

Influencing factors of continuance intention of online consultation among cancer survivors: Grounded theory study

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Influencing factors of continuance intention of online consultation among cancer survivors: Grounded theory study

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Abstract

Background: Online consultation platforms have become an important component of cancer survivorship care, particularly in contexts where survivors require long-term follow-up and reassurance. While adoption increased during the COVID-19 pandemic, evidence on the factors influencing continued utilization among cancer survivors remains limited, especially in China.

Objective: This study aimed to explore the influencing factors of continued utilization of online consultation among cancer survivors in Southwest China and to develop a grounded theoretical model explaining continuance intention.

Methods: A grounded theory qualitative design was employed. Twenty-six cancer survivors with diverse cancer types, treatment stages, and demographic characteristics were recruited from the Sichuan Cancer Hospital & Institute and affiliated institutions. Semi-structured telephone interviews were conducted, transcribed verbatim, and analyzed through open, axial, and selective coding. Data collection continued until theoretical saturation was achieved.

Results: Six interrelated domains influenced survivors' continued use of online consultation platforms: platform quality, physician competence, user perception, individual condition, external context, and privacy concerns. User perception mediated the impact of platform quality and physician competence, while individual condition and external context exerted both direct and indirect influences. Privacy concerns acted as a moderator, as survivors weighed perceived benefits against risks of disclosure. The final theoretical model positioned continuance intention at the center of these interconnected domains, reflecting survivors' negotiation between technological features, relational care, personal health status, family involvement, and privacy considerations.

Conclusions: Cancer survivors' willingness to continue using online consultation depends on multiple interrelated factors beyond technological usability. Sustained engagement is shaped by survivors' perceptions of usefulness and trust, physician empathy and timeliness, family encouragement, and acceptance of privacy trade-offs. The theoretical model advances understanding of digital health continuance in oncology and offers practical guidance for developing survivor-centered online consultation services.

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Original Manuscript

Influencing factors of continuance intention of online consultation among cancer survivors: Grounded theory study

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Keywords: cancer survivors; online consultation; telemedicine; digital health; grounded theory; continuance intention; patient engagement; physician-patient communication; privacy concerns; survivorship care

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1. Introduction

Cancer remains one of the leading causes of morbidity and mortality worldwide, placing a tremendous burden on health systems, families, and individuals. Advances in diagnosis and treatment have improved survival rates, and as a result the population of cancer survivors continues to expand[1-3]. Survivorship, however, is not simply the

period after treatment. It also includes ongoing challenges such as long-term side effects, fear of recurrence, psychosocial adjustment, and the need for continuous follow-up care. The WHO and many national cancer control programs have emphasized the importance of survivorship care as an integral component of comprehensive cancer management[4, 5].

Digital health technologies have become increasingly important in bridging gaps in access to care, especially for patients requiring long-term monitoring[6-8]. Online consultation platforms, delivered through mobile applications or web portals, allow survivors to communicate with oncology professionals, seek advice on symptoms or lifestyle modifications, and obtain psychological support. For survivors living in regions with limited oncology resources, online consultation provides a vital link to specialists otherwise geographically inaccessible[9-12]. Even in urban centers with advanced hospitals, the platforms offer convenience and continuity between scheduled in-person visits[13, 14].

The COVID-19 pandemic further accelerated the adoption of telemedicine and online health services, demonstrating their potential to supplement traditional care[14-16]. Cancer survivors, often immunocompromised, benefitted from reduced exposure to hospital environments through digital consultations. As health systems adapt to post-pandemic realities, online consultation is positioned as a permanent component of integrated cancer survivorship care. Yet the long-term viability of such services depends not merely on initial adoption but on survivors' willingness to continue using them. Understanding the factors that shape continued utilization is therefore essential for sustaining the role of online consultation in oncology care.

Research on online consultation and telemedicine has expanded rapidly in recent years, with a growing focus on usage patterns and determinants of adoption[17-19]. Several theoretical models have guided this scholarship. The Technology Acceptance Model (TAM) and Expectation Confirmation Model (ECM) are frequently employed to examine perceived usefulness, ease of use, and satisfaction as drivers of continued use. Studies across various digital health contexts, including mobile health (mHealth) applications, wearable devices, and patient portals, have confirmed that perceived usefulness and trust are strong predictors of sustained engagement[19-22].

In oncology, early work highlighted the potential of online consultation to support symptom management, medication adherence, and patient–provider communication. For example, randomized controlled trials in breast cancer survivors demonstrated that digital follow-up systems improved quality of life and reduced hospital visits[23-26]. Observational studies in Europe and Asia reported that online consultation platforms were especially effective in providing dietary advice, managing side effects, and delivering psychosocial support to survivors[27-29].

A growing body of literature has investigated continuance intention in digital health contexts. In non-oncology populations, continuance is influenced by habit formation, social influence, and perceived quality of service. For instance, research on chronic disease management apps found that individuals with strong digital literacy and positive reinforcement from peers were more likely to continue usage[30-32]. Other studies identified cost, accessibility, and integration with offline care as determinants of sustained use[33, 34]. In cancer populations, however, empirical evidence remains fragmented. Some studies of breast cancer survivors revealed that online consultation provided emotional reassurance and complemented offline care[35-37], while others found survivors discontinued use due to inconsistent physician availability and lack of trust[38].

