



A study in patient satisfaction regarding telemedicine consultations in radiation oncology

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Abstract

Introduction: Telemedicine consultations can be a cost-effective and convenient method of communication, particularly with patients living in remote areas. Given the dearth of patient-reported satisfaction data with this form of consultation in Radiation Oncology, we surveyed patients to assess this in our department. **Methods:** The study recruited patients who had experienced both a Telemedicine consultation and an in-person consultation with the same radiation oncologist at our tertiary centre in South Australia. Eligible patients were identified from the Royal Adelaide Hospital oncology information system. The patient satisfaction questionnaire was sent via registered post with a reply-paid envelope. The questionnaire consisted of 38 questions divided into four major categories, focusing on communication, medical care, privacy/confidentiality and convenience. Results of the survey were tabulated in an excel spreadsheet. **Results:** Between 1 January 2018 and 1 January 2019, 130 eligible patients were identified. One hundred and nine patients were alive and contactable of whom 37 responded (34%). Two surveys were returned incomplete resulting in 35 patient responses available for analysis. The median age was 70 years (range 35–87); 74% were male. There was no statistically significant difference between the satisfaction scores for Telemedicine and in-person consultations with regards to communication, privacy/confidentiality or overall satisfaction. The respondent felt it was more important to be examined when the consultation was conducted in-person and found Telemedicine consultations more convenient in terms of cost and time. **Conclusion:** Telemedicine used in Radiation Oncology is an effective form of consultation that is convenient, provides a similar level of patient satisfaction and maintains patient confidentiality. Telemedicine consultations should therefore be considered for all rural and remote cancer patients where feasible.

Introduction

Cancer outcomes among patients in rural and remote regions of Australia differ significantly in terms of survival and cancer treatments compared to patients in metropolitan or urban regions. The inequality in cancer care outcomes is well documented with many factors contributing to the continued disparity.¹ Amongst the many factors, access to tertiary centres and accessibility to specialist services, remain difficult to resolve due to geography. Although cancer mortality rates have

continued to decline and survival rates have increased, cancer still accounts for approximately three of every ten deaths in Australia.² Based on the 2016 census, 28% of the Australian population live outside major cities and are classified as ‘rural and remote’,³ the majority of whom report not having a specialist nearby as a barrier to primary care.⁴ Many patients in rural and remote locations also have limited access to specialist cancer care, particularly in relation to Radiation Oncology services, and often must travel great distances to tertiary centres. This can be associated with significant expenses and

disruption to daily activities which ultimately impact on quality of life.⁵

Telemedicine or Telehealth is a broad term to incorporate any form of medical advice/consultation/activity or health service using telecommunication over distance. Telemedicine offers rural and remote patients the ability to consult with their specialist from the convenience of their hometown or closest regional centre by utilising video technology. Telemedicine services and consultations are already widely used in many other disciplines, particularly in the fields of mental health, cardiology and rehabilitation. There continues to be a need to improve patient access to a range of clinical services otherwise not offered in their locality. Cancer services including Medical Oncology and Radiation Oncology services are still underrepresented. Telemedicine has the potential to be a simple and cost-effective platform to improve specialist cancer care services to rural and remote patients, thereby minimising the inconvenience, time and cost required to travel to a tertiary centre.

As radiation therapy centres are mostly located in metropolitan areas or larger regional centres and approximately a third of Australia's population residing in regional and remote areas,⁶ it is important to improve access to Radiation Oncology services and specialist review. On average, there is a 6% increase in mortality risk for each 100 km increment in distance from the nearest Australian radiotherapy centre.⁷ This disparity is comparable to other studies which found a 7% increase in mortality in cancer outcomes between urban and rural patients.⁸ Given one in every two cancer patients will likely require radiotherapy at some stage, Telemedicine consultations provide a convenient and cost-effective method⁹ of improving access that hopefully leads to improved oncological outcomes.

