










## ORIGINAL ARTICLE

# Patient preferences using telehealth during the COVID-19 pandemic in four Victorian tertiary hospital services

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## Key words

COVID-19, telemedicine, hospital, quality of healthcare, patient preference, Australia.

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## Abstract

**Background:** The Coronavirus disease 2019 (COVID-19) pandemic has had a major impact on healthcare services with many changes to telehealth care delivery. More information is needed about the patient perspective of telehealth in hospital services and the potential costs and benefits for patients.

**Aim:** To measure patients' evaluation of telehealth, preferences for telehealth versus in-person appointments, and potential cost savings by patient characteristics.

**Methods:** A cross-sectional online survey (including patient and appointment characteristics, telehealth evaluation, preferences for care and costs) of adult patients using video telehealth in four metropolitan tertiary hospital services in Melbourne, Victoria.

**Results:** A total of 1045 patients (median age 44 years; interquartile range 29–59) participated with an overall response rate of 9.2%. For 98.7% patients, telehealth was convenient, 96.4% stated that it saved time, 95.9% found telehealth acceptable to receive care and 97.0% found that telehealth improved their access to care. Most (62.6%) preferred in-person consultations, although 86.9% agreed that telehealth was equivalent to an in-person consultation. Those in regional and rural areas were less likely to prefer in-person consultations. Patients attending for medical reasons were less likely to prefer in-person consultation compared with patients with surgical reasons. Patient preference to telehealth was independent of level of education, appointment type, self-rated health status and socio economic status. Patients saved an average of A\$120.9 (standard deviation A\$93.0) per appointment, with greater cost savings for patients from low and middle socio economic areas and regional or rural areas.

**Conclusion:** Telehealth video consultations were largely evaluated positively with most patients considering the service to be as good as in-person. Understanding patient preference is critical to consider when implementing telehealth as mainstream across hospital health services.

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**Conflict of interest:** None.

## Introduction

The Coronavirus disease 2019 (COVID-19) pandemic has had a major impact on healthcare services with many changes to healthcare delivery.<sup>1</sup> Telehealth (TH) is a broad term referring to the delivery of healthcare via technology, such as telephone or Internet,<sup>2</sup> enabling the delivery of healthcare beyond the physical environment to alternative locations, such as local clinics or directly to the client at a location of their choice.<sup>3</sup>

To reduce the risk of COVID-19 transmission, the majority of healthcare services shifted to being delivered via TH.<sup>4</sup> On 13 March 2020, the Australian Government introduced new TH item numbers for patients, allowing for telephone or video TH consultations to be reimbursed by Medicare.<sup>4</sup> This led to a rapid growth in the provision of TH in healthcare services<sup>5</sup> with well documented benefits for patients.<sup>6–9</sup> TH may remove barriers to accessing healthcare, such as time to travel, travel expenses, time taken off work, socio economic, and mitigate social and cultural barriers.<sup>10</sup> The potential benefits and challenges of further expanding implementation of TH have been well documented in primary care<sup>11</sup> and rehabilitation settings after acute interventions with high patient and carer satisfaction.<sup>7,8</sup> However, these studies were limited by poor study design, small target populations, and most studies were conducted in primary care.<sup>6,10</sup> More information is needed about the patient perspective of TH in hospital services,<sup>10</sup> and the potential costs and benefits for patients.<sup>6,12</sup>

The aim of this study was to measure patients' evaluations of TH and preferences for video TH versus in-person hospital outpatient appointments, associated patient characteristics and costs in four metropolitan tertiary hospitals in Melbourne, Australia.

## Methods

### Study design and setting

Data were collected as part of a cross-sectional multi-site study of patients' views on TH. An anonymous survey was offered to all patients participating in video TH at four metropolitan tertiary hospital services in Melbourne, Victoria: Melbourne Health (MH), Peninsula Health (PH), The Royal Women's Hospital (RWH) and Western Health (WH).