While prior studies provide valuable insights into adoption and satisfaction with online consultation, few have systematically investigated the factors influencing cancer survivors' continued utilization over time. Most quantitative research has relied on pre-existing models such as TAM or ECM, which capture perceptions of technology but may not adequately reflect the lived realities of survivorship. Survivors navigate a complex interplay of medical, psychological, social, and technological factors. Their willingness to sustain engagement with online consultation cannot be reduced to perceived usefulness alone.

There is also a lack of theory-building research specific to oncology survivorship in the Chinese context. China has one of the world's largest populations of cancer survivors, with distinct healthcare structures, cultural expectations, and digital ecosystems. Survivors in Southwest China, for example, may face particular challenges due to uneven distribution of oncology resources, reliance on family support, and rapidly expanding digital health infrastructure. A grounded theory approach, which builds theory inductively from qualitative data, is well-suited to capture the complexities and generate new insights into continuance intention in this setting.

This study aimed to explore the influencing factors of continued utilization of online consultation among cancer survivors in Southwest China. Guided by grounded theory methodology, the study sought to inductively develop a theoretical model that explains how survivors perceive, negotiate, and decide on sustained use of online consultation services. Specifically, the objective was to identify the individual, relational, and systemic factors that encourage or inhibit continuance, and to articulate how the factors interrelate within the context of survivorship care.

This research makes several contributions to the literature and practice of digital oncology care. First, it expands understanding of continuance intention by focusing not merely on adoption or initial satisfaction but on the long-term dynamics of survivor engagement. Second, it contributes a theory-driven framework grounded in empirical data from cancer survivors in China, addressing a significant gap in survivorship research. Third, it highlights the interplay between technological features, physician competence, survivor perceptions, individual conditions, family and social contexts, and privacy concerns, thereby offering a more holistic view of digital health continuance. Finally, the study provides practical implications for policymakers, healthcare institutions, and technology developers seeking to design sustainable online consultation services that meet the complex needs of cancer survivors.

2. Methods

2.1. Study design

This study employed a grounded theory qualitative design to examine the influencing factors of continued utilization of online consultation among cancer survivors. Grounded theory was chosen because it allows theories to emerge inductively from the data rather than testing preconceived hypotheses. The approach enabled in-depth exploration of survivors' perspectives on digital health platforms, focusing on how their experiences, conditions, and contextual circumstances shaped their continued use. Data collection and analysis proceeded simultaneously, using the classical three-stage process of open coding, axial coding, and selective coding.

2.2. Study setting

The study was conducted at the Sichuan Cancer Hospital & Institute, Sichuan Cancer Center, and the Affiliated Cancer Hospital of the University of Electronic Science and Technology of China (UESTC). This institution is the largest national tertiary Level A cancer hospital in Southwest China, with comprehensive functions in cancer prevention, treatment, rehabilitation, research, and education. Its extensive clinical services and diverse patient population made it an ideal setting for examining cancer survivors' experiences with online consultation platforms.

2.3. Participants and recruitment

Participants were adult cancer survivors with diverse cancer types and survivorship stages. To be eligible, they had to be 18 years or older, have received a confirmed cancer diagnosis and at least one treatment course such as chemotherapy, radiotherapy, or surgery, and have used online consultation at least once in the preceding year. Individuals also needed to provide verbal consent and be able to complete a phone interview in Mandarin. Participants were excluded if they were in severe clinical distress or unable to communicate effectively by phone.

Recruitment followed purposive sampling to maximize diversity of experiences. Survivors were approached through outpatient follow-up clinics, survivorship support groups, and patient-led online forums. Sampling accounted for variation in gender, age, cancer type, treatment stage, and geographic location. A total of 26 survivors were interviewed. Data collection continued until theoretical saturation was achieved, defined as the point where no new concepts or categories emerged. Saturation was reached at 23 interviews, and three additional interviews confirmed stability of the themes.

2.4. Participant characteristics

The 26 participants included 15 females (57.7%) and 11 males (42.3%), with the majority being middle-aged 40–49 years (30.8%) or 50–59 years (26.9%). Breast cancer survivors formed the largest group (26.9%), followed by lung (15.4%) and colorectal cancer (11.5%), while other cancer types such as cervical, ovarian, prostate, gastric, and thyroid each represented 7.7%, and liver and kidney each 3.8%. Survivorship stages were balanced, with 30.8% in active treatment, and 34.6% each in remission and long-term survivorship. Educational levels ranged from 23.1% with high school or below to 11.5% with postgraduate education. Most participants were employed (42.3%), and 61.5% lived in urban areas.

