Exploring the Emotion-Information Behavior Interaction in Preoperative Communication: A Phenomenographic Study and Design Strategies

Yuanyuan Kang* and Jingxian Xu

Nanjing University of Science and Technology, 210094, Nanjing, China

*kangyy-vera@njust.edu.cn

Abstract. Objective:From the perspective of patient psychology and communication behavior, this study aims to analyze the characteristics of the interaction between patient emotions and communication behaviors in preoperative consultations, revealing their underlying mechanisms.

Methods:Through in-depth interviews, we collected real-world cases of emotion-communication behavior interactions during preoperative discussions. Using a phenomenographic-inspired approach, we extracted correlations between individual emotional states and communication behaviors, followed by an in-depth exploration of their dynamic interplay.

Conclusions:By applying phenomenography to preoperative communication research, this study identified multiple interaction patterns between emotions and communication behaviors. Emotions trigger diverse communication actions, such as information-seeking and opinion-sharing, fostering deeper dialogue. Simultaneously, communication methods, content, and outcomes significantly influence emotional states. From the perspective of individual patient experiences, the symbiotic relationship between emotions and communication behaviors provides medical teams and communication designers with a more holistic framework—particularly in addressing emotional contexts and lived experiences—offering actionable insights for optimizing preoperative communication strategies.

Keywords: Preoperative Communication, Patient Emotions, Communication Behaviors, Design Strategies

1 Introduction

In the context of the new media era, doctor-patient communication and user behavior characteristics in health science have attracted growing academic attention, with the aim of better understanding users and ensuring effective acquisition and utilization of health information[1]. As a core component of human psychological activities, emotion represents an individual's attitudinal experience and corresponding perceptual response to objective stimuli, playing a significant guiding role in rational decision-making and individual behavior[2].

B. Majoul et al. (eds.), *Proceedings of the 2025 11th International Conference on Humanities and Social Science Research (ICHSSR 2025)*, Advances in Social Science, Education and Humanities Research 945,
https://doi.org/10.2991/978-2-38476-440-2_145

Recent years have witnessed a paradigm shift in healthcare communication and health engagement research - from a system-centered to a user-centered approach - with increasing focus on how affective factors influence users' information behavior and health-related actions. However, current studies remain constrained by two major limitations: first, they predominantly examine behaviors under static, discrete emotional categories[3]; second, they tend to investigate emotions' unidirectional impact on singular behavioral outcomes[4]. This leaves a critical research gap in understanding the dynamic, reciprocal relationships between emotions and information/health behaviors from the perspective of lived individual experiences.

This creates a crucial gap in understanding emotion-behavior dynamics through lived experiences. Our study addresses this by phenomenologically examining real-world interactions between emotions and information/health behaviors, focusing on: (1) emotion-driven behavior patterns, (2) behavioral impacts on emotional trajectories, and (3) individual perception differences.

Using phenomenography, we analyze preoperative emotion-information behavior interactions through patients' cognitive-emotional experiences. The results reveal actionable patterns to enhance communication design and patient support, while advancing theoretical understanding of these Preoperative Communication interactions.

2 Research

2.1 Preoperative Communication: Information Behaviors and Emotions

Preoperative communication features dynamic emotion-information interactions. Emotional states (anxiety, fear, hope, relief)[5] shape patient engagement with surgical information, while information clarity affects emotions, creating a unique feedback loop[6]. Current research often overlooks these bidirectional effects in preoperative decision-making.

Using phenomenography, we examine: (1) emotion-driven information behaviors and (2) their impact on emotional regulation. The study develops a preoperative interaction model and practical strategies to optimize information delivery and educational materials, enhancing surgical readiness.

2.2 Emotions and Information Behavior: A Phenomenographic Perspective

Measuring emotions in preoperative consultations is crucial yet difficult, as they shape lasting patient memories. Self-reports effectively capture clinician and patient emotions, with real-time data being most reliable during critical moments like risk discussions[7]. The emotion-information behavior connection strengthens assessment accuracy in these high-stakes interactions[8], where patient anxiety may impair understanding while clinician stress affects explanation quality.