South Australia is the fourth largest state in Australia with a total land size approaching 1 million square kilometres with about a quarter of the population living in rural regions outside the major metropolitan area of Adelaide. Large population regional areas and patients from bordering interstate towns such as Broken Hill and Mildura often receive care in Adelaide due to proximity, whilst those living in the Northern Territory requiring specialised radiation techniques such as stereotactic treatments or brachytherapy also commonly access these services in Adelaide. There is currently no Radiation Oncology facility or department outside of the metropolitan city of Adelaide in the public or private sector. Given the current geographical distribution of radiation therapy services in South Australia, it is imperative for a more convenient and simple solution to help rural and remote communities.

Telemedicine consultations in the Radiation Oncology Department at the Royal Adelaide Hospital were introduced in 2016 as part of the South Australian Digital Telehealth Network expansion. This network was formed in 2012 having initially been implemented by Country Health SA Local Health Network to facilitate remote mental health service consultations.¹⁰ Since its introduction to our department, a minority of consultations have been conducted via Telemedicine because of the slow adoption of this new model of care by clinicians.

A recent review of a Telehealth model in Radiation Oncology set up in Queensland, examined patients' experience and satisfaction with their model. This study demonstrated an overall high level of satisfaction with the service and advocated for further funding and advancement.¹¹ However, to strongly suggest Telemedicine consultations are a valid alternative to in-person consultations, we felt it necessary to compare the patients' experiences and satisfaction level with a similar consultation they had with an in-person consultation.

This study assessed the experience and satisfaction of rural and remote patients undergoing Radiation Oncology Telemedicine consultations in our department and compared this against their experience with in-person consultations. To the best of our knowledge, this is the first such assessment undertaken that compared in-person and Telemedicine consultations and the second Australasian survey regarding Telemedicine consultations in the field of Radiation Oncology.

Methods

Study design

Our study was conducted at the Royal Adelaide Hospital. Telemedicine consultations were conducted via desktop computer, laptop or tablet in a dedicated clinic room with the availability of a suitable internet connection and audio/visual equipment via Cisco Webex Teams software. The consultations provided by one radiation oncologist were selected for inclusion so as to eliminate the consultant's identity as a confounding variable in our study.

Participants

Eligible patients for our study were identified from the Royal Adelaide Hospital oncology information system. This required the patients to have undergone both a Telemedicine consultation as well as an in-person consultation at some point during cancer management with the same radiation oncologist at the Royal Adelaide

Hospital between 1 January 2018 and 1 January 2019. Consultations could either be in the form of an initial consultation or a follow-up consultation. The questionnaire was sent to eligible patients via registered post with a reply-paid envelope.

Procedures

The questionnaire consisted of 38 questions divided into four major categories focusing on communication, medical care, privacy/confidentiality and convenience (Tables 1–4). Overall satisfaction (Table 5), Telemedicine specific questions (Table 6) and general qualifying questions regarding patients' experiences with other forms of technology (Table 7) were also surveyed. Once developed, the survey was sampled on a number of patients before implementation to evaluate the effectiveness and understanding of the questions asked, and modified accordingly. The survey is included in [Supporting Information](#).

Statistical analysis

Each question was reported on a Likert scale (0–5, with 5 representing the most favourable response) and directly compared the patients' experience with Telemedicine consultations against that of the in-person consultations. Results were then tabulated centrally on an excel spreadsheet. The Wilcoxon Paired Rank sum test was used to compare summary scores between the two intervention groups. The sample size of 35 participants would guarantee 80% statistical power for detecting

medium effect size, which in our case means detecting a difference of 1 unit between average group scores, assuming a standard deviation of 1 unit and significant level $\alpha = 0.05$ (determined by G*Power Version 3.1.9.6).

Ethics/Funding

The research was sponsored in kind by the Royal Adelaide Hospital. The wages of the people involved in this study were not paid by any external sponsors. This study was approved by the Central Adelaide Local Health Network Human Research Ethics Committee on 27 March 2019 (Reference: R20160828, HREC/16/RAH/443).

Results

Between 1 January 2018 and 1 January 2019, 130 eligible patients were identified. Twenty patients were deceased and 1 patient was uncontactable. The remaining 109 patients were sent surveys, of whom 37 responded, giving a response rate of 34%. Two surveys were returned incomplete resulting in 35 patient responses available for analysis.