Table 1. Characteristics of participants (N = 26)

Category		Distribution (n, %)	
Gender	Female	15	57.7
	Male	11	42.3
Age (years)	30–39	5	19.2
	40–49	8	30.8
	50–59	7	26.9
	≥60	6	23.1
Cancer type	Breast	7	26.9
	Lung	4	15.4
	Colorectal	3	11.5
	Cervical	2	7.7
	Ovarian	2	7.7
	Prostate	2	7.7
	Gastric	2	7.7
	Thyroid	2	7.7
	Liver	1	3.8
	Kidney	1	3.8
Treatment stage	Active treatment	8	30.8
	Remission	9	34.6
	Long-term survivorship	9	34.6
Education level	High school or below	6	23.1
	College/Junior college	10	38.5
	Bachelor's degree	7	26.9
Occupation	Master's or above	3	11.5
	Employed	11	42.3
	Retired	7	26.9
	Homemaker	3	11.5
	Self-employed	3	11.5
	Unemployed	2	7.7
Geographic location	Urban	16	61.5

Semi-urban/rural	10	38.5
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2.5. Data collection

Data were collected through telephone interviews, which was chosen for accessibility, convenience, and infection-control considerations. Each interview lasted between 25 and 40 minutes. A semi-structured interview guide was developed to explore perceptions of online consultation, motivations for continued use, perceived benefits and barriers, physician interactions, trust in platforms, privacy concerns, and anticipated future use. The guide was piloted with two survivors, leading to refinement of wording for clarity. (Appendix 1) Interviews were audio-recorded with participants' consent and transcribed verbatim. Each transcript was anonymized and coded with identifiers C01 to C26.

2.6. Data analysis

Open coding was performed line by line to extract initial concepts. This stage produced 55 concepts reflecting issues such as reliance on physicians' expertise, reassurance from online follow-up, dissatisfaction with delayed replies, encouragement from family, and anxiety about data leakage. (Appendix 2)

Axial coding grouped the into 20 categories and ultimately consolidated them into six overarching domains: platform quality, physician competence, user perception, individual condition, external context, and privacy concerns. Selective coding synthesized the domains into a theoretical model that explained continuance intention.

Theoretical saturation was assessed after 23 interviews. No new categories appeared in the final three interviews, confirming saturation.

2.7. Rigor and trustworthiness

Credibility and trustworthiness were assured through multiple strategies. Sampling included survivors of varying demographic and clinical backgrounds to capture heterogeneity. Coding was conducted independently by two researchers, and differences were resolved through consensus. Interim results were discussed in research team meetings, ensuring reflexivity and transparency. Four participants reviewed the thematic summaries and confirmed alignment with their experiences. A complete audit trail was maintained, including analytic memos that

documented coding decisions and theoretical development. The strategies enhanced credibility, dependability, confirmability, and transferability of the findings.

2.8. Ethical considerations, privacy protection, and data confidentiality

The study protocol was reviewed and approved by the ethics committee of Sichuan Cancer Hospital & Institute. Participants provided informed verbal consent before interviews. They were assured that participation was voluntary and that they could withdraw at any point without consequences for their clinical care.

To protect privacy, identifying information was removed from transcripts, and pseudonyms were used throughout. Data were stored on password-protected devices accessible only to the research team. Audio files were deleted immediately after transcription. In reporting, no specific combinations of characteristics were disclosed that could inadvertently reveal identities. Given the sensitivity of cancer histories and medical records, particular attention was paid to data confidentiality. Findings are presented in aggregated form to ensure anonymity.

3. Results

Analysis identified six domains shaping cancer survivors' continued use of online consultation platforms: platform quality, physician competence, user perception, individual condition, external context, and privacy concerns. The interrelationships among the domains formed a theoretical model explaining continuance intention.

3.1. Platform quality

Platform quality encompassed service quality and information quality. Survivors valued consistent access to oncology specialists, transparent consultation fees, reliable technical support, and effective complaint resolution. Information quality included completeness of physician profiles, clarity of treatment explanations, and access to trustworthy cancer-related educational content.

Table 2. Themes and subthemes related to platform quality

Subtheme	Key insights	Quote
Service quality	Survivors expected efficient systems, reasonable fees, and	<i>"The charges were clear. I could reach the same oncologist again. The convenience made me continue."</i>

Information quality	transparent policies.	(C04, male, gastric cancer)
	Accurate physician and treatment information increased trust.	<i>"I can see which doctors are experts or which are younger doctors. It's easier than going to the hospital."</i> (C21, female, ovarian cancer)

3.2. Physician competence

Physician competence emerged as central. Survivors highlighted professional expertise, communication ability, and timeliness. Expertise reassured patients on side-effect management and recurrence risks. Compassionate communication provided emotional support. Timely responses were critical, especially during treatment.

Table 3. Themes and subthemes related to physician competence

Subtheme	Key insights	Quote
Professional expertise	Detailed, tailored explanations increased trust.	<i>"When the doctor explained why my fatigue persisted, it felt like guidance I could trust."</i> (C18, male, lung cancer)
Communication ability	Survivors valued empathy and encouragement.	<i>"She told me that anxiety was normal, and suddenly I felt less alone. That made me come back."</i> (C09, female, breast cancer)
Timeliness	Delays discouraged use; quick replies reinforced reliance.	<i>"During chemo, hours felt like days. A fast reply was the reason I kept using the app."</i> (C23, male, colorectal cancer)

3.3. User perception

User perception comprised ease of use, perceived usefulness, and positive expectation. Survivors emphasized the importance of intuitive interfaces and smooth navigation. Usefulness was defined as reassurance between hospital visits, management of treatment side effects, and guidance for lifestyle adaptation. Positive expectation referred to trust in the future development of digital health services.

