

**Telehealth in the context of COVID-19:
An analysis of male usage and perceptions in comparison to in-person
healthcare**

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Abstract

Background: Telehealth facilitates the provision of healthcare at a distance using technology. The emergence of COVID-19 saw rapid telehealth adoption. Although preliminary research has begun to report on this transition, few studies have analysed how men have interacted with telehealth during the pandemic. **Aim:** To study the characteristics of older men's (a) use of telehealth services, and (b) their perceptions of telehealth in comparison to in-person healthcare using Andersen's Behavioural Model of Health Services Use. **Method:** Data were sourced from the Men Androgen Inflammation Lifestyle Environment and Stress (MAILES) study, which collected data on men's demographic information, wellbeing, and healthcare utilisation during the pandemic. **Results:** Of the 731 male participants (*M age*= 69.5), 241 (33%) had used telehealth services since pandemic-related restrictions commenced in March 2020. Most men found telehealth services to be just as good (63%) as in-person services. Hierarchical logistic regressions found factors of need to be the only predictors of men's use of telehealth services, and their perceptions of telehealth compared to in-person care. Men who used telehealth services were more likely to have chronic conditions (*OR*=1.44). Men who perceived telehealth services as just as good or better than in-person care were significantly more likely to have chronic conditions (*OR*=1.63), and significantly less likely to have clinically significant symptoms of depression (*OR*=0.32). **Conclusion:** Telehealth services are popular and useful for men with chronic conditions during the pandemic but may not be preferred by men with depression. The implications of these findings and future research recommendations are discussed.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and, to the best of my knowledge, this thesis contains no materials previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.

Signed: Sam Ziesing

September 2021

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Telehealth in the context of COVID-19:

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Health help-seeking by men

Gender

In Australia, the median lifespan is six years lower for males than females (Australian Institute of Health & Welfare, 2021), and although men are diagnosed with depression at half the rate of women, they are approximately three to four times more likely to die by suicide (Oliffe & Phillips, 2008; Seidler, Rice, Dhillon, & Herrman, 2019). Gender disparities in health outcomes such as these are often discussed in the context of arguments that men underutilise health services (Addis & Mahalik, 2003). However, this idea has been contested. A narrative review of gender-comparative help-seeking studies found “occupational and socioeconomic status, among others, as more important variables than gender alone” (Galdas, Cheater, & Marshall, 2005, p. 620).

Masculinities

Rather than utilising a gender-comparative lens, recent literature has focused on investigating the needs and nuances within men’s help-seeking. In place of depictions of men as a homogenous group, studies have sought to identify multiple ‘masculinities’ within and between men which are constantly evolving based on age, health, and locale (Evans, Frank, Oliffe, & Gregory, 2011; Galdas et al., 2005; Seidler, Dawes, Rice, Oliffe, & Dhillon, 2016; Spindel & Seidler, 2020).

Barriers to men’s help-seeking

Studies which have focused on conformity to traditional masculine traits such as self-reliance and emotional control link them to avoidance of health services, delayed help-seeking, and increased distress, especially regarding mental health (Addis & Mahalik, 2003; Galdas et al., 2005; Oliffe & Phillips, 2008; Seidler et al., 2016). Generally, time constraints and poor access to healthcare are also noted as structural barriers which prevent men from seeking help (Tudiver & Talbot, 1999).

Health care services which overcome these barriers and meet the unique needs of men are crucial to improving the health outcomes of men (J. A. Smith, Braunack-Mayer, & Wittert, 2006).