Developed at Gothenburg University, phenomenography analyzes[9] preoperative communication variations by: (1) linking emotions to information perception, (2)

pinpointing communication gaps, and (3) creating "outcome spaces" through interviews, bridging objective and subjective experiences.

2.3 Design for Preoperative Communication

Current preoperative tools (flowcharts, videos, manuals) improve understanding but often ignore emotional impacts[10]. Flowcharts may increase anxiety, while videos can overwhelm. High costs and inflexible designs limit use, and they fail to address how emotions like anxiety distort information processing.

Online platforms and AI Q&A enhance efficiency but lack emotional intelligence[11]. AI cannot detect anxiety, and standardized content doesn't adapt to emotional states. Anxious patients fixate on risks, while discouraged ones disengage, reducing compliance.

3 Methods

This study used phenomenography[9], combining interviews and observations in three phases: (1) in-depth interviews with physicians and patients, (2) structured field observations of Preoperative Communication interactions, and (3) phenomenographic analysis of experience patterns. This integrated approach ensured methodological rigor through data triangulation.

3.1 Interview Process and Outline

Using phenomenography, we interviewed 6 physicians and 6 patients about emotion-information interactions during key preoperative discussions (e.g., risk disclosure). Analysis identified unique behavior patterns and developed an outcome space for effective information exchange. (full interview outline detailed in Table 1).

Table 1. Interview Process and Outline

Interview Process	Interview Content	Research Objectives
1	"Please recall the most memorable moment from your recent preoperative consultation."	To elicit emotionally salient memories
2	For doctors: "What was your emotional state after hearing the patient's initial concerns?" For patients: "How did you feel immediately after expressing your concerns?"	To identify baseline emotional states
3	For doctors: "When you detected the patient's anxiety/concerns, did this prompt you to modify your information delivery? Please provide examples (e.g., retrieving consent forms, manuals, visual aids, or statistical explanations)."	To examine emotion-driven information behaviors

	For patients: "While experiencing these emotions, did they lead you to seek or avoid certain information? Please describe specific actions you took."	
4	"After this information behavior occurred, did your emotional state change compared to before this action?"	To assess behavioral feedback on emotions
5	"Can you describe this emotional change in detail?"	To capture individual experiential variations
6	"How do you interpret this emotion-behavior interaction? Why do you think such emotional changes occurred?"	To explore conceptual diversity in understanding mechanisms

3.2 Analysis of Interview Corpus

Sjöström and L.O. Dahlgren's phenomenographic approach to analyze interview data[12], we analyzed interview data through: (1) thematic coding, (2) achieved 83.3% inter-coder agreement (Holsti's formula, Cohen's κ=0.76),, and (3) contrastive analysis mapped to their outcome space framework.

3.3 Types of Information Behavior in Interview Corpus

Emotions shape information behaviors in clinical communication: anxious patients seek more details, while doctors offer explanations or visual aids (diagrams/videos). We categorize these as acquisition, sharing, and expression. Follow-up questions or educational material exchanges represent emotion-facilitated derived behaviors. Visual aids boost comprehension and acceptance.(Analysis of information types: Patient in Table 2, Physician data in Table 3.).

Table 2. Analysis of Information Behavior Types(Patient)

Interview Corpus	Coding Result
"When I noticed my mole had enlarged, I felt uneasy and searched online for causes, surgical indications, and risks."	Information Acquisition
"After reading an educational article about mole excision on the hospital's official account, I forwarded it to my family to discuss whether I needed surgery."	Information Sharing
"The doctor showed me an illustration of the excision procedure, which clarified the process and helped me decide to proceed."	Information Expression
"Though the doctor explained the treatment plan, I later consulted a medical student friend to discuss its feasibility."	Information Exchange (derived from Sharing)
"Concerned about postoperative recovery, I shared the doctor's care instructions in our family group to plan logistics."	Information Exchange (derived from Expression)

Table 3. Analysis of Information Behavior Types(Physician)