Survivors described online consultation as a lifeline during uncertain recovery phases. One participant noted: *"Even when nothing urgent, knowing I could reach professional doctors quickly gave me comfort."* (C06, female, cervical cancer).

3.4. Individual condition

Individual condition referred to health literacy, health status, and personal needs. Survivors with higher health literacy were more confident in engaging online, whereas those with limited literacy faced challenges in sustained use. Health status influenced patterns: those experiencing lingering treatment effects frequently sought reassurance, while long-term survivors without active symptoms used consultation more sporadically. Needs extended beyond medical queries to psychological reassurance and lifestyle advice.

One participant said: *“After surgery I still had numbness in my hands, and I didn’t always know if it was normal. Having the online consultation gave me a way to check quickly without waiting weeks for my hospital appointment.”* (C02, Female, 52, breast cancer survivor)

3.5. External context

External context included family encouragement, peer influence, and offline healthcare alternatives. Family members often facilitated continued use, particularly adult children assisting older survivors with technology. Peer groups shared recommendations of reliable platforms, which reinforced trust. Survivors in rural areas with limited oncology services relied heavily on online consultation, whereas those living near tertiary hospitals sometimes preferred in-person visits.

For instance, a participant mentioned: *“My son insisted I keep using the app. He said it was safer than traveling two hours to the hospital every time I worried about something small, and he even helped me learn how to pay for consultations.”* (C09, Male, 63, colorectal cancer survivor)

3.6. Privacy concerns

Privacy concerns centered on disclosure of medical records, genetic test results, and sensitive images. Survivors expressed anxiety about misuse of their cancer history but balanced this against perceived benefits. When consultations provided timely reassurance, survivors accepted privacy trade-offs.

One survivor explained: *“I hesitated before uploading my CT scans, but the doctor’s advice was worth it.”* (C12, male, prostate cancer).

3.7. Interrelationships among domains

The findings revealed that platform quality and physician competence shaped user perception, which emerged as the strongest mediator of continuance intention. Survivors' individual condition directly influenced both perception and intention, depending on health literacy and treatment status. External context reinforced or reduced continuance depending on family support and offline service availability. Privacy concerns moderated the relationships, as survivors continuously weighed risks against benefits. (Table 4)

Table 3. Representative relationships and supporting quotes

Relationship	Description
User perception → Intention	Perceptions of usefulness and trust shaped continuity
Platform quality → Perception	Service quality enhanced trust and ease of use
Physician competence →	Physician expertise built reassurance
Perception	
External context → Intention	Peer recommendations influenced adoption
Individual condition → Intention	Active symptoms increased reliance
Privacy concern → Intention	Anxiety reduced willingness

3.8. Theoretical model

The final theoretical model positions continuance intention at the center, influenced by six interconnected domains. Platform quality and physician competence directly influence user perception, which mediates the relationship with continuance. Individual condition and external context exert both direct and indirect effects. Privacy concerns act as a contextual moderator, influencing the strength of survivors' willingness to continue. (Figure 1)

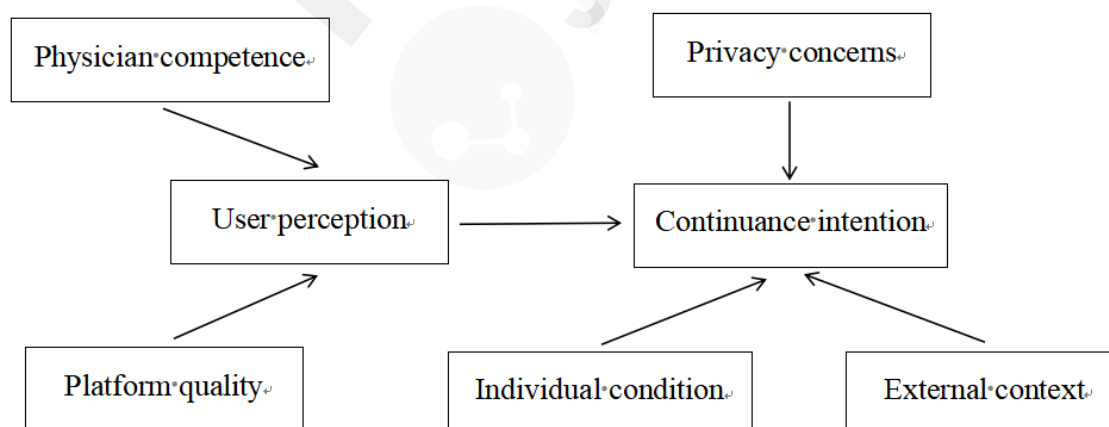


Figure 1. Theoretical model of influencing factors for continued utilization of online consultation among cancer survivors

4. Discussion

4.1. Principal findings

Analysis of in-depth interviews with 26 Chinese cancer survivors identified six interrelated domains that shaped continuance intention: platform quality, physician competence, user perception, individual condition, external context, and privacy concerns. The domains were integrated into a theoretical model illustrating how survivors' decisions to continue using online consultation platforms were mediated by perceptions of usefulness, trust, and accessibility, while simultaneously shaped by their personal health status, family influences, and privacy considerations. The findings underscore that continued use is not determined solely by technological ease or usefulness, but emerges from a dynamic negotiation between survivors' individual needs, relational contexts, and systemic constraints.

