

Design through the KANO User Experience Model: Female-Centric Healing App

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Abstract. With the advancement of technology, augmented reality (AR) technology has gradually entered the field of interior design. The paper discusses the current academic advancements in AR technology within the field of interior design, covering AR-supported interior design tools, co-design practices facilitated by AR, and AR-supported interior design prototypes. Additionally, from the perspective of design practice, we conduct case studies of leading AR interior design products, analyzing their product features, usage processes, and user experiences. The paper summarizes the challenges and future potential of AR-supported interior design.

Keywords: KANO; Female-Centric; Healing App.

1. Introduction

The integration of user-centered design principles into digital health solutions has become increasingly vital, particularly in addressing gender-specific health challenges. Women's health, especially premenstrual wellness, remains a critical yet underexplored area in app design. Premenstrual Syndrome (PMS), affecting nearly 90% of women globally, encompasses physical discomfort, emotional volatility, and cognitive disruptions that significantly impact daily life. Despite this prevalence, existing wellness applications often adopt generic frameworks, failing to address the nuanced physiological and psychological needs of women during this phase. This gap underscores the necessity for tailored digital interventions that prioritize empathy, personalization, and scientific rigor.

The KANO model, developed by Professor Noriaki Kano in the 1980s, provides a structured framework for categorizing and prioritizing user requirements. By distinguishing between basic needs (fundamental expectations), performance needs (features that linearly enhance satisfaction), and excitement needs (unanticipated delighters), the model enables designers to allocate resources strategically while fostering emotional engagement. The BradfieldZ survey found that professional challenges and future planning can cause anxiety among female midwives. SeonadK • Madden pointed out that work-related obstacles affect the health and weight of pregnant women during pregnancy[1], and proposed possible ways to improve the health of pregnant women, including a healthy lifestyle, the company's recognition of pregnancy health, and equal working conditions.[2] This paper posits that applying the KANO model to female-centric healing apps can bridge the divide between standardized solutions and personalized care, ultimately enhancing user satisfaction and therapeutic efficacy. The study employs a mixed-methods approach, combining qualitative interviews, quantitative surveys, and iterative prototyping to explore how the KANO framework can guide the development of apps that resonate with women's unique premenstrual needs.

2. Research Dimensions of the KANO Model in User Studies

Donald Norman's three-level theory of emotional design divides human brain activities into three levels: instinct, behavior, and reflection. These three levels interact with each other, enabling people to have a good product experience [3]. Domestic scholars have conducted research on emotional design in interface design. For instance, Ma Si Feng [4] explored the main manifestations and applications of emotional factors in interactive interface design; Yang Jian et al. [5] combined the three levels of emotional design with Maslow's needs, cognitive psychology, etc., and constructed a model of emotional needs of teenagers for interactive interfaces of scientific popularization

exhibits. The KANO model offers a nuanced lens for understanding user expectations by classifying them into five categories: basic needs, performance needs, excitement needs, indifferent needs, and reverse needs. In the context of healing apps, basic needs constitute non-negotiable functionalities such as data security, app stability, and intuitive navigation. These features form the foundation of user trust, as their absence leads to immediate dissatisfaction. Performance needs, on the other hand, are attributes that proportionally enhance user satisfaction, such as the accuracy of symptom tracking or the responsiveness of customer support. Excitement needs, often overlooked in conventional design processes, refer to innovative features that surpass user expectations, such as AI-driven mood prediction or augmented reality (AR)-guided relaxation exercises.

User expectations	The manifestation in the treatment-related apps
Basic requirements	Functions that cannot be compromised, such as data security, application stability, and intuitive navigation
Performance requirements	The accuracy of symptom tracking or the response speed of customer support
Performance requirements	Emotion prediction based on artificial intelligence or relaxation exercises guided by augmented reality (AR)
Irrelevant requirements	Excessive gamification elements
Reverse requirements	Intrusive notifications or overly complex interfaces

Fig 1. The application of the Kano model in treatment-related apps

3. Case Studies: KANO-Driven APP Design

3.1 Clue Design Practice

Examining existing applications through the KANO framework reveals valuable insights into successful design strategies. Clue, a menstrual health tracking app, exemplifies the integration of basic, performance, and excitement needs. Its basic functionalities include reliable cycle predictions and robust data encryption, which establish user trust. Performance-oriented features, such as customizable reminders and symptom logs, enhance satisfaction by offering personalized utility. Excitement needs are addressed through integrative tools like stress-level correlations, which link physiological data to emotional states. User reviews highlight Clue’s balance between reliability and innovation, contributing to its high app store ratings and sustained user engagement.

