

# Assessing the Impact of a Patient Portal Application For Cancer Patients on Missed Appointments

Wanjin Li<sup>1</sup>, BMSc, Luc Galarneau<sup>2</sup>, PhD, John Kildea<sup>2,3</sup>, PhD, Alton Russell<sup>4</sup>, PhD

1. Department of Epidemiology, Biostatistics, and Occupational Health, McGill University 2. Medical Physics Unit - Gerald Bronfman Department of Oncology, McGill University 3. Research Institute of the McGill University Health Centre (RI-MUHC) 4. School of Population and Global Health, McGill University



## Abstract

**Objective:** We aimed to assess the initial impact of the use of a patient-centred portal on missed appointment rates among cancer patients.

**Methods:** We conducted a retrospective analysis to compare the differences in missed appointment (i.e., no-show) rates between portal users and non-users who had scheduled appointments at the Cedars Cancer Centre between May 31<sup>st</sup>, 2018, and July 29<sup>th</sup>, 2022 in Montréal, QC. We linked the portal data to patient-level data to match users and non-users using propensity score, controlling for patient demographic and clinical characteristics. We fit a logistic regression model to investigate the association between these covariates and portal use. Differences in no-show rates were compared using two-proportions Z-test.

**Results:** A total of 654 cancer patients were matched. Adequate balance between users and non-users was achieved after matching. Radiation oncology could predict a significantly higher odds (3.287,  $p < 0.01$ ) of patients being users. Age was associated with a lower odds (0.969,  $p < 0.01$ ). The overall no-show rate for portal users seemed lower compared to non-users (0.052 vs. 0.058, 95% confidence interval [-0.0125 to 0.0006],  $p = 0.076$ ). While the finding is not statistically significant with an alpha of 0.05, the confidence interval upper bound is close to zero.

**Conclusion:** Patient portal use may be associated with a modest decrease in patient no-show rate, but results are not statistically significant. Additional features like appointment reminders might lead to greater reductions in patient no-shows. We cannot disambiguate whether covariates predicting portal usage are due to self-selection or uneven roll-out. Fully assessing the impact of the patient portal will require considering more outcomes in larger patient populations.

