suggested for further exploration:

1. The effectiveness of the patient mind-set framework in clinical settings by conducting randomized controlled trials
2. How the framework affects patient satisfaction, treatment adherence, and long-term health outcomes in childhood obesity
3. How the framework can be applied to various aspects of childhood obesity, including prevention, early intervention, and long-term maintenance
4. Create and assess digital tools and applications that integrate the patient mind-set framework for managing childhood obesity.
5. Combine the patient mind-set framework with other evidence-based approaches, like motivational interviewing and cognitive-behavioral therapy.
6. Determine how the framework can accommodate different cultures and environments, considering their unique needs and characteristics.
7. Refine patient mind-sets and journey stages through qualitative research, drawing insights from real-world patient experiences and feedback.
8. Compute financial impacts of incorporating the patient mind-set framework into different healthcare environments.
9. Determine the potential for medicine by incorporating the mind-set framework into the treatment of chronic diseases and its impact on medical scenarios for indications beyond childhood obesity.
10. Use the framework to shape public health policies and interventions targeting childhood obesity on a larger scale.

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