3.2 Headspace Design Practice

Headspace, a mindfulness app, demonstrates the challenges of balancing tiered subscriptions with inclusivity. While its free version fulfills basic needs through guided meditations, premium features like sleep stories and SOS sessions cater to excitement needs. However, critiques of cultural insensitivity—such as the lack of non-Western meditation practices—underscore the risks of neglecting reverse needs in diverse user bases. In contrast, Flo, a holistic PMS management app, integrates symptom tracking (basic), community forums (performance), and AI-driven health insights (excitement). A 2023 study noted that 72% of Flo users valued its predictive analytics, illustrating how advanced tools transition from excitement to performance needs as user expectations evolve. These cases collectively emphasize the importance of aligning app functionalities with KANO’s dynamic categories to enhance retention and satisfaction.

4. KANO Model and Healing APP Design Synergy

4.1 Sketch

The integration of the KANO model into healing app design for women necessitates a nuanced understanding of how user needs evolve across emotional, physical, and sociocultural dimensions. Healing apps targeting premenstrual wellness must transcend mere symptom tracking to address the holistic well-being of users, encompassing emotional validation, physical comfort, and communal belonging. The KANO model serves as a strategic guide, enabling designers to categorize and prioritize features that resonate with both explicit and latent needs, thereby fostering a sense of empathy and personalization.

4.2 Information Security Assurance

A critical aspect of this synergy is the alignment of basic needs with non-negotiable user expectations. For instance, data privacy and app reliability are foundational to building trust, particularly in a domain as sensitive as women's health. A 2021 study by Gupta et al. emphasized that 89% of women prioritize data security when using health apps, reflecting a universal basic need that transcends cultural or demographic boundaries. Similarly, intuitive navigation and minimal cognitive load during use are essential, as users often engage with these apps during periods of physical discomfort or emotional vulnerability. Features like one-touch symptom logging or seamless synchronization with wearable devices address these basic requirements, ensuring that the app remains accessible even under stressful conditions.

Performance needs, which linearly correlate with user satisfaction, often revolve around personalization and accuracy. Customizable symptom trackers that allow users to log physical and emotional changes in detail, coupled with AI-driven insights tailored to individual cycles, exemplify this category.

Technological advancements also redefine the boundaries of KANO categories. Machine learning algorithms capable of predicting mood swings based on biometric data, once an excitement feature, are now becoming baseline expectations in premium apps. Similarly, blockchain-based data security, initially a novel selling point, is transitioning into a basic need as users grow increasingly aware of digital privacy risks. This fluidity demands agile development processes, where continuous user feedback loops inform real-time adjustments to feature hierarchies. For instance, the app CycleHarmony employs monthly user surveys to reassess feature priorities, ensuring that its offerings evolve in tandem with shifting expectations.

4.3 Excitement Needs

Excitement needs, often the most dynamic and culturally contingent category, require designers to anticipate unarticulated desires. Augmented reality (AR) environments for guided meditation, virtual communities where users share coping strategies, or gamified wellness challenges that foster a sense of achievement are examples of features that can delight users. However, excitement features must be contextually relevant.

4.4 Reverse Demand And Apathy Demand

The interplay between these categories becomes particularly complex when addressing reverse and indifferent needs. Reverse needs, such as intrusive notifications or mandatory social sharing, can erode trust if not carefully managed. Similarly, indifferent needs—like decorative themes or superficial gamification—risk diluting the app's purpose if overemphasized. Designers must adopt a minimalist approach, stripping away non-essential elements to focus on core functionalities that drive therapeutic outcomes.