Telehealth overview

Telehealth refers to the delivery of healthcare at a distance. As early as the 1920s, telehealth was used by the Royal Flying Doctor Service of Australia (2019) in the form of pedal powered radio communication which allowed people in the outback to contact doctors from the service. Since then, the arrival of the internet and smartphones have facilitated well-established telehealth programs across the globe (Gogia, 2020). Prior to the Coronavirus disease 2019 (COVID-19) pandemic, telehealth in Australia was funded through the Medicare Benefits Schedule (MBS), hospital outpatient departments, or commercially (Snoswell, Caffery, Haydon, Thomas, & Smith, 2020). Consultations commonly provided patients living in rural or remote areas with access to hospital-based specialist care (Bywood, Raven, & Butler, 2013; A. C. Smith et al., 2020). Although geographically dispersed populations and high levels of access to technology provide Australia with the perfect conditions for telehealth usage (Armfield, Edirippulige, Bradford, & Smith, 2014), it accounted for less than 0.25% of MBS activity between November 2013 to April 2014 (Wade, Soar, & Gray, 2014). Issues of funding, practitioner willingness and staff training were cited as responsible for this limited uptake (Moffatt & Eley, 2011; Wade, Elliott, & Hiller, 2014). While telehealth services did expand over time, with a notable example being during the special provision of mental health services to individuals affected by Australian bushfires in 2019-20 (MBS, 2020), it was not until the outbreak of COVID-19 that telehealth became mainstream in Australia.

Telehealth definitions

The term 'telehealth' is used to refer to many forms of healthcare that utilise technology. Up to 39 similar terms for telehealth have been identified in the literature, often using the tele-prefix to specify a subspecialty (e.g., teleradiology and telestroke) (Doraiswamy, Abraham, Mamtani, & Cheema, 2020). Such a plurality of definitions and the inconsistencies between them have been

noted as problematic by some reviewers (McLean et al., 2013). Generally, telehealth is defined in reference to a health professional at one location providing healthcare to a patient at a distanced location, without physical contact (Australian Digital Health Agency, 2021; Wosik et al., 2020). This may take the form of simultaneous interactions such as telephone or video consultations and the monitoring of patients from a distance, or non-simultaneous applications which send information electronically to be viewed at a different time and location (Flodgren, Rachas, Farmer, Inzitari, & Shepperd, 2015; McLean et al., 2013). All of these forms of telehealth operate within the sphere of 'eHealth', which is broadly defined as the use of information and communication technologies for health (WHO, 2006).

Technology requirements

The basic technology required to provide interactive telehealth consultations is a telephone. Video consultations necessitate a computer, a video/web camera, videocall software, and reliable internet (Bokolo, 2021). The patient must also have access to this technology to connect with their practitioner. Estimates of household internet access in Australians aged 16 years and older indicate that 87% are internet users, and 46% use the internet for health services. Although internet access and usage do decrease with age, 82% of Australian adults over 50 years old have access to the internet, and the majority of these use the internet for health related purposes (Zajac et al., 2012).

Telehealth for men

Barriers relating to healthcare access for men may be more adequately addressed by telehealth services compared to traditional healthcare. Restrictive opening hours, location, and time-sensitive consultation times are common obstacles to male engagement with in-person health services (Monaem, Woods, Macdonald, Hughes, & Orchard, 2007; Oliffe & Phillips, 2008). These issues, as well as waiting rooms, the need for transportation, and taking time off work are largely avoided by patients using telehealth services (Nanda & Sharma, 2021; Schulz et al., 2020; Silver, Coger, Barr, & Drill, 2020). Telephone and internet services may also provide men with a more

flexible form of help-seeking than in-person healthcare. Men report willingness to use health call centres and the internet to access health information possibly due to increased agency and privacy (Filiault & Drummond, 2009; Lopriore, 2020). It is possible that telehealth may be positioned to bridge the gap between online symptom checking and an in-person visit to a man's general practitioner.

Research into telehealth effectiveness

Despite the promise of telehealth, few robust studies have demonstrated its effectiveness in terms of patient outcomes. A systematic review of the effectiveness of video-psychotherapy ($n=33$) found statistically significant reductions in depression, but most of these studies were uncontrolled (Berryhill et al., 2019). Small, yet significant benefits in mental health symptoms were also reported in a umbrella review ($n=80$) by McLean et al. (2013). Small decreases were also seen the HbA1c of diabetics, and the blood pressure of patients with hypertension, although these were not consistent across all studies in the umbrella review. Another umbrella review ($n=53$) which reported on telehealth interventions to support self-management of chronic conditions found evidence of reduced mortality and hospital admissions for heart failure, though these findings were also inconsistent (Hanlon et al., 2017). A Cochrane review ($n=9$) also linked telehealth consultations to a reduction in the number of visits to a doctor (Bunn, Byrne, & Kendall, 2004).