The survey was open to patients between 6 August 2020 and 21 September 2020 (PH and WH) or 17 August 2020 and 21 September 2020 (MH and RWH). Patients were sequentially recruited to allow for a broad sampling of the type of patients using TH. Exclusion criteria were

patients aged 17 years and younger and telephone-only consultations.

### Survey

Information about the survey was offered at the end of the video consultation with a link to the anonymous questionnaire consisting of 30-items with an estimated completion time of 15 min. The survey included 14 questions on patient and appointment characteristics, 8 questions on TH evaluation, 5 questions on preferences for care and 3 cost questions. Patient characteristics included gender, Aboriginal and Torres Strait Islanders status, main language spoken at home, highest level of education, Index of Relative Socioeconomic Advantage and Disadvantage<sup>12</sup> and remoteness (stratified by regional/rural and metropolitan) derived from postcode using data available from the 2016 Australian census<sup>13</sup> and self-rated health. Appointment characteristics included reason for the visit, new versus review consultation, having had a previous TH consultation, and if TH was chosen by the patient.

The TH evaluation and preferences for care questions were adapted from the Telehealth Usability Questionnaire<sup>14</sup> and Agency for Clinical Innovation Patient Evaluation Survey.<sup>15</sup> Cost questions were adapted from those used in previous studies and shown to be validated measures of patient-reported costs.<sup>16,17</sup> Sample characteristic questions were adapted from a previously published study.<sup>17</sup> A choice of 'prefer not to answer' was given for the questions. For analyses purposes, prefer not to answer were grouped together with missing data.

### Data collection and statistical analysis

Data were collected and stored in REDCap.<sup>18</sup> Data were cleaned and analysed using Stata (version 16.0; College Station, TX, USA). Normally distributed data are summarised as mean and standard deviation (SD) and non-normally data as median and interquartile ranges (IQR). Categorical data are described with overall frequency and percentage.

### Response rate

To calculate response rate, de-identified data on video consultations were extracted from the video TH platform (Healthdirect). Consultations that were abandoned (as specified by Healthdirect), cancelled (only one participant in the call), with a duration of  $\leq 2$  min or with technical difficulties (insufficient audio quality and connectivity, and switch from TH to telephone) were excluded.

## Cost analysis

Costs of paid and unpaid time and costs of transportation were considered. Cost savings on time were calculated from patient self-reported time saved from the TH consultation and how that time would normally have been spent (i.e. in a paid or unpaid work). Unpaid time was included in the analysis as it has been long recognised that an individual's time is a scarce resource and hence has economic value.<sup>19</sup> The paid time was estimated based on Australian average wages in 2020 (\$1558.40 per week for female; \$1812.00 per week for male).<sup>20</sup> Unpaid time was estimated based on the 2020 Australian minimum wage (\$19.84 per hour).<sup>21</sup> Costs saved on transport were estimated based on patient self-reported travel mode to hospital (i.e. personal car or public transport). For patients who would normally drive to the physical hospital consultation, distance from the household to the hospital was measured using home and hospital postcodes. The Australian Taxation Office rate was used as unit cost (\$0.72 per km).<sup>22</sup> Parking fees were reported by the patients in the survey. For patients who usually travelled to appointments on public transport, the close travel zone in metropolitan Melbourne rate was applied (\$9.00). Costs are reported in Australian 2020 dollars.

## Ethics approval

The study was approved by the ethics committee at the Royal Children's Hospital HREC (Project number: 64852) and subsequently approved by the participating sites.