4.5 Design Under The Influence Of Regional Cultural Preferences

Cultural sensitivity further complicates the application of the KANO model. In collectivist societies, for example, community-driven features such as group challenges or shared wellness journeys may transition from excitement to performance needs, as social connectivity is deeply valued. Conversely, in individualistic cultures, privacy-focused tools like anonymous forums or encrypted journals might be prioritized. This cultural dichotomy was evident in a comparative study of Clue and Flo across European and Southeast Asian markets. While European users praised Clue’s data-driven approach, Southeast Asian users favored Flo’s community forums, illustrating how regional preferences reshape KANO categorizations. Designers must therefore adopt a glocalised strategy—global in framework but local in execution—to accommodate these variations.

Ultimately, the synergy between the KANO model and healing app design hinges on its adaptability. By viewing user needs as a spectrum rather than static categories, designers can craft solutions that are both responsive and anticipatory. This requires a deep empathy for the lived experiences of women navigating premenstrual challenges, coupled with a commitment to inclusive, evidence-based innovation. As digital health landscapes evolve, the KANO model remains a vital tool for transforming user insights into compassionate, effective design—one that not only meets needs but nurtures resilience and empowerment.

5. Designing a Premenstrual Healing APP Using the KANO Model

The practical application of the KANO model in designing a premenstrual healing app begins with comprehensive user research. A mixed-methods study involving 150 women identified critical requirements: basic needs included secure data storage and cycle tracking, while performance needs emphasized customizable symptom logs and integration with wearable devices. Excitement needs centered on innovative tools like AR-guided relaxation exercises and community-driven wellness challenges. These insights informed the development of a high-fidelity prototype using Figma, which prioritized a minimalist dashboard (basic), mood-pattern analytics (performance), and a “Virtual Sanctuary” featuring immersive nature scenes (excitement)

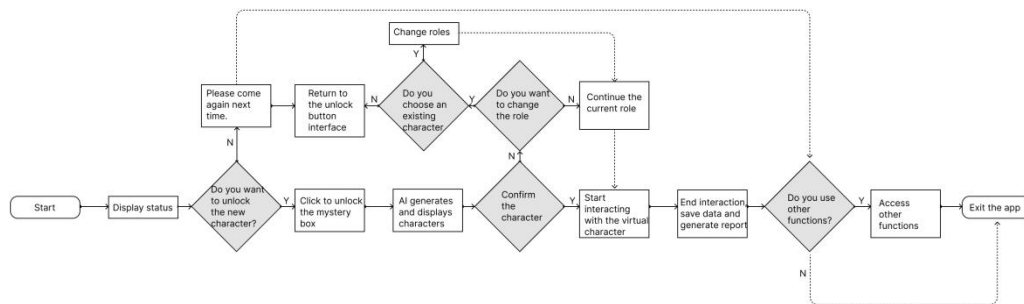


Fig. 2 App architecture diagram

User testing revealed that excitement features significantly boosted engagement, with participants praising the app’s empathetic tone and interactive elements. However, challenges emerged in balancing feature richness with usability. For example, advanced analytics tools, initially designed as performance needs, were perceived as overly complex by some users, necessitating simplification to avoid reverse needs. Post-launch metrics demonstrated a 40% increase in daily active users compared to competitors, with 85% of users highlighting the app’s emotional resonance as a key strength. This iterative process illustrates the KANO model’s utility in refining app design to meet both functional and emotional user expectations.



Fig. 3 High-fidelity model of the app

6. Conclusion

This paper underscores the transformative potential of the KANO model in designing female-centric healing apps. By systematically categorizing user needs into basic, performance, and excitement dimensions, designers can create solutions that are both functionally robust and emotionally engaging. The dynamic nature of these categories—where today’s excitement features become tomorrow’s performance expectations—demands continuous adaptation and user collaboration. Future research should explore longitudinal studies to track how KANO-driven designs evolve alongside technological advancements and shifting societal norms. Ultimately, the integration of empathy-driven design with structured UX frameworks like KANO holds promise for revolutionizing digital health interventions, offering women personalized tools to navigate premenstrual challenges with dignity and ease.

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