A number of reviews also report high levels of patient satisfaction with telehealth. A rapid review ($n=9$) of synchronous telehealth consultations throughout Australia reported high levels of satisfaction which sometimes exceeded traditional in-person consultations (Bywood et al., 2013). Many patients cited improved outcomes, increased accessibility, convenience, and decreased costs as reasons for their satisfaction with telehealth services (Kruse et al., 2017; Powell, Henstenburg, Cooper, Hollander, & Rising, 2017). However, many telehealth studies failed to define satisfaction which rendered the results difficult to interpret (McLean et al., 2013; Verbeek, 2004).

Telehealth outcomes are most commonly analysed in comparison to those of traditional in-person consultations, often finding little to no difference between the two. Various researchers have reported comparable outcomes between telehealth services and in-person care in terms of patient satisfaction (Bunn et al., 2004), heart failure and cancer mortality rates (McLean et al., 2013), the effect of mental health therapy (Flodgren et al., 2015), as well as acceptability in older adults (Batsis et al., 2019).

Criticisms of telehealth

Despite the general acceptability of telehealth, a variety of criticisms have been raised by patients, practitioners, and researchers. Health professionals' inability to physically examine patients via telehealth may reduce the value of the consultation or result in symptoms being overlooked (Brewster, Mountain, Wessels, Kelly, & Hawley, 2014; Dorsey & Topol, 2016; Powell et al., 2017). The impairment of patient-practitioner communication and therapeutic alliances during telehealth consultations are additional worries expressed by patients (Mair, 2000) and psychologists (Knott, Habota, & Mallan, 2020). Evidence also suggests that Australian medical students do not feel well prepared to provide telehealth services due to a perceived lack of training (Edirippulige et al., 2018; Pit & Bailey, 2018). Concerns surrounding the transmission of sensitive medical data and patient privacy have also been raised (Hall & McGraw, 2014). Additionally, telehealth may suffer from the socioeconomic inequalities of traditional healthcare, exacerbated by disparities in technological access and proficiency (Dorsey & Topol, 2016). Perhaps the largest barrier to the adoption of telehealth is the apprehension of practitioners, often based on their perceptions of its impact on service, predicted poorer patient interactions, and a preference for traditional approaches (Brewster et al., 2014; Moffatt & Eley, 2011).

Paucity of quality research

Health professionals may well be apprehensive about telehealth due to the dearth of quality research in the literature. An umbrella review ($n=80$) into the effectiveness of telehealth found over

half of the reviews contained inconsistent or limited evidence (Ekeland, Bowes, & Flottorp, 2010). Reviews often highlight methodological shortcomings (Bywood et al., 2013; Mair, 2000) and publication biases in the literature (Wootton, 2012), and the need for further research before conclusions on telehealth can be made (Berryhill et al., 2019). They also note that the follow-up periods of studies are often too short, or that the studies are too underpowered to detect meaningful effects (Batsis et al., 2019; McLean et al., 2013; Wootton, 2012). Despite these findings, some commentators argue that the evidence base for telehealth is enough to justify its use in clinical settings (Sabesan & Kelly, 2015), as has occurred in Australia for decades (Bradford, Caffery, & Smith, 2016).