Demographics

The median age of respondents was 70 years (range 35–87); 74% were male. Eighty-eight percent reported no impairment of hearing or vision. There were no non-English speaking patients. Lung cancer was the most common cancer type (31%), followed by cancer of the

Table 1. Communication.

Question	Consultation	Mean (SD)	Median (IQR)	Wilcoxon Rank Sum test <i>P</i> -value
Q1 - I understood what the specialist told me regarding my medical issues	In-person	4.58 (0.50)	5 (1)	0.77
	Telemed	4.59 (0.50)	5 (1)	
Q2 - I had no issue or problem with hearing or seeing the specialist	In-person	4.58 (0.50)	5 (1)	1
	Telemed	4.53 (0.72)	5 (1)	
Q3 - I felt the specialist maintained a professional relationship	In-person	4.74 (0.44)	5 (0.5)	1
	Telemed	4.72 (0.46)	5 (1)	
Q4 - I was able to establish a rapport (mutual trust/understanding) with the specialist	In-person	4.65 (0.49)	5 (1)	0.42
	Telemed	4.55 (0.57)	5 (1)	
Q5 - I was able to explain my physical and medical issues to the specialist	In-person	4.67 (0.48)	5 (1)	0.77
	Telemed	4.58 (0.62)	5 (1)	
Q6 - I felt comfortable expressing my physical and medical issues	In-person	4.63 (0.49)	5 (1)	0.77
	Telemed	4.55 (0.57)	5 (1)	
Q7 - I was able to explain my emotional/psychological/social issues to the specialist	In-person	4.48 (0.51)	4 (1)	0.23
	Telemed	4.39 (0.69)	4.5 (1)	
Q8 - I felt comfortable expressing my emotional/psychological/social issues	In-person	4.50 (0.51)	4.5 (1)	0.2
	Telemed	4.38 (0.78)	5 (1)	

Table 2. Medical care.

Question	Consultation	Mean (SD)	Median (IQR)	Wilcoxon Rank Sum test P-value
Q9 - I felt it was important for the specialist to physically examine me	In-person	3.81 (1.27)	4 (2)	0.024
	Telemed	3.05 (1.39)	3 (2.5)	
Q10 - I felt the relevant test results (blood test/imaging) were presented or discussed adequately	In-person	4.58 (0.50)	5 (1)	1
	Telemed	4.53 (0.51)	5 (1)	
Q11 - I understood the role, rationale and logistics involved in the planning and delivery of the radiotherapy plan in my circumstance	In-person	4.47 (0.57)	4.5 (1)	0.77
	Telemed	4.43 (0.69)	5 (1)	
Q12 - I felt comfortable expressing potential side effects from my Radiotherapy treatment	In-person	4.53 (0.51)	5 (1)	0.37
	Telemed	4.40 (0.72)	4.5 (1)	
Q13 - How satisfied were you that the consultation met your medical care expectations?	In-person	4.61 (0.50)	5 (1)	0.27
	Telemed	4.53 (0.72)	5 (1)	
Q14 - How satisfied were you with the overall quality of care you received?	In-person	4.68 (0.83)	5 (0)	1
	Telemed	4.76 (0.56)	5 (0)	
Q15 - I felt comfortable giving consent to radiotherapy treatment	In-person	4.61 (0.56)	5 (1)	1
	Telemed	4.57 (0.59)	5 (1)	

Table 3. Privacy/confidentiality.

Question	Consultation	Mean (SD)	Median (IQR)	Wilcoxon Rank Sum test P-value
Q16 - I felt I was able to talk and ask/answer questions freely to the specialist	In-person	4.69 (0.47)	5 (1)	0.09
	Telemed	4.52 (0.67)	5 (1)	
Q17 - I felt it was safe to discuss my medical/physical issues or concerns	In-person	4.52 (0.96)	5 (1)	0.17
	Telemed	4.39 (0.97)	5 (1)	
Q18 - How satisfied were you that your privacy and confidentiality were preserved during the consultation?	In-person	4.66 (0.48)	5 (1)	0.77
	Telemed	4.59 (0.56)	5 (1)	

head and neck (23%), prostate (20%), central nervous system (9%) and other sites including skin and gastrointestinal.