4.2. Comparison with prior work

Previous studies have consistently identified perceived usefulness, trust, and habit formation as determinants of sustained use. For example, research on mobile disease management apps demonstrated that convenience and ease of monitoring reinforced long-term engagement[39, 40]. Other studies linked continuance intention to perceptions of quality of physician feedback and integration into daily routines[41, 42]. This suggests that the mechanisms of continuance identified in our study are not unique to oncology but resonate with broader digital health behaviors.

Cancer survivors often experience uncertainty long after completion of primary treatment, with concerns about recurrence, lingering side effects, and psychosocial adjustment[43-45]. Unlike users of general wellness or chronic disease apps, survivors in our study emphasized the importance of empathetic physician communication and reassurance as key reasons for continuing online consultations. This aligns with studies in breast cancer survivors, which found that online consultations offered emotional support and alleviated isolation[46, 47]. By centering survivors' voices, our grounded theory extends beyond existing quantitative models that have often prioritized technological features over relational care.

Privacy concerns emerged as a moderator of continuance intention. Prior work has documented anxiety about data security in telemedicine broadly[48, 49], but our findings reveal that survivors actively weigh the risks of disclosure against perceived benefits of reassurance. For example, some participants expressed hesitation about uploading genetic test results or sensitive images but ultimately continued use when the consultation reduced uncertainty. This dynamic risk-benefit trade-off is less discussed in the literature but resonates with recent studies in Chinese mHealth contexts, which report that patients are more willing to share personal data when platforms are affiliated with reputable hospitals[50]. Our study shows that this negotiation is particularly salient in oncology, where personal health information carries social and familial implications.

The influence of external context, particularly family involvement, also distinguishes survivorship care from general digital health. In line with research on healthcare decision-making in collectivist cultures, our findings reveal that family members often encouraged or facilitated continued use, for instance by setting up accounts or managing payments. Similar results were reported in studies of elderly populations in rural China, where adult children played a central role in sustaining digital health engagement[51-53]. In our sample, peer influence from support groups further reinforced trust and continuance, echoing findings from survivorship communities in Western contexts[54].

4.3. Theoretical and practical implications

This study contributes to theoretical development in several ways. First, it demonstrates the value of grounded theory for understanding continuance intention in digital health, moving beyond the TAM or ECM. Whereas prior frameworks emphasized technological usability and satisfaction, our model foregrounds the interplay of relational, contextual, and personal health factors. In doing so, it enriches the theoretical vocabulary available to scholars studying long-term engagement with health technologies.

Second, the model underscores the mediating role of user perception. Survivors' willingness to continue was not simply a product of platform quality or physician competence in isolation, but of how the shaped perceptions of usefulness, trust, and reassurance. This finding suggests that future theoretical models of continuance should incorporate perception as an active interpretive process shaped by both system attributes and lived survivorship experiences.

Third, the study extends understandings of privacy concerns in digital health. Rather than functioning as a static barrier, privacy concerns acted as a dynamic moderator, influencing the strength of continuance intention depending on survivors' appraisal of risks and benefits. This nuanced conceptualization challenges simplistic dichotomies of "privacy concern" versus "no concern" and suggests that continuance intention should be viewed as an ongoing negotiation.

From a practical perspective, the findings carry important implications for the design and implementation of online consultation services in oncology care. Platforms should prioritize clear physician profiles, transparent fee structures, and reliable technical support to enhance perceptions of quality. Physicians providing online consultations should be trained not only in clinical communication but also in empathetic engagement to address survivors' psychological and emotional needs. Timeliness of responses is crucial, especially for survivors undergoing active treatment, and systems should be designed to minimize delays, for example through triage protocols or automated notifications.

Addressing privacy concerns requires transparent communication about data protection policies and visible affiliations with trusted institutions. Survivors in our study expressed greater trust when platforms were linked to tertiary hospitals, suggesting that institutional endorsement can mitigate anxiety. Moreover, given the importance of family encouragement, platforms might consider features that facilitate caregiver involvement, such as shared accounts or family-centered consultation modes. Such innovations could align with cultural practices while sustaining survivor engagement.

4.4. Limitations

First, the study was conducted in a single regional setting in Southwest China. Although the institution is the largest cancer center in the region, experiences may differ in other parts of China or in countries with different healthcare systems. Second, the reliance on self-reported data may be subject to recall bias or social desirability effects, particularly when discussing sensitive issues such as privacy or dissatisfaction with physicians. Third, while the sample was diverse, it did not capture perspectives from survivors who had never used online consultation, limiting comparisons between adopters and non-adopters. Finally, the qualitative design precludes generalization to all cancer survivors, although theoretical transferability to similar contexts is possible.