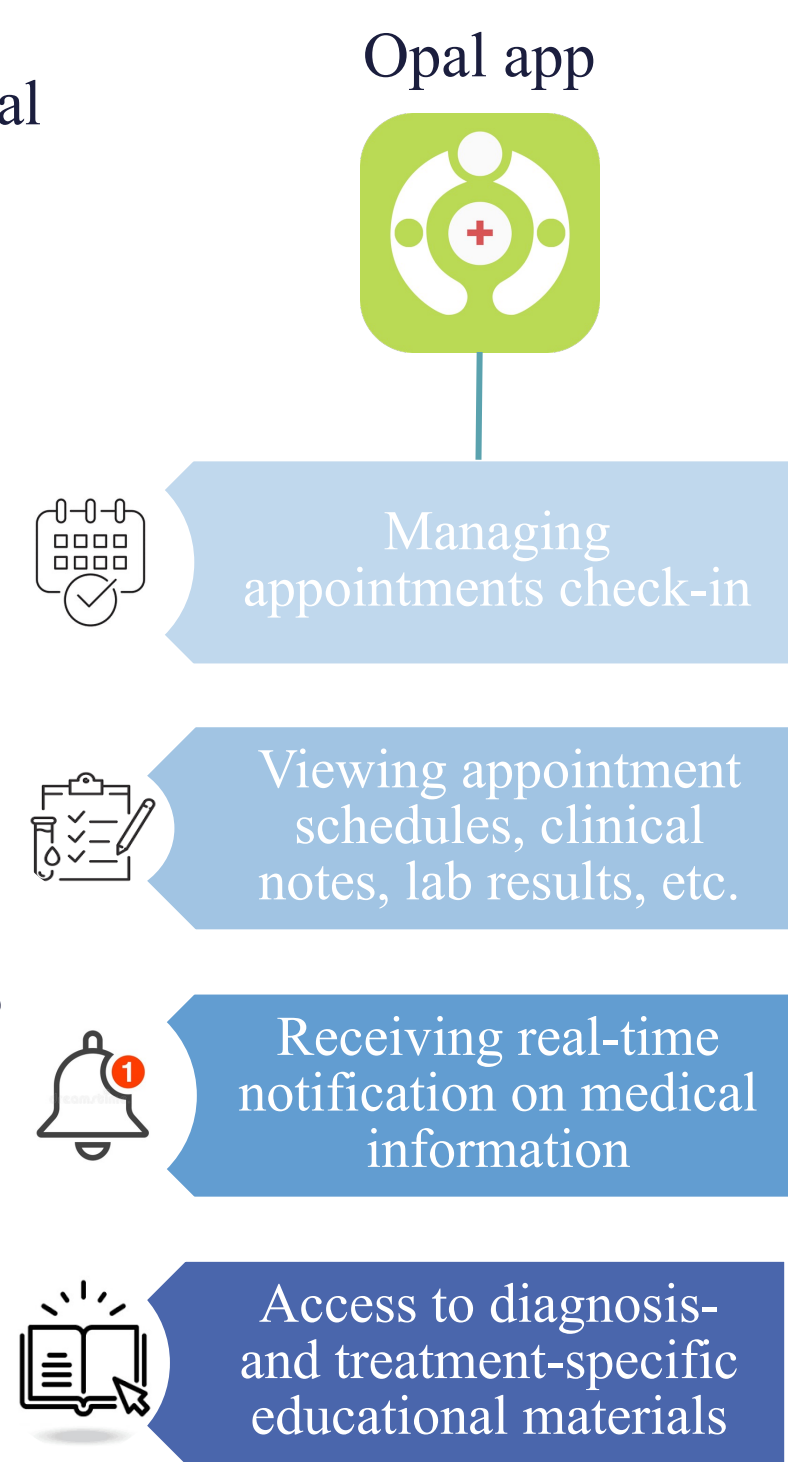
## Background

❖ Opal ([opalmedapps.com](http://opalmedapps.com)) is a novel patient-centred portal mobile application developed by the Opal Health Informatics Group (O-HIG) at the Research Institute of McGill University Health Centre (RI-MUHC) and funded by Quebec SmartCare Consortium (QSCC).

❖ Opal aims to provide Quebec and Canadian cancer patients with easily accessible personal health information, empowering them to actively engage in managing their healthcare and ultimately enhancing overall patient experience.

❖ A qualitative study has demonstrated Opal's potential to improve collaboration with care providers and to facilitate care coordination.<sup>1</sup>

❖ However, there has been no quantitative analysis conducted to assess the initial impact of Opal on operational efficiency, healthcare utilization, and cost savings in the organizational context.



## Objective

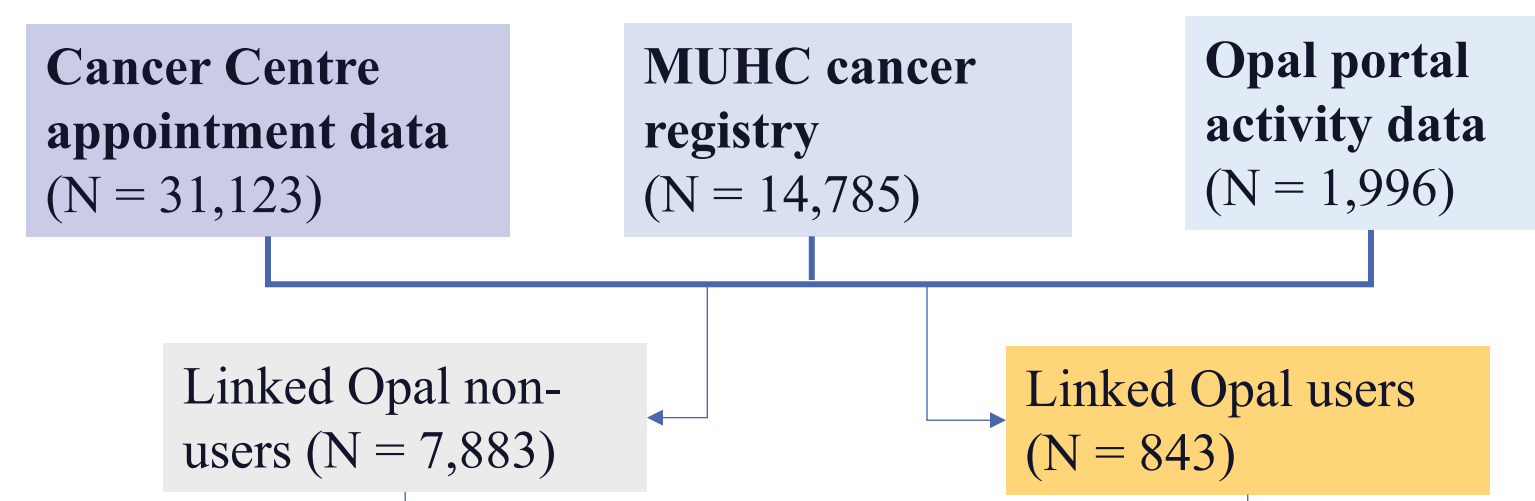
❖ This study aims to quantify the impact of the Opal patient portal on the missed appointment rates among Quebec cancer patients.