Interview Corpus	Coding Result
"The patient showed excessive concern about surgical risks, so I explained the success rate and complication probabilities to help them evaluate more objectively."	Information Provision
"Noticing the patient's worry about their mole changes, I explained malignant transformation risks and surgery necessity, recommending our hospital's official account for further information."	Information Sharing
"When the patient struggled to understand the procedure, I used a surgical diagram to demonstrate each step and addressed all questions."	Information Expression
"The patient feared local anesthesia, so I explained its safety and shared recovery cases. They relaxed visibly and asked to consult family."	Information Exchange (derived from Sharing)
"I provided printed postoperative instructions and suggested our online Q&A platform. The patient later asked detailed follow-up questions there."	Information Exchange (derived from Expression)

3.4 Analysis of Emotional Change and Information Behavior During Interview

Primary emotions (anxiety, fear) trigger information-seeking behaviors that generate derived emotions (e.g., relief after research, confidence from surgical visuals). This cyclical interaction demonstrates how initial emotions drive information engagement, which then reshapes emotional states, with derived emotions showing greater individual variation than primary ones.(Emotion and information behavior in Table 4).

Table 4. Emotion and information behavior in interview corpus

Emotion Type	Original Transcript	Interpretation
Primary Emotion	"When I noticed my mole had enlarged, I felt uneasy and searched online for causes and surgical risks."	Information about "mole growth" triggered worry and fear.
Primary Emotion	"Though the doctor explained the treatment plan, I later consulted a medical student friend to discuss its feasibility."	Information about the "treatment plan" triggered confusion and concern.
Derived Emotion	"The doctor showed me an excision procedure illustration, which clarified the process and helped me decide to proceed."	Information expression/retrieval led to trust and reassurance.
Derived Emotion	"Concerned about recovery, I shared the doctor's postoperative instructions with my family to plan logistics."	Information sharing and decision-making fostered anticipation.

3.5 Outcome Space

Using phenomenography, we examined emotion-information behavior interactions in preoperative communication (Figure 1). External stimuli trigger primary emotions that drive information behaviors (seeking, sharing, expression), which then differentially affect emotions: acquisition may reduce uncertainty, sharing typically alleviates distress, and expression has weaker effects. These behaviors often lead to derived information exchanges, where positive interactions foster optimism, with outcomes shaped by resolution quality.

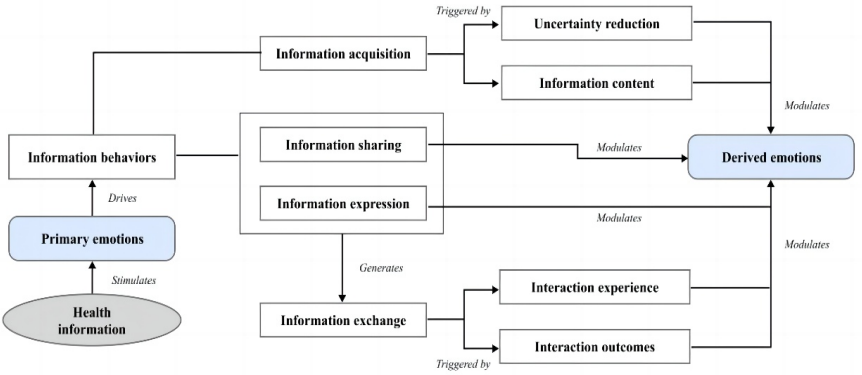

Fig. 1. Outcome Space - Interaction Between Emotions and Information Behaviors in Preoperative Communication

4 Design Strategies

4.1 Multidirectional Interaction Between Emotions and Information Behaviors

Effective preoperative product design would benefit from prioritize emotional considerations through three key strategies: emotion-aware intelligent systems (using wearables to detect anxiety and adapt information delivery pace/content), multimodal information presentation (tailoring animation/text/voice formats to emotional states - e.g., simplified visuals for anxious users versus detailed texts for calm patients), and affective interface design (employing warm colors and reassuring vocal tones to reduce tension). These approaches collectively enhance information comprehension by aligning with users' dynamic emotional needs during surgical preparation.