Communication (Table 1)

Each of the 7 questions revealed high levels of satisfaction with both in-person and Telemedicine consultations with no statistical difference between the two results. Mean in-person consultation scores ranged from 4.48 to 4.74 (agree) and median scores of 4 to 5 (strongly agree). Telemedicine consultation mean scores ranged from 4.38 to 4.72 and median scores between 4.5 and 5.

Medical care (Table 2)

Question 9 posed the statement ‘I felt it was important for the specialist to physically examine me’, revealed a significant difference between in-person (mean score 3.81, median score 4) and Telemedicine consultations (mean score 3.05, median score 3, *P* = 0.024). Results for questions 10–15 otherwise revealed no difference between in-person or Telemedicine consultations (mean score

range 4.47–4.68, median 4.5–5 vs. mean score range 4.4–4.76, median 4.5–5, respectively).

Privacy/Confidentiality (Table 3)

The responses revealed mean scores of 4.52–4.69 (agree) and median scores of 5 (strongly agree) for in-person consultations, whilst Telemedicine consultations revealed mean scores of 4.39–4.59 and median scores of 5 with no statistical difference between the two types of consultations.

Convenience (Table 4)

All 5 questions showed a statistically significant difference in mean and median satisfaction scores favouring Telemedicine consultations over in-person consultations. The mean time required to get to the appointment was 243 minutes (median 120 min) for in-person consultation compared to 28 minutes (median 15 min) for their Telemedicine consultation (*P* < 0.001). The mean distance travelled to get to the appointment was 482 kilometres (median 250km) for in-person

Table 4. Convenience.

Question	Consultation	Mean (SD)	Median (IQR)	Wilcoxon Rank	
				Sum test <i>P</i> -value	Paired <i>t</i> -test value
Q19 – How long did it take to get to your appointment?	In-person	243 km (392)	120 km (150)	< 0.001	0.03
	Telemed	28 km (37)	15 km (20)		
Q20 – How far did you have to travel for the consultation?	In-person	482 km (677)	250 km (342)	< 0.001	0.002
	Telemed	27 km (41)	6.5 km (26.75)		
Q21 – How much money (including fuel, parking, accommodation, loss of income from work, etc.) did it cost to attend the consultation?	In-person	AUD\$388 (591)	AUD\$200 (360)	< 0.001	0.005
	Telemed	AUD\$33 (106)	AUD\$0 (10)		
Q22 - How convenient was the consultation for you?	In-person	3.18 (1.31)	3 (2)	< 0.001	
	Telemed	4.53 (0.98)	5 (1)		
Q23 - I felt the consultation did not disrupt/interfere with my daily life	In-person	2.93 (1.27)	3 (2)	0.004	
	Telemed	4.12 (1.17)	4 (1)		

Table 5. Overall satisfaction.

Question	Consultation	Mean (SD)	Median (IQR)	Wilcoxon Rank
				Sum test <i>P</i> -value
Q24 - Overall, how satisfied were you with your consultation?	In-person	4.69 (0.60)	5 (0)	0.27
	Telemed	4.81 (0.40)	5 (0)	

consultations versus 27 kilometres (median 6.5km) for Telemedicine consultations ($P < 0.001$). The mean cost for attending an in-person consultation was AUD\$388 compared to AUD\$33 for Telemedicine consultations ($P < 0.001$). Question 22 asked 'How convenient was the consultation for you?' which returned a mean score of 4.53 and median of 5 (very convenient) for Telemedicine consultations compared to a mean score of 3.13 and median of 3 ($P < 0.001$) for in-person consultations. Question 23 stated, 'I felt the consultation did not disrupt/interfere with my daily life', with results again significantly favouring those of Telemedicine consultations with a mean of 4.12 and median of 4 (agree) compared to mean of 2.93 and median of 3 (neither agree nor disagree) for in-person consultations ($P < 0.001$).