4.5. Future directions

Future research should test the theoretical model developed in this study through quantitative methods. Large-scale surveys could examine the relative influence of the six domains and validate their interrelationships. Cross-cultural comparative studies would be valuable to assess whether the role of family support and privacy negotiation is unique to China or generalizable to other contexts. Further, longitudinal research could explore how continuance intention evolves across different phases of survivorship, from active treatment to long-term follow-up.

Intervention studies could also evaluate strategies to strengthen continuance. For instance, training programs for physicians in digital empathy, or platform designs that allow caregiver participation, may enhance perceptions of usefulness and trust. Policy research should investigate frameworks for data protection that balance survivors' privacy with the need for effective digital oncology services. As cancer survivorship continues to grow worldwide, such research is critical for integrating online consultation into sustainable, patient-centered models of care.

5. Conclusions

Six factors influence cancer survivors' continued utilization of online consultation and integrated them into a theoretical model. Survivors' continuance intention was shaped by the quality of platforms, competence of physicians, perceptions of usefulness, individual health conditions, external relational contexts, and privacy concerns. The findings advance theoretical understanding of digital health continuance and provide practical guidance for designing survivor-centered online consultation services. By addressing survivors' medical, emotional, relational, and privacy needs, online consultation can play a sustained and meaningful role in comprehensive cancer survivorship care.

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1. Chen, Z.-D., et al., *Recent Advances in the Diagnosis, Staging, Treatment, and Prognosis of Advanced Gastric Cancer: A Literature Review*. Frontiers in Medicine, 2021. **8**.
2. Zeineddine, F., et al., *Survival improvement for patients with metastatic colorectal cancer over twenty years*. NPJ Precision Oncology, 2023. **7**.
3. Siegel, R., et al., *Cancer Statistics, 2021*. CA: A Cancer Journal for Clinicians, 2021. **71**: p. 33-37.
4. Jacobsen, P., et al., *Systematic Review of the Impact of Cancer Survivorship Care Plans on Health Outcomes and Health Care Delivery*. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 2018. **36 20**: p. 2088-2100.
5. Chan, R., et al., *Effectiveness and implementation of models of cancer survivorship care: an overview of systematic reviews*. Journal of Cancer Survivorship, 2021. **17**: p. 197-221.
6. Marthick, M., et al., *Supportive Care Interventions for People With Cancer Assisted by Digital Technology: Systematic Review*. Journal of Medical Internet Research, 2020. **23**.
7. Garg, S., et al., *Clinical Integration of Digital Solutions in Health Care: An Overview of the Current Landscape of Digital Technologies in Cancer Care*. JCO clinical cancer informatics, 2018. **2**: p. 1-9.
8. Mikles, S., A. Griffin, and A. Chung, *Health information technology to support cancer survivorship care planning: A systematic review*. Journal of the American Medical Informatics Association : JAMIA, 2021.
9. Morris, B., B. Rossi, and B. Fuemmeler, *The role of digital health technology in rural cancer care delivery: A systematic review*. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association, 2021.
10. Shi, J., et al., *"Everything cannot be handled virtually": Understanding intention and use of digital health technologies among rural adults and rural cancer survivors*. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association, 2025. **41 1**.
11. Hemming, L., et al., *A systematic review of peer support interventions to improve psychosocial functioning among cancer survivors: can findings be translated to survivors with a rare cancer living rurally?* Orphanet Journal of Rare Diseases, 2024. **19**.
12. Pradhan, P., et al., *Models of survivorship care in patients with head and neck cancer in regional, rural, and remote areas: a systematic review*. Journal of cancer survivorship : research and practice, 2024.

13. Ramlee, M.H.B. and N.A. Satar, *The feasibility and preliminary efficacy of a locally developed digital health intervention in improving breast cancer survivor's quality of life (QOL): Qualitative and quantitative analysis result*. Journal of Clinical Oncology, 2024.
14. Onyeaka, H., et al., *Use of digital health tools for health promotion in cancer survivors*. Psycho-Oncology, 2021. **30**: p. 1302-1310.
15. Toni, E. and H. Ayatollahi, *An insight into the use of telemedicine technology for cancer patients during the Covid-19 pandemic: a scoping review*. BMC Medical Informatics and Decision Making, 2024. **24**.
16. Royce, T., H. Sanoff, and A. Rewari, *Telemedicine for Cancer Care in the Time of COVID-19*. JAMA oncology, 2020.
17. Pang, N., et al., *Telemedicine Acceptance Among Older Adult Patients With Cancer: Scoping Review*. Journal of Medical Internet Research, 2022. **24**.
18. Irurita-Morales, P., et al., *Use of Telehealth Among Cancer Survivors: A Scoping Review*. Telemedicine journal and e-health : the official journal of the American Telemedicine Association, 2022.
19. Cox, A., et al., *Cancer Survivors' Experience With Telehealth: A Systematic Review and Thematic Synthesis*. Journal of Medical Internet Research, 2017. **19**.
20. Mou, J., D.D. Shin, and J. Cohen, *Understanding trust and perceived usefulness in the consumer acceptance of an e-service: a longitudinal investigation*. Behaviour & Information Technology, 2017. **36**: p. 125-139.
21. Adjekum, A., A. Blasimme, and E. Vayena, *Elements of Trust in Digital Health Systems: Scoping Review*. Journal of Medical Internet Research, 2018. **20**.
22. Liu, K. and D. Tao, *The roles of trust, personalization, loss of privacy, and anthropomorphism in public acceptance of smart healthcare services*. Comput. Hum. Behav., 2022. **127**: p. 107026.
23. Pimentel-Parra, G.A., et al., *Effectiveness of Digital Health on the Quality of Life of Long-Term Breast Cancer Survivors: A Systematic Review*. Seminars in oncology nursing, 2023: p. 151418.
24. Saltbæk, L., et al., *Nurse-Led Individualized Follow-Up Versus Regular Physician-Led Visits After Early Breast Cancer (MyHealth): A Phase III Randomized, Controlled Trial*. Journal of Clinical Oncology, 2024. **42**: p. 2038-2049.
25. Saevarsdottir, S. and S. Gudmundsdottir, *Mobile Apps and Quality of Life in Patients With Breast Cancer and Survivors: Systematic Literature Review*. Journal of Medical Internet Research, 2022. **25**.