4.2 Behavior itself and Information content both significantly influence emotional states

Optimizing information delivery to enhance Comprehension and improve information exchange, we propose three strategies: personalized content matching (tailoring information density to emotional states - concise reassurance for anxious patients versus comprehensive details for calm recipients), structured phased delivery (sequencing

information across preoperative stages to avoid overload, e.g., preparatory instructions one week prior, last-minute reminders 24 hours beforehand), and contextualized design (VR surgical simulations for environmental familiarization and scenario-based language for mental preparation). This approach ensures critical information prioritization while adapting to patients' psychological needs.

4.3 Communication Experience and Outcomes as Catalysts for Emotional Change

Enhancing interaction experience and fostering positive communication outcomes. This approach integrates three key strategies: Interactive Support Tools (AI-powered Q&A systems and virtual assistants that detect emotional cues to deliver tailored support, such as encouraging messages for anxious patients), personalized communication process (adapting CICARE-based interactions to individual emotional states through tone adjustment and information pacing), and postoperative follow-up systems (structured telehealth check-ins within one week after surgery to address lingering concerns and provide psychological support). Together, these strategies improve both the process and results of clinical communication by aligning with patients' emotional needs.

5 Conclusion

In this study on preoperative communication, a phenomenographic approach was used. Key findings include the emotion information behavior cycle, critical interaction patterns, and preoperative communication design implications. These are important for future preoperative communication. This study has several limitations. First, the modest sample size may not fully capture the diversity of emotion-information behavior interactions in clinical communication, warranting future large-scale validation. Second, while phenomenography effectively explores complex relationships, its interpretive nature introduces potential subjectivity; complementary methods (e.g., experimental designs, surveys) could strengthen analytical rigor in subsequent research.

Acknowledgments

We express our sincere appreciation to the editor for insightful guidance.

Disclosure of Interests

The authors have no competing interests to declare that are relevant to the content of this article.

References

1. Li, Y., et al., A review for information behavior research during the time period of the 13th five-year plan in China. J. Inf. Resour. Manag, 2022. 12: p. 21-33.
2. Patterson, D.E. and S. Mastracci, Review of Descartes' Error: Emotion, Reason, and the Human Brain. Administrative Theory & Praxis, 2019. 41(2): p. 186-188.
3. Lu, D. and D. Hong, Emotional contagion: research on the influencing factors of social media Users' negative emotional communication during the Covid-19 pandemic. Frontiers in psychology, 2022. 13: p. 931835.
4. Yari Zanganeh, M. and N. Hariri, The role of emotional aspects in the information retrieval from the web. Online Information Review, 2018. 42(4): p. 520-534.
5. Svensson, M., U. Nilsson, and M. Svantesson, Patients' experience of mood while waiting for day surgery. Journal of clinical nursing, 2016. 25(17-18): p. 2600-2608.
6. Miles, K., B. O'Neill, and S. Li, The 'Kidney'model for optimising feedback in undergraduate clinical communication: A meta-ethnographic systematic review. Patient Education and Counseling, 2024. 119: p. 108050.
7. Hernandez, R., et al., Reliability and Validity of Ecological Momentary Assessment Response Time–Based Measures of Emotional Clarity: Secondary Data Analysis. JMIR Mental Health, 2024. 11(1): p. e58352.
8. Jones, N.W., Simulated Clinical Experience: An Investigation of Emotion Understanding and Management. 2019: Walden University.
9. Marton, F., Phenomenography—describing conceptions of the world around us. Instructional science, 1981. 10(2): p. 177-200.
10. Saleem, M., et al., A Digital Tool (Technology-Assisted Problem Management Plus) for Lay Health Workers to Address Common Mental Health Disorders: Co-production and Usability Study in Pakistan. JMIR formative research, 2025. 9(1): p. e59414.
11. Audrin, C. and B. Audrin, Emotional intelligence in digital interactions–A call for renewed assessments. Personality and Individual Differences, 2024. 223: p. 112613.
12. Sjöström, B. and L.O. Dahlgren, Applying phenomenography in nursing research. Journal of advanced nursing, 2002. 40(3): p. 339-345.