## Results

The four health services delivered a total of 17 301 Healthdirect videocalls during the data collection period. Of those, 3359 (19.4%) were abandoned and 1377 (8.0%) were cancelled, leaving a total of 12 565 calls. Of the 12 565 calls, calls of ≤2 min duration were excluded (1180; 9.4%), leaving 11 385 calls, of which in 1045 cases surveys

**Table 1** Response by health services

| Health service       | Connected calls (n) | Finalised surveys (n) | Response (%) |
|----------------------|---------------------|-----------------------|--------------|
| Peninsula Health     | 1857                | 97                    | 5.2          |
| The Women's Hospital | 836                 | 28                    | 3.3          |
| Melbourne Health     | 6618                | 825                   | 12.5         |
| Western Health       | 2074                | 95                    | 4.6          |
| Overall              | 11 385              | 1045                  | 9.2          |

**Table 2** Patient characteristics

| Characteristic                            | n          | %       |
|---|------------|---------|
| Age, median (range) [IQR] (years)         | 44 (17–90) | [29–59] |
| Gender (n = 999)                          |            |         |
| Male                                      | 414        | 41.4    |
| Female                                    | 565        | 56.6    |
| Other                                     | 8          | 0.8     |
| Prefer not to answer                      | 12         | 1.2     |
| Background (n = 998)                      |            |         |
| Aboriginal and Torre Strait Islanders     | 10         | 1.0     |
| Other                                     | 933        | 93.5    |
| Prefer not to answer                      | 55         | 5.5     |
| Language spoken at home (n = 997)         |            |         |
| English                                   | 881        | 88.4    |
| Other                                     | 104        | 10.4    |
| Prefer not to answer                      | 12         | 1.2     |
| Highest level education (n = 998)         |            |         |
| Secondary school or less                  | 251        | 25.2    |
| Trade or other certificate                | 239        | 23.9    |
| Bachelor degree                           | 254        | 25.5    |
| Postgraduate qualification                | 212        | 21.2    |
| Prefer not to answer                      | 42         | 4.2     |
| Remoteness (n = 876)                      |            |         |
| Regional and rural                        | 122        | 13.9    |
| Metropolitan                              | 754        | 86.1    |
| IRSAD (n = 874)                           |            |         |
| Low                                       | 154        | 17.6    |
| Middle                                    | 309        | 35.4    |
| High                                      | 411        | 47.0    |
| Self-rated health (n = 999)               |            |         |
| Poor/Fair/Good                            | 628        | 62.9    |
| Very good/Excellent                       | 355        | 35.5    |
| Prefer not to answer                      | 16         | 1.6     |
| Reason for visit (n = 998)                |            |         |
| Medical                                   | 430        | 43.1    |
| Surgical                                  | 114        | 11.4    |
| Mental health, alcohol and drug           | 137        | 13.7    |
| Cancer                                    | 36         | 3.6     |
| Women's health                            | 16         | 1.6     |
| Multiple concerns                         | 38         | 3.8     |
| Other concerns                            | 179        | 17.9    |
| Prefer not to answer                      | 48         | 4.8     |
| Type of consultations (n = 1040)          |            |         |
| New                                       | 340        | 32.7    |
| Review                                    | 668        | 64.2    |
| Unsure                                    | 24         | 2.3     |
| Prefer not to answer                      | 8          | 0.8     |
| Previous telehealth experience (n = 1042) |            |         |
| Yes                                       | 683        | 65.5    |
| No  | 352        | 33.8    |
| Unsure                                    | 4          | 0.4     |
| Prefer not to answer                      | 3          | 0.3     |
| Why did you choose telehealth? (n = 1041) |            |         |
| Didn't choose telehealth                  | 619        | 59.5    |
| Reduced risk contracting Covid-19         | 73         | 7.0     |
| Reduce travel time and cost               | 14         | 1.3     |
| Difficulty with travel due to illness     | 4          | 0.4     |

**Table 2** *Continued*

| Characteristic                                    | <i>n</i> | %    |
|---|----------|------|
| Reduced burden on family members or carers        | 1        | 0.1  |
| Satisfied with a previous telehealth consultation | 3        | 0.3  |
| Curiosity   | 2        | 0.2  |
| Multiple  | 313      | 30.1 |
| Other   | 7        | 0.7  |
| Prefer not to answer                              | 5        | 0.5  |

IQR, interquartile range; IRSAD, Index of Relative Socioeconomic Advantageous and Disadvantageous.

were completed (overall response rate of 9.2%). Table 1 shows the response rate per health service.