Overall satisfaction (Table 5)

Overall satisfaction with both in-person and Telemedicine consultations was very high with no significant difference in satisfaction scores. Ninety-four percent of respondents were either satisfied or very satisfied with their overall in-person consultation, with a mean score of 4.69 and

median score of 5 (very satisfied). All respondents were either satisfied or very satisfied with their Telemedicine consultation, with means scores of 4.81 and median score of 5.

Telemedicine specific (Table 6)

During the Telemedicine consultation, 29% of respondents stated that there was no support person present, 40% had a relative or friend present, 11% had a nurse and 17% had both. Respondents were very satisfied with the quality of picture and sound used (mean score 4.47, median 5). In response to the statement 'I felt anxiety using this form of technology' posed in Question 26, results showed a mean score of 2.19 and median of 2 (disagree). Respondents strongly agreed that their medical care was not compromised using Telemedicine with a mean score of 4.48 and median of 5. When asked if Telemedicine consultations were suitable/appropriate as follow-up consultations, results revealed a high level of agreement with a mean score of 4.48 and median of 5 (strongly agree). Results for suitability/appropriateness as an initial consultation revealed a mean score of 3 and median of 4 (agree). Most respondents felt comfortable with this form of consultation in the future with results showing a mean score of 4.35 and median of 4.5 (agree). Respondents neither agreed nor disagreed when asked if they would prefer a Telemedicine consultation over an in-person consultation if offered (mean score 3.36, median 3).

Previous technology experience (Table 7)

Most patients ($n = 25$) had experienced less than five Telemedicine consultations. Over half ($n = 18$) of respondents reported never having used any video

Table 6. Telemedicine specific.

Question	Mean (SD)	Median (IQR)
Q25 - How satisfied were you with the quality of the picture and sound used?	4.47 (0.80)	5 (1)
Q26 - I felt anxiety using this form of technology	2.19 (1.18)	2 (1)
Q27 - I felt my medical care was not compromised using this form of consultation	4.48 (0.81)	5 (1)
Q28 - I felt that the consultation saved me time and/or money over an in-person consultation	4.45 (0.83)	5 (1)
Q29 - How far would you have had to travel if your consultation was done in person?	510 km (628)	275 km (356)
Q30 - Telemedicine consultations are suitable/appropriate as an initial consultation	3 (2)	4 (3)
Q31 - Telemedicine consultations are suitable/appropriate as a follow up consultation	4.48 (0.57)	5 (1)
Q32 - I feel comfortable with this form of consultation for future consultations	4.35 (0.81)	4.5 (1)
Q33 - I would prefer a telemedicine consultation over an in-person consultation if offered	3.36 (1.32)	3 (1)

	Relative or friend	GP	Nurse	Local specialist	Admin staff	Nil
Q34 - Was a support person present during your consultation?	20 (6 had both relative and nurse present)	0	10	0	1	10
		No				Yes
Q35 - Did you have to set up or control the equipment yourself?		31				4

Table 7. Previous technology experience.

Question	1	≤5	>5
Q36 - How many telemedicine consultations (including non-related to your cancer treatment) have you had?	8	17	9

	Never	Rarely	Occasionally	Often	Very often	N/A
Q37 - How often do you use other video conferencing technology/software e.g. Skype/Facettime/Webex for communication?	18	5	3	2	1	6

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	N/A
Q38 - I am a confident user of applications (e.g. Facebook and Twitter) for online communication	9	4	5	9	3	5

Clinical consultation patient satisfaction survey.

conferencing technology previously. To the statement ‘I am a confident user of applications (e.g. Facebook and Twitter) for online communication’ posed in Question 38, results were balanced with ‘Strongly disagree’ and ‘Agree’, the two most frequent responses ($n = 9$).

Discussion

This study aimed to assess satisfaction reported by patients with Telemedicine consultations compared to their experience with in-person consultations with one consultant at the Royal Adelaide Hospital Radiation Oncology Department.