## Methods

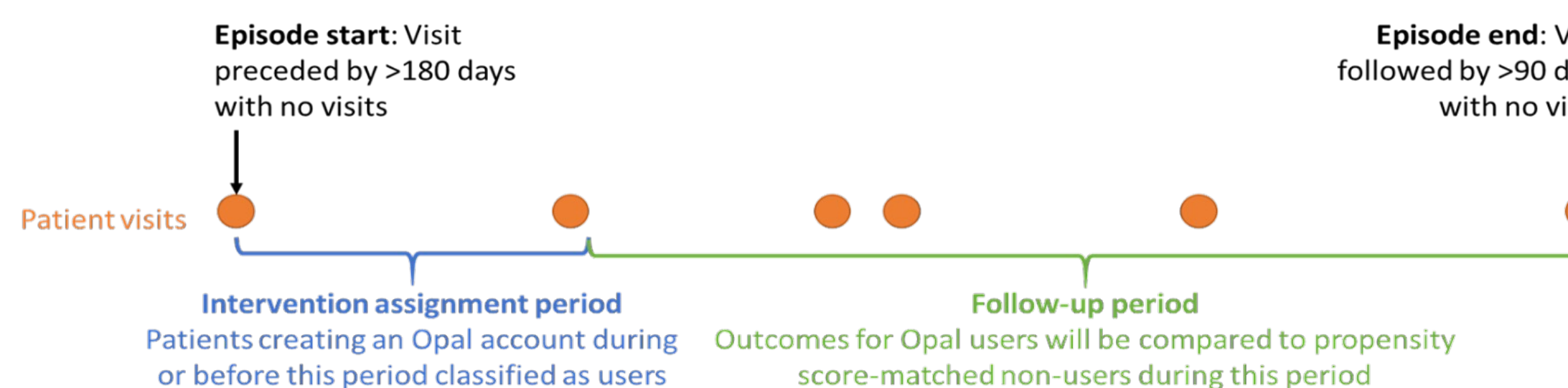
**Study design, setting, and participants:** A retrospective analysis was conducted to compare the rates of missed appointments between propensity-score matched Opal users and non-users who had scheduled appointments at the Cedars Cancer Centre of the MUHC (Montréal, Quebec, Canada) between May 31<sup>st</sup>, 2018 and July 29<sup>th</sup>, 2022.

### Cohort creation:

**Data linkage:** We leveraged patient-level data from multiple sources and performed data linkage based on Patient Medical Record Number (MRN).



**Episode construction:** We defined patients' care episodes as a series of consecutive visits to the Cancer Centre.



**Propensity score matching:** During the intervention assignment period, we performed 1:1 nearest neighborhood matching without replacement to match linked user and linked non-user episodes to control for:

- 1) Patient demographic variables: sex, age at episode start
- 2) Clinical characteristics: cancer diagnosis, treatment, progression, TNM staging
- 3) Episode-related variables: episode start time since first diagnosis, episode start time since the start of study analysis

### Statistical analyses:

- We employed a logistic regression model to examine the association between the probability of becoming an Opal user and the matched covariates.
- We used a two-proportions Z-test to compare the missed appointment rates during the follow-up period between the matched user and non-users.

