

# A Tailored Self-Management App to Support Older Adults with Cancer and Multi-Morbidities: Development and Usability Testing

Francis K. KOBEKYAA<sup>a,1</sup>, Sang-Wha SIEN<sup>a</sup>, Martine PUTS<sup>b</sup>, Leanne M. CURRIE<sup>a</sup>, Margaret TOMPSON<sup>a</sup>, Penelope HEDGES<sup>a</sup>, Joanna MCGRENERE<sup>a</sup>, Caroline MARIANO<sup>c</sup>, and Kristen R. HAASE<sup>a</sup>

<sup>a</sup>University of British Columbia, Vancouver, Canada

<sup>b</sup>Bloomberg Faculty of Nursing, University of Toronto, Toronto, ON

<sup>c</sup>BC Cancer, Vancouver

ORCID ID: Francis Kobekyaa <https://orcid.org/0000-0003-0927-6751>

**Abstract.** Cancer self-management interventions improve symptom management and confidence, but few interventions target the complex needs of older adults with cancer and multi-morbidities. Despite growing evidence of digital health tools in cancer care, many such tools have not been co-designed with older adults to ensure that they are tailored to their specific needs. The objective of the study was to design a self-and symptom-management app to support older adults with cancer and multi-morbidities. Utilizing a user-centered design thinking framework, we recruited 2 caregivers and 18 older adults with lived experiences of cancer to design a medium-fidelity app prototype. Participants highlighted the importance of tracking functions to make sense of the information about their symptoms, clear displays, and reminders to mitigate concerns related to polypharmacy. This app will create a 'home base' for symptom management and support for older adults with cancer and multi-morbidities.

**Keywords.** Cancer, aging, self-management, older adults, usability testing, design thinking

## 1. Introduction

Globally, cancer predominates in adults age 60+, and 70% of older adults have  $\geq 1$  chronic condition [1]. Having other chronic conditions alongside cancer in old age can lower one's functional status and increase the likelihood of treatment complications [1]. Given the possible treatment complications associated with cancer, OAs and their families require digital self-management support during the cancer care trajectory [2]. The aim of this study was to design a self-and symptom-management app to support older adults with cancer and multi-morbidities.

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<sup>1</sup> Corresponding Author: Francis Kobekyaa, RN, MN, University of British Columbia, T201-2211 Wesbrook Mall, Vancouver V6T2B5, BC, Canada, [kobekyaa@student.ubc.ca](mailto:kobekyaa@student.ubc.ca)

## 2. Methods

We used the Design Thinking model, involving a user-centered approach, with engagement from patient partners (co-design) as co-researchers. We recruited 2 caregivers and 18 OAs who were:  $\geq 65$  years of age; experiencing or had previously experienced cancer; had received cancer treatment within the previous year; and had at least one chronic illness in addition to the cancer that required the use of medication. The design process was highly iterative as we involved participants in needs assessment and usability testing in multiple waves to ensure that the design was user-validated at every step.

## 3. Results

We developed a medium-fidelity prototype with features: daily health reports, weekly health trends, schedule reminders; and share information. In the usability testing, participants emphasized the importance of tracking functions to make sense of information across symptoms; a clear display; and the organization of notes and reminders to communicate with care providers. Participants also emphasized the importance of medication initiation/cessation reminders to mitigate concerns related to polypharmacy. Overall, the prototype was well received by all participants.

## 4. Discussion

We present the findings of an iterative co-design and evaluation study of a cancer self-management app prototype designed specifically for the needs of OAs living with cancer and multimorbidity. Our study is novel as it acknowledges the complex health states that OAs living with cancer and multimorbidity experience and aim to address their challenges through an app that was co-designed with them, and for them.

## 5. Conclusions

This app will support the complex healthcare needs of older adults with cancer, creating a 'home base' for symptom management and support. Findings from this study will position the researchers to develop a functional app, conduct feasibility testing and real-world implementation.

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## References

- [1] Corbett, T., et al., *Self-management by older people living with cancer and multi-morbidity: a qualitative study*. Support Care Cancer, 2022. **30**(6): p. 4823-4833.
- [2] Haase, K.R., et al., *Systematic review of self-management interventions for older adults with cancer*. Psychooncology, 2021. **30**(7): p. 989-1008.