26. Little, P., et al., *Digital intervention (Renewed) to support symptom management, wellbeing, and quality of life among cancer survivors in primary care: a randomised controlled trial*. The British Journal of General Practice, 2023. **75**.
27. Lazăr, D.-E., et al., *Web-based nutrition: a useful resource for cancer patients?* Frontiers in Nutrition, 2023. **10**.
28. Medina, J., et al., *ICONnecta't: Development and Initial Results of a Stepped Psychosocial eHealth Ecosystem to Facilitate Risk Assessment and Prevention of Early Emotional Distress in Breast Cancer Survivors' Journey*. Cancers, 2022. **14**.
29. Walsh, C. and M.A. Achkar, *A qualitative study of online support communities for lung cancer survivors on targeted therapies*. Supportive Care in Cancer, 2021. **29**: p. 4493-4500.
30. Taylor, M., et al., *Digital health experiences reported in chronic disease management: An umbrella review of qualitative studies*. Journal of Telemedicine and Telecare, 2022. **28**: p. 705-717.
31. Verweel, L., et al., *The effect of digital interventions on related health literacy and skills for individuals living with chronic diseases: A systematic review and meta-analysis*. International journal of medical informatics, 2023. **177**: p. 105114.
32. Li, Z., et al., *Usability and Effectiveness of eHealth and mHealth Interventions That Support Self-Management and Health Care Transition in Adolescents and Young Adults With Chronic Disease: Systematic Review*. Journal of Medical Internet Research, 2024. **26**.
33. Endalamaw, A., et al., *A scoping review of digital health technologies in multimorbidity management: mechanisms, outcomes, challenges, and strategies*. BMC Health Services Research, 2025. **25**.
34. Gentili, A., et al., *The cost-effectiveness of digital health interventions: A systematic review of the literature*. Frontiers in Public Health, 2022. **10**.
35. Akkol-Solakoglu, S. and D. Hevey, *Internet-delivered cognitive behavioural therapy for depression and anxiety in breast cancer survivors: Results from a randomised controlled trial*. Psycho-Oncology, 2023. **32**: p. 446-456.
36. Peng, L., et al., *Effects of an online mindfulness-based intervention on Fear of Cancer Recurrence and quality of life among Chinese breast cancer survivors*. Complementary therapies in clinical practice, 2022. **49**: p. 101686.