## Preliminary results

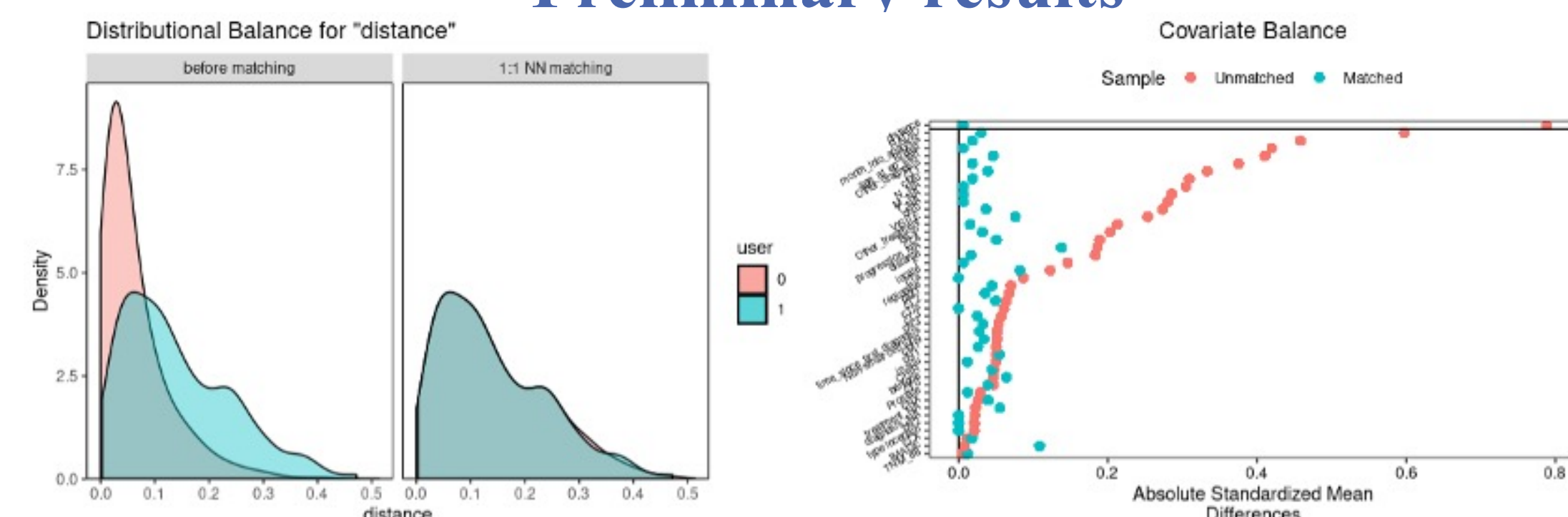


Figure 1. Distributional balance diagnostics between Opal users and non-users before and after propensity score matching.

- A total of 654 cancer patients were matched (327 users vs. 327 non-users). Adequate balance between users and non-users was achieved after matching (Figure.1).
- In the unmatched propensity score model, radiation oncology could predict a significantly higher odds (3.287,  $p < 0.01$ ) of patients being users. Age was associated with a lower odds (0.969,  $p < 0.01$ ).
- The overall missed appointment rate for Opal users seemed lower compared to non-users (0.052 vs. 0.058, 95% confidence interval (-0.0125, 0.0006),  $p = 0.076$ ).

## Discussion

❖ The usage of the Opal patient portal may potentially lead to a slight reduction in the missed appointment rate among cancer patients, although the finding is not statistically significant. It is unclear whether the factors that influence Opal use are due to self-selection or uneven implementation.

❖ To fully evaluate the impact of Opal, we plan to analyze additional outcomes (ER visits, hospitalization days, requests to medical records, etc.) in larger patient groups in future analyses. Additionally, we are also collecting data from a waiting room survey to provide further insights beyond the retrospective analysis.

### References

1. Mohsen K, Kildea J, Lambert SD, Laizner AM. Exploring Cancer Patients' Perceptions of Accessing and Experience with Using the Educational Material in the Opal Patient Portal. Support Care Cancer. 2021 Aug;29(8):4365-74.

### Acknowledgement

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