Telehealth in a pandemic setting

Coronavirus disease 2019

COVID-19 emerged in Wuhan, China in late 2019, spread to Australia in January, 2020 (2019-nCoV National Incident Room Surveillance Team, 2020), and was declared a pandemic on 11 March, 2020 (WHO, 2020). Despite a similar rate of infection, men are significantly more likely to die from COVID-19 than women (Green, Nitzan, Schwartz, Niv, & Peer, 2021; Rozenberg, Vandromme, & Martin, 2020; Tisminetzky et al., 2020). Individuals with chronic conditions also experience a higher fatality rate from the virus (Tisminetzky et al., 2020) and a reduced ability to manage their conditions during the pandemic (Chudasama et al., 2020; Ng & Park, 2021; Saqib et al., 2020). Globally, the pandemic has also been associated with higher rates of mental illness (Ahmed et al., 2020; Mazza et al., 2020; McCracken, Badinlou, Buhrman, & Brocki, 2020; Zhao et al., 2020). This trend is also present within Australia, where lockdowns and social distancing measures enacted to limit the spread of the virus have contributed to levels of stress, anxiety, and depression (Newby, O'Moore, Tang, Christensen, & Faasse, 2020; Upton et al., 2021; Zhou et al., 2021). The pandemic has also led to the cancellation and deferral of healthcare appointments due to fears of catching the virus, or requirements to isolate (Czeisler et al., 2020; Isautier et al., 2020). These delays in access concern patients (Atherly, Van Den Broek-Altenburg, Hart, Gleason, & Carney, 2020), as well as researchers

who worry about the potential for a wave of further health issues due to deferred healthcare (Dozois & Canada, 2021).

Use of telehealth services

Telehealth services were recognised as a “virtually perfect solution” to address the requirement for continued healthcare in the midst of a pandemic requiring physical distancing (Hollander & Carr, 2020, p. 1681). In late March 2020, the Australian Government expanded rebates for telehealth in primary care to include all Australians (Morrison, 2020), and further extended telehealth funding to specialties like psychiatry and dentistry later in the year (Jonnagaddala, Godinho, & Liaw, 2021). This led to an increase in telephone consultations from 0% to 34% of all general practitioner appointments (Snoswell, Caffery, Haydon, et al., 2020), with one in six Australians engaging in a telehealth service in June 2020 (ABS, 2020).

Telehealth modality

Although the Australian Department of Health (2021) recommends videoconferencing as the preferred way to conduct telehealth consultations, the vast majority of telehealth services in Australia have been delivered via telephone (Snoswell, Caffery, Hobson, et al., 2020). The scarcity of videoconferencing is primarily due to a lack of interest from patients and providers, particularly the elderly (Global Centre for Modern Ageing, 2020; Javanparast, Roeger, & Reed, 2021; Jonnagaddala et al., 2021). Research from overseas suggests that videoconferences are often longer, result in more diagnoses, and are preferred by clinicians in comparison to telephone calls (Phimphasone-Brady et al., 2021; Rush, Howlett, Munro, & Burton, 2018; Schifeling et al., 2020). In Australia, results linking telehealth modality and satisfaction have been mixed (Global Centre for Modern Ageing, 2020; Isautier et al., 2020).

Consumer satisfaction with telehealth services

Broadly, telehealth services during the pandemic have been found to be satisfactory by patients. Many studies cross-sectionally reported high levels of satisfaction with telehealth