Overall satisfaction levels with both in-person and Telemedicine consultations were very high. As expected,

respondents found Telemedicine consultations to be better in terms of financial burden and time. The survey revealed that Telemedicine consultations required significantly less time and money spent by patients to attend the consultation compared to an in-person consultation. Such differences can have a meaningful impact on a rural and remote cancer patient’s quality of life and social circumstances, as many are of lower socioeconomic background compared to those living in metropolitan areas.¹² Transportation to tertiary centres for appointments often is a major challenge for patients. Not only does this usually result in significant travel time but often patients are not able to travel by themselves and may require a support person or family to assist with transport and/or accommodation. Given the convenience

domain was the most obvious and expected benefit of Telemedicine consultations, the results of our study demonstrate a statistically significant and meaningful difference in support of its use.

To minimise visits, most rural and remote patients have a radiotherapy simulation (planning) scan pre-emptively booked on the same day as their initial consultation if seen in person. Although convenient for the patient, this can lead to over-allocation of resources and administrative issues as some do not require a simulation scan immediately. This can be for a number of reasons, including the need for further tests, delays due to healing time post-surgery, scheduling after systemic therapies, need for neoadjuvant treatment or simply not requiring radiation treatment at all. Having the initial consultation via Telemedicine allows the simulation scan to be scheduled at a more clinically appropriate time and has the added benefit of allowing patients who require more time to decide on whether to proceed with treatment. Furthermore, those patients who require prior preparation, such as fasting, bladder and bowel preparation or breath-hold protocol, can be adequately identified and counselled prior to their appointment.

In its current use and as described in other Telemedicine models, these consultations are mostly used in the follow-up and surveillance phase of treatment.^{13–16} Follow-up consultations appeared to be highly favourable for Telemedicine usage within our study, with all respondents either agreeing or strongly agreeing to its use. When asked about their agreement to Telemedicine consultations as suitable for an initial consultation, just over half of respondents were in favour. However, combined with the favourable results of Questions 11 and 15, which asked their satisfaction on the following statements, ‘I understood the role, rationale and logistics involved in the planning and delivery of the radiotherapy plan in my circumstance’ and ‘I felt comfortable giving consent to Radiotherapy treatment’, respectively, both of which normally apply to an initial consultation, our results suggest that Telemedicine consultations may also be appropriate for initial consultations.

The inability to perform a physical examination is often thought of as a potential weakness of Telemedicine consultations. Interestingly the results of our survey, and in particular Question 9 which posed the statement ‘I felt it was important for the specialist to physically examine me’, revealed a statistically significant difference between the two consultations. There was an overall agreement to the statement for in-person consultations whereas respondents neither agreed nor disagreed with the statement in respect to Telemedicine consultations. This significant difference likely reflects a variation in patients’ expectations between in-person and Telemedicine

consultations. This is reassuring as a lack of physical examination does not appear to adversely affect patient satisfaction from a Telemedicine consultation.

A patient’s medical care needs can differ greatly based on their diagnosis, prognosis, treatment intent and treatment options available. Furthermore, a patient’s medical care expectations, cultural and social preconceptions and understanding of their condition can impact the perceived quality of the health service and satisfaction derived from any medical consultation.^{17, 18} As such, interpreting patients’ judgement on what is adequate in terms of their own medical care, may not be overly generalisable. Despite this discernible issue, respondents were very satisfied with not only the quality of medical care received, but also satisfied that it met their expectations, whether it was conducted in-person or via Telemedicine. Importantly, respondents felt strongly that their medical care was not compromised when conducted via Telemedicine consultation.

A risk with conducting Telemedicine consultations is that patients may not feel comfortable discussing private or sensitive matters when not seeing their doctor in person. In our department and model of care, Telemedicine consultations are conducted and delivered in a dedicated clinic room with an Internet connection secured in-line with hospital encryption. It is encouraging that respondents felt highly satisfied that their privacy and confidentiality were maintained and rapport was easily established.