## Patients

Patient characteristics are shown in Table 2. Age ranged 17–90 years, and the median age of patients who completed the survey was 44 years (IQR 29–59).

## Telehealth evaluation

The vast majority of patients agreed that TH was convenient and saved them time. Almost all felt comfortable with using the TH platform and agreed that joining the call was easy. Likewise, almost all agreed that their safety and privacy was maintained and that TH gave them the

opportunity to ask questions about their care. Most participants reported that their questions and concerns about their health condition were adequately addressed in their TH consultation (Table 3).

## Preferences for care

Most patients agreed that TH is an acceptable way to receive healthcare services and improved access to care. Almost all patients would prefer to have the option of a TH consultation. When asked to choose their preferred consultation method, 62.6% preferred in-person consultations over TH. However, 86.9% of patients reported that TH consultations were ‘as good as’ an in-person appointment.

Evaluation of TH and preferences for care were largely consistent across sub-groups (Supporting Information Table S1).

## Cost analysis

Most (95.3%) patients agreed that the TH appointment saved them time; 50.5% said it save them more than 2 h. Costs saved by these patients averaged \$120.9 (SD \$93.0; Table 4). Cost savings associated with time were greater for patients living in low- and middle-socioeconomic areas and regional or rural areas compared with those in high-socioeconomic and metropolitan areas.

In the group of patients who provided their usual travel mode to hospital ( $n = 897$ ), most patients would

**Table 3** Telehealth (TH) evaluation of the total group

| Question   | <i>N</i> | Agree    |      |
|--|----------|----------|------|
|  |          | <i>n</i> | %    |
| The TH appointment was convenient for me   | 1041     | 1027     | 98.7 |
| The TH appointment saved me time   | 1033     | 996      | 96.4 |
| I was comfortable using the TH technology  | 1039     | 1013     | 97.5 |
| Joining the TH call was easy for me  | 1042     | 1014     | 97.3 |
| My safety and privacy were maintained during the consultation  | 1042     | 1018     | 97.7 |
| TH is an acceptable way to receive healthcare services   | 1025     | 983      | 95.9 |
| TH improves access to healthcare services  | 1015     | 985      | 97.0 |
| I would prefer to have the option of a TH consultation when I need it  | 1015     | 955      | 94.1 |
| I prefer an in-person consultation over TH   | 959      | 600      | 62.6 |
| The TH service gave me the opportunity to ask questions about my care  | 1018     | 1002     | 98.4 |
| I felt that my questions or concerns about my health condition(s) were adequately addressed during this TH service | 1024     | 1001     | 97.8 |
| The TH service I received was as good as an in-person appointment  | 1002     | 871      | 86.9 |

**Table 4** Cost saved on time and transport per telehealth appointment, by Index of Relative Socioeconomic Advantageous and Disadvantageous (IRSAD) and remoteness

|                 | Cost saved on time (A\$) |       |       | Cost saved on transport (A\$) |       |       |
|-----------------|--------------------------|-------|-------|-------------------------------|-------|-------|
|                 | <i>n</i>                 | Mean  | SD    | <i>n</i>                      | Mean  | SD    |
| IRSAD           |                          |       |       |                               |       |       |
| Low             | 146                      | 173.5 | 124.3 | 138                           | 135.3 | 162.6 |
| Middle          | 296                      | 126.3 | 97.8  | 273                           | 62    | 71.8  |
| High            | 389                      | 101.6 | 69.6  | 343                           | 28.5  | 34.8  |
| Remoteness      |                          |       |       |                               |       |       |
| Regional, rural | 119                      | 239.7 | 128.3 | 108                           | 229   | 154.2 |
| Metropolitan    | 714                      | 103.9 | 72.3  | 648                           | 32.1  | 25.6  |

SD, standard deviation.

have driven to the hospital appointments with a personal carer ( $n = 626$ ; 69.8%) and the rest would have used public transport ( $n = 271$ ; 30.2%). The median distance for those who drove was 19.1 km (IQR 9.2–45.0) each way. The average cost saving for these patients was \$55.5 (SD \$86.5) per person per appointment. Cost savings associated with travel were greater for patients living in low- and middle-socioeconomic areas and regional or rural areas compared with those in high-socioeconomic and metropolitan areas.