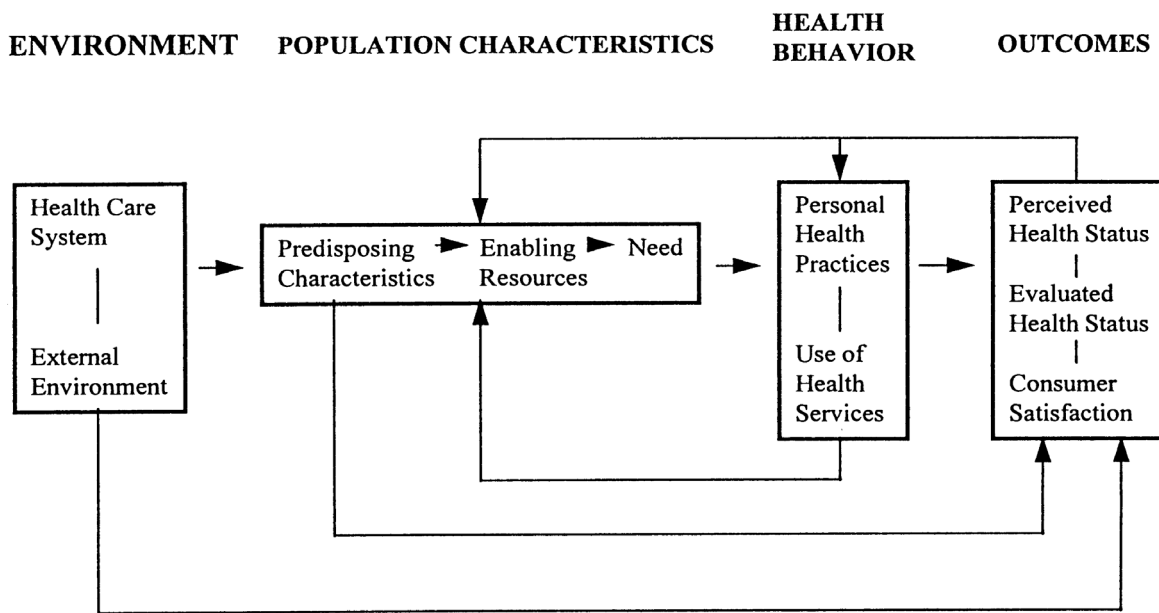
consultations (Javanparast et al., 2021; Wiadji et al., 2021), whereas others longitudinally reported increases in satisfaction after the transition from in-person care to telehealth (Ramaswamy et al., 2020). Ninety-three percent of patients from the Royal Melbourne Hospital reported that the standard of care they received in a telehealth consultation was the same as an in-person appointment (Schulz et al., 2020). Sixty-two percent of patients from an Australia-wide survey on telehealth ($n=596$) also believed their care to be just as good, or better than in-person care (Isautier et al., 2020).

Andersen Behavioural Model of Health Services Use

While these results are promising, the unique challenges associated with engaging some men in traditional healthcare may be exacerbated by the pandemic, and the rapid response of the healthcare system. The Andersen (1995) Behavioural Model of Health Services Use has been applied extensively to understand the utilisation of health services generally (Babitsch, Gohl, & Von Lengerke, 2012), specifically for telehealth (Guzman-Clark et al., 2020; Looman et al., 2015), and in the context of the COVID-19 pandemic (Kim, You, & Shon, 2021). The Andersen (1968) model was first applied to explain families' use of medical services and has since undergone multiple revisions (Andersen, 1995; Andersen, Davidson, & Baumeister, 2014), though the 1995 model is the most frequently used (Babitsch et al., 2012). As seen in Figure 1, the model suggests that the use of healthcare services occurs when subjects are predisposed to receive care, they can harness the enabling resources to access the care, and when they perceive a need to utilise healthcare services. Andersen's model will be used to investigate the utilisation of telehealth telephone or video consultations in Australian men the context of a global pandemic. The following subsections will describe predisposing characteristics, enabling resources, and need within the model, and report existing research on the variables included in our study. Although this study focuses on men, mixed-gender research also will be discussed due to a lack of male-specific research on telehealth use during the pandemic.

Predisposing characteristics. Predisposing characteristics refer to conditions that predispose an individual to utilise healthcare services without directly instigating use (Andersen et al., 2014). They can include demographic variables such as age and gender, as well as social factors such as education and marital status (Andersen, 1995).

Figure 1: Andersen’s Behavioural Model of Healthcare Utilisation (Andersen, 1995)



Gender. Emerging data suggest that women were almost twice as likely to use telehealth services as men in Australia during the pandemic (ABS, 2020). Similar gender gaps in usage have been reported overseas (Atherly et al., 2020; Koonin et al., 2020; Lott, Campbell, Hutzler, & Lajam, 2021). Some studies have also reported that men tend to be less satisfied with their telehealth experience compared to women (Arumugam, Ramadoss, Brindhadevi, Easwaran, & Kumari, 2021; Isautier et al., 2020).