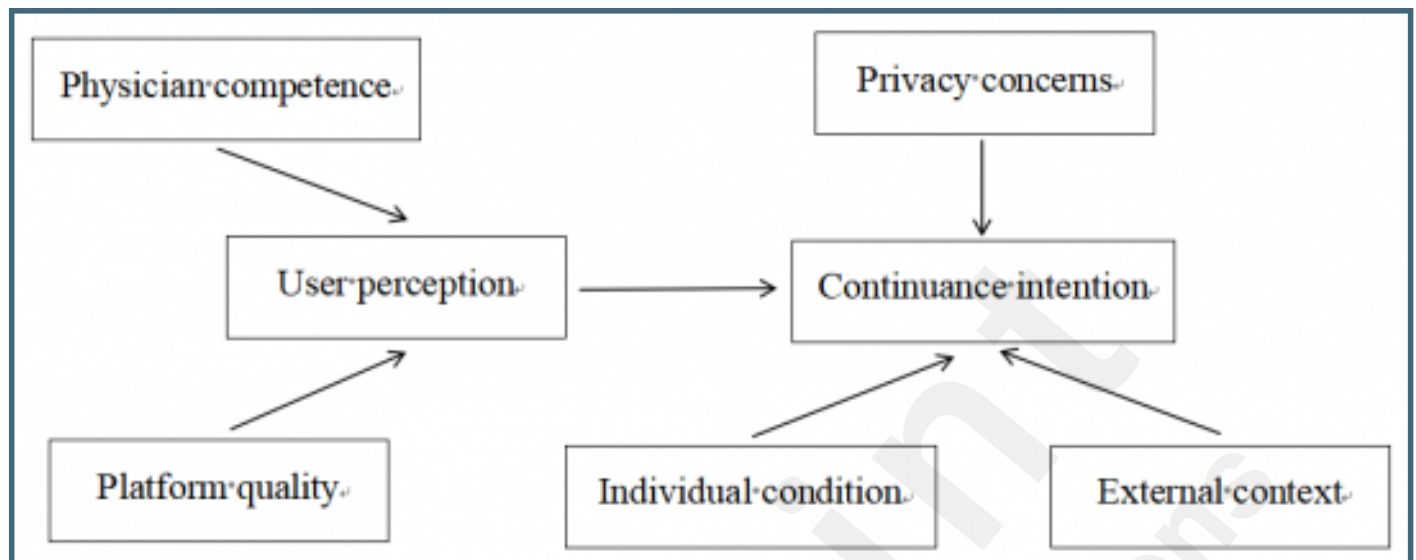
37. Smith, S., et al., *Four Conversations: A Randomized Controlled Trial of an Online, Personalized Coping, and Decision Aid for Metastatic Breast Cancer Patients*. Journal of palliative medicine, 2020.
38. Yang, M., et al., *Re-Examining the Impact of Multidimensional Trust on Patients' Online Medical Consultation Service Continuance Decision*. Information Systems Frontiers, 2021. **24**: p. 983-1007.
39. Adu, M., et al., *User Retention and Engagement With a Mobile App Intervention to Support Self-Management in Australians With Type 1 or Type 2 Diabetes (My Care Hub): Mixed Methods Study*. JMIR mHealth and uHealth, 2020. **8**.
40. Crafoord, M.-T., et al., *Engagement in an Interactive App for Symptom Self-Management during Treatment in Patients With Breast or Prostate Cancer: Mixed Methods Study*. Journal of Medical Internet Research, 2020. **22**.
41. Yan, M., et al., *Mobile apps for healthy living: Factors influencing continuance intention for health apps*. Technological Forecasting and Social Change, 2021. **166**: p. 120644.
42. Wang, T., et al., *Identifying major impact factors affecting the continuance intention of mHealth: a systematic review and multi-subgroup meta-analysis*. NPJ Digital Medicine, 2022. **5**.
43. Demoor-Goldschmidt, C. and B. Porro, *Editorial: Young adults or adults who are survivors of childhood cancer: psychosocial side effects, education, and employment*. Frontiers in Psychology, 2024. **15**.
44. Luo, X., et al., *Identifying the unmet needs of post-treatment colorectal cancer survivors: A critical literature review*. European journal of oncology nursing : the official journal of European Oncology Nursing Society, 2024. **70**: p. 102570.
45. Antoni, M., P. Moreno, and F. Penedo, *Stress Management Interventions to Facilitate Psychological and Physiological Adaptation and Optimal Health Outcomes in Cancer Patients and Survivors*. Annual review of psychology, 2022. **74**: p. 423-455.
46. Niu, Z., T. Bhurosy, and C. Heckman, *Cancer Survivors' Emotional Well-being: Roles of Internet Information Seeking, Patient-centered Communication, and Social Support*. Journal of Health Communication, 2021. **26**: p. 514-522.
47. Suarez, N., et al., *Connected and supported: a scoping review of how online communities provide social support for breast cancer survivors*. Journal of cancer survivorship : research and practice, 2024.
48. Magdy, M., et al., *Security of medical images for telemedicine: a systematic review*. Multimedia Tools and Applications, 2022. **81**: p. 25101-25145.

49. Zanke, P. and D. Sontakke, *Safeguarding Patient Confidentiality in Telemedicine: A Systematic Review of Privacy and Security Risks, and Best Practices for Data Protection*. International Journal of Current Science Research and Review, 2024.
50. Li, X. and Y. Cong, *A Systematic Literature Review of Ethical Challenges Related to Medical and Public Health Data Sharing in China*. Journal of Empirical Research on Human Research Ethics, 2021. **16**: p. 537-554.
51. Li, R., J. Shao, and D. Gao, *The impact of digital literacy on the health behavior of rural older adults: evidence from China*. BMC Public Health, 2025. **25**.
52. Ji, H., et al., *Associations between digital literacy, health literacy, and digital health behaviors among rural residents: evidence from Zhejiang, China*. International Journal for Equity in Health, 2024. **23**.
53. Zhang, H. and R. He, *A study on digital inclusion of Chinese rural older adults from a life course perspective*. Frontiers in Public Health, 2022. **10**.
54. Ziegler, E., et al., *Empowerment in cancer patients: Does peer support make a difference? A systematic review*. Psycho-Oncology, 2022. **31**: p. 683-704.

Supplementary Files

Figures

Theoretical model of influencing factors for continued utilization of online consultation among cancer survivors.



Multimedia Appendixes

Semi-structured interview guide.

URL: <http://asset.jmir.pub/assets/ba657c0b7e3f2b30729690f0184e6054.pdf>

Open coding concepts.

URL: <http://asset.jmir.pub/assets/6d0bd290d9a4cd33affb812fb5328224.xlsx>