The technical aspects of Telemedicine consultations and a patient’s level of prior experience with such technology can often be a barrier to its usage. Respondents, however, were very satisfied with the audio and visual quality of the Telemedicine consultation. Pleasingly, most respondents did not feel anxious whilst using the technology. Furthermore, most felt comfortable with this form of consultation for future consultations. This is surprising as the majority of respondents reported having never had or rarely had any prior experience with other forms of online communication. Given the median age of our respondents of 70 years, it is pleasing that these results suggest that despite many patients’ inexperience and unfamiliarity with this form of technology, they were overall very satisfied and comfortable with Telemedicine consultations.

The high levels of patient satisfaction demonstrated in our study are comparable to results seen in other health domains^{16, 19} and supported by previous systematic reviews.^{20–22} Looking more specifically at Radiation Oncology, the Townsville model results show similarities with our data, particularly the positive benefit of Telemedicine consultations in regards to travel time and cost savings.¹¹ The results of our study reinforce that

Telemedicine consultations remain a convenient option with high levels of patient satisfaction.

The study was limited to a single institution, and to consultations with a single consultant, limiting the generalisability and strength of our overall results. It is possible that patient satisfaction with Telehealth consultations may be doctor-specific and thus inclusion of other radiation oncologists for future analysis would be beneficial. However, patient characteristics were representative of the typical patient encountered at the Royal Adelaide Hospital, with a variety of tumour types, treatment intents and geographical locations demonstrated in our study cohort.

Follow-up and initial consultations were both included in this study, however, patient results were not stratified to the type of consultation. This limits the interpretation and validity of our results as we are unable to compare responses to the same form of consultation. This may have masked a potential difference in patient satisfaction, particularly for initial consultations where one may expect an actual difference. Telemedicine consultations may be more favourably received by patients where an existing doctor–patient relationship has already been established in person. As we are not able to ascertain whether the telemedicine consult was for follow-up or initial consultation, this may have introduced further possible bias.

Although many questions are related to patients' overall quality of life, we did not formally test quality of life using some of the known metrics. It is beyond the scope of this study to test any patient disease outcomes, nor would this have been feasible given the study design. Other limitations include the low number of eligible patients and respondents, affecting the power of our study. A large number of questions asked, and the complexity of the questionnaire may have had an impact on not only the low response rate but also on how accurately the questions were answered. The time delay from eligible consult to the retrospective survey may have also contributed to the low response rate but more importantly represents a significant risk of recall bias. Questionnaires were also only posted via registered mail and not mailed electronically to complete, which not only could have improved the response rate but also provided further discussion points for analysis given the technology focus of the study.

Unfortunately, non-English speaking patients, and interpreters, were not included in this study and as such the questionnaire was only printed in English, arguably representing selection bias. Furthermore, there were no consultations where the patient was accompanied by a general practitioner or other local health specialists. Given the multicultural community seen in Australia and

particularly the large proportions of Aboriginal communities in rural and remote regions, this study may not adequately reflect the current use of Telemedicine practices' and may have limited applicability to clinical practice in Australia.

At the time of writing, the COVID-19 pandemic has significantly affected the health care system of many nations. In an effort to help reduce the risk of exposure and to protect both patients and health care providers, the Australian Government has recognised the importance of Telehealth and has quickly implemented a Medicare item number for this service. Much like our department, the vast majority of Radiation Oncology departments in Australia and New Zealand have also had to adapt to these circumstances and have widely adopted Telemedicine consultations in some form. The results of our study, although focused on rural and remote patients, certainly add supporting evidence to its broader use in Radiation Oncology as well as in other health services.

Conclusion

This study has demonstrated that there is a high level of satisfaction in the key areas of communication, medical care, privacy/confidentiality and convenience with both Telemedicine and in-person consultations. Overall satisfaction with Telemedicine consultations is high with most respondents finding that the consultations were convenient, saved travel time and money, and did not disrupt their daily lives. Importantly, patients felt their confidentiality was maintained and their medical care was not compromised.

Telemedicine consultations in Radiation Oncology should strongly be considered for all rural and remote cancer patients where feasible. We hope that the results of this study lead to improved utilisation of Telemedicine consultations in Radiation Oncology, thereby improving overall cancer care for rural and remote patients in the future.

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Conflicts of interest

No conflicts of interest to declare.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Radiation Oncology - Clinical Consultation Patient Satisfaction Survey