Age. Globally, patients who utilised telehealth services during the pandemic were often younger than those who attended in-person care (Boehm et al., 2020; Franciosi et al., 2021; Koonin et al., 2020; Reed et al., 2020), though many researchers emphasised how small these differences were considering the traditional attitudes of elderly people towards technology (Atherly et al., 2020; Vosburg & Robinson, 2021). Consumer satisfaction with telehealth does not seem to differ

significantly based on age (Isautier et al., 2020; Vosburg & Robinson, 2021). It is possible that within the context of a pandemic, older people will adopt telehealth if no alternatives are available.

Education. Data suggests that telehealth users tend to have higher levels of education than those who do not use telehealth (Atherly et al., 2020; Isautier et al., 2020), though results on the relationship between education and telehealth satisfaction are less clear. While one study ($n=128$) reported that patients with lower educational qualifications were less satisfied with telehealth during the pandemic (Adams et al., 2021), another study ($n=596$) found no relationship (Isautier et al., 2020).

Marital status. Besides a study ($n=4525$) which linked partnered participants to an increased readiness to engage in telehealth videocalls (Lam, Lu, Shi, & Covinsky, 2020), data on the association between marital status and telehealth in a pandemic setting is lacking. Pre-pandemic research on the topic suggests men tend to view their partners as a primary resource for help (J. A. Smith et al., 2006), and that partnered men are more likely to visit a doctor than non-partnered men (Holden et al., 2006; Schlichthorst, Sanci, Pirkis, Spittal, & Hocking, 2016).

Enabling resources. Enabling resources refer to conditions that facilitate or impede an individual's use of healthcare (Andersen, 1995), such as income and health insurance.

Masculine traits. No study appears to have analysed the influence of masculine traits on men's telehealth utilisation during the pandemic. Studies conducted prior to the pandemic reported associations between hegemonic masculine traits and healthcare avoidance and reluctant help-seeking (Galdas et al., 2005; Oliffe & Phillips, 2008). Emerging research on multiple masculinities suggests that strengths-based approaches can leverage masculine traits to facilitate healthcare utilisation. For example, older men's preference for independence could be harnessed to increase their engagement with the healthcare system rather than limit it (J. A. Smith, Braunack-Mayer, Wittert, & Warin, 2007).

Financial status. While there appears to be a paucity of data on telehealth usage delineated by income in Australia, findings from the United States suggest that people from lower socioeconomic areas were less likely to have access to telehealth services (Lott et al., 2021; Ng & Park, 2021), and were less likely to use it if they did have access (Reed et al., 2020).

Need variables. Need refers to both the patient and healthcare professional's perception of the requirement for medical treatment, and is postulated to explain much of the variance in healthcare utilisation (Andersen, 1995).

Chronic conditions. As previously mentioned, people with chronic illnesses are particularly vulnerable to COVID-19 and often require regular care for their conditions. Presumably for these reasons, people with long-term conditions have been shown to be more likely to use telehealth services than those without conditions during the pandemic (ABS, 2020; Atherly et al., 2020).

Mental health symptoms. The pandemic presents a unique problem for mental healthcare, which must manage increased rates anxiety and depression symptoms, as well as reductions in the availability of social support and face-to-face therapy (Ali, Khoja, & Kazim, 2021; Zhou et al., 2021). Overseas, individuals with mental health conditions generally exhibited a high willingness to transition to telehealth during the pandemic (Atherly et al., 2020; Miu, Vo, Palka, Glowacki, & Robinson, 2020). Despite this, research within Australia has found that a history of comorbid depression and anxiety was associated with a poorer telehealth experience (Isautier et al., 2020).