## Discussion

This is the first study to report patient perspectives on TH across a broad range of conditions and socioeconomic status. Overall, most patients reported that TH was highly convenient with considerable savings in cost and time by increased access and use of technology, satisfied with their care and considered TH to be equivalent to an in-person consultation. Subgroup analyses did not show any significance differences between groups.

The reason for attending a consultation was often associated with patient preference for TH; hence, patients' preferences are an important consideration in healthcare delivery planning. Our finding that certain patients prefer in-person appointments over TH should be considered while planning and delivering care. Our main study finding of patients' overall positive experience in using TH is consistent with other similar Australian studies<sup>5,23</sup> as well as international studies.<sup>10,24</sup> An Australian national cross-sectional survey<sup>23</sup> found that more than half ( $n = 369$ ; 61.9%) of the respondents stated that their TH experience was 'just as good as' or 'better than' their traditional in-person medical care experience. In addition, also aligned with our finding, the study<sup>23</sup> evidenced that people having a history of both depression and anxiety had a poorer experience using TH compared with in-person consultation. However, our other findings that patients'

socioeconomic status, education levels or self-perceived health status were not associated with preferences for in-person consultations differ from this study,<sup>23</sup> which indicated that patients who used TH services had higher levels of education and had poorer self-reported general health compared with those who did not use TH services. The latter might be related to a smaller population ( $n = 596$ ) compared with our population ( $n = 999$ ); however, in our study, 628 (62.9%) patients indicated poor/fair/good health compared with 374 (52.7%) patients.<sup>23</sup> This difference might also be explained by our population being recruited within our services compared with the general Australian public in the national survey.

Understanding patient preference to how best to provide tertiary care considering both in-person and TH is critical for future healthcare delivery. Planning of TH service beyond the pandemic in tertiary care is likely to be a priority for governance, policy-makers and clinicians as the Australian Government is subsidizing TH permanently<sup>4</sup> in future healthcare delivery planning.

## Strengths and limitations

The main limitation was an overall low response rate and survey participation was self-selective, and the overall response rate was low, therefore the representativeness of the sample cannot be fully assessed. As for all online surveys, those with lower computer proficiency or English fluency or without Internet access may have been under-represented. There is potentially an overestimation of positive experiences from patients who have successfully used video TH. Considering that most responses were from one centre, this might 'dilute' some of the responses from other hospital service. The focus in this study is on consultations and given TH is also used for delivering therapy such as thrombolysis, chemotherapy and clinical trials, this could be a limitation. No conclusion could be drawn for

Aboriginal and Torres Strait Islander patients and patients referred with cancer and women's health concerns due to their low numbers.

### Implications for health policy and practice

As TH services continue to be integrated in hospital service delivery,<sup>25</sup> it is important for policy-makers to consider patients' preferences in use of TH compared with in-person service across different patient groups beyond the pandemic. Importantly, TH increases access for many patients through reducing patient costs associated with time and travel. Patient preferences for TH need to be evaluated on an ongoing basis to inform provision of TH that meets the needs of different patient groups and possibly provide choice for patients between in-person and TH service.

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### Conclusion

Overall, patient satisfaction engaging with TH consultation is high relative to the low response rate. Understanding patient preference on how best to provide tertiary care considering both in-person and TH is critical when health services consider the implementation of TH as mainstream across hospital health services. Treatment and care planning must be based on patient preferences and designed to meet individual needs and circumstances, for example, language barriers, to try to minimise barriers when using TH.

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## Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web-site:

**Table S1.** Telehealth evaluation by sub-group.

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