Gaps in the literature

For decades, telehealth in Australia has been a largely rural and rare phenomenon. The outbreak of the pandemic necessitated the transition from traditional in-person healthcare to telehealth, exposing many health practitioners and patients to distanced care for the first time. The ramifications of such a rapid shift have garnered much academic attention, but this research lacks a focus on men and their unique characteristics. Studies of telehealth during the pandemic have rarely

applied a theoretical framework such as the Andersen model to their analysis of service engagement.

Current study

While the healthcare system may not always meet the needs of men in usual circumstances, the suitability of telehealth in the context of a pandemic adds an additional layer of uncertainty. This study uses the Andersen model to contribute to emerging literature on the impact of COVID-19 on healthcare in Australia, with attention paid to men's utilisation of telehealth services and their perceptions of telehealth in comparison to traditional in-person care.

Study aims

This study has three aims:

1. Examine the demographic and health characteristics of men who did and did not access telehealth during the COVID-19 pandemic.
2. Use the Andersen model to investigate the characteristics which may predispose men to utilise telehealth (e.g., age, education), the resources that may enable them to do so (e.g., income, masculine traits), and the need conditions (e.g., chronic conditions, depression) under which they recognise they require telehealth care.
3. Develop an understanding of how men perceive their experience of telehealth consultations in comparison with traditional in-person care.

Chapter 2: Methods

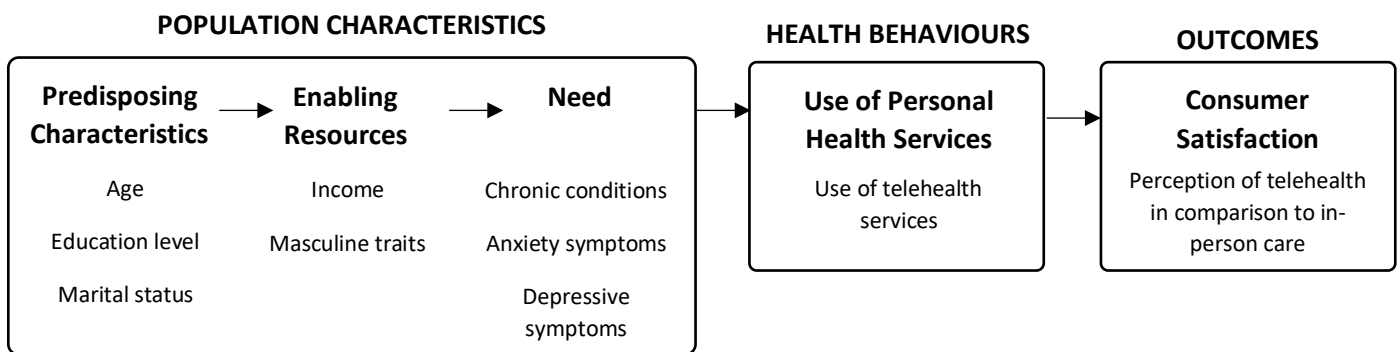
Study Design

Data for the present study were drawn from the Men Androgen Inflammation Lifestyle Environment and Stress (MAILES) study. MAILES combines data from participants of the Florey Adelaide Male Ageing Study (FAMAS) and eligible male participants from the North West Adelaide Health Study (NWAHS). MAILES is a longitudinal study of men's health and wellbeing, collecting data on demographics, biometrics, quality of life, health conditions, health service usage, and psychosocial issues. Specific variables have varied slightly by wave and between FAMAS and NWAHS collections. The first MAILES wave was between 2002-06, with data collection approximately every five years since in the form of questionnaires and/or clinical data collection. Additional details regarding cohort harmonisation are reported in Grant et al. (2014).

This study used data from the most recent wave in 2020, which focused mainly on men's experiences during the COVID-19 restrictions. Further data specifically on masculine traits were sourced from the 2016 FAMAS wave as this was not collected by either NWAHS or FAMAS in 2020.

Theoretical framework

The present study used Andersen's Behavioural Model (1995) as a tool to understand factors associated with healthcare utilisation and patient perceptions of telehealth in this cohort. In this model, population characteristics (which include predisposing characteristics, enabling resources, and need factors) are the predictor variables. These lead to the outcomes: whether or not men used any telehealth service, (a 'health behaviour' in the model) and men's perceived quality of telehealth in comparison to in-person care (an 'outcome' in the model). The variables investigated at each level in this study, and their positions in the Andersen model, are shown in Figure 2. Although each population characteristic can be said to contribute independently to the outcome variables, the model uses arrows to suggest a causal ordering from one variable to another (Andersen, 1995). For

Figure 2: Andersen's Behavioural Model with labelled study variables

example, an individual's predisposing characteristics (e.g., their age) may impact their enabling resources (e.g., their income), which in turn contributes to their need for healthcare (e.g., presence of chronic conditions).

Participants

The MAILES study cohort consists of a randomly sampled population of metropolitan community-dwelling men from Northern and Western suburbs of Adelaide who were originally recruited in 2002 in FAMAS, and 2004 in NWAHS. Households were contacted via telephone using numbers listed in the Electronic White Pages. Participants were selected from the household and asked to attend the research clinic for a medical examination if they were male, aged 35-80 years, were the last male in the household who fit these criteria to have had a birthday, and were willing to consent to participate. Participants were excluded if they were not able to understand the study requirements or attend clinics, were non-English speaking, resided outside the catchment area, or were housed in an institutional setting. Of the 2563 participants who were included in the study at baseline, 746 remained at wave 4 (2020), and 731 completed responses to telehealth questions. The original MAILES sample was deemed to be representative of middle aged to elderly Caucasian men in the northern and western regions of Adelaide, and generalisable to the broader population (Grant et al., 2014). At baseline, the majority of the men were aged 45 to 64 years of age (50.6%), born in

Australia (65.5%), educated at a trade/diploma level (51.9%), married (73.5%), and employed full-time or retired (79.4%) (Grant et al., 2014).

Procedures

In 2020, remaining participants of the MAILES cohort were invited to participate in a follow-up questionnaire. Participants with a recorded email address were sent a link to complete the survey online, and those without were mailed a physical questionnaire with a reply-paid envelope and a letter with information about the study. There was an approximate 50/50 split between online and mail questionnaire completion. The questionnaire was estimated to take 25 minutes to complete. No reimbursement was provided to participants. Data collection began on the 6 October 2020 and concluded on 31 March 2021. Written informed consent was provided by all participants. The contact information of mental health support services was included in the questionnaire in case any questions were distressing to participants.

Measures

Demographic information

Participant date of birth was recorded at baseline and carried forward to the 2020 dataset. Data on highest level of education, household income, and marital status were collected in the 2020 MAILES survey.

Healthcare and telehealth variables

Data were collected on whether or not (yes/no) the participant had missed or delayed 13 different types of healthcare (e.g., general practitioner visit, psychological care) due to the COVID-19 pandemic (“As a result of COVID-19, have you missed or delayed any of the following health care services?”). If they answered yes to having deferred or delayed any type of healthcare, the participant was also asked whether they believed their health had declined because of this deferral or delay (yes/no).

Data were also gathered on a four-point Likert scale of how likely (“Definitely will not” to “Definitely will”) participants were to recommend telehealth to others (“How likely would you be to recommend telehealth services to someone else?”).

Participants were also asked on a five-point Likert scale if they believed it was useful (“Not at all” to “Extremely”) to have telehealth after the pandemic ends (“How useful do you think it will be to have medical appointments via telehealth after the COVID-19 emergency is over?”).

Masculine traits

The Masculinity in Chronic Disease Inventory (MCD-I) is a measure of perceived masculine ideologies. It was originally validated in the context of prostate cancer but expanded to include other chronic diseases (Chambers et al., 2016; Goodwin et al., 2020; Occhipinti et al., 2019). The inventory contains 22 items on five subscales: Strength/Fitness (e.g., “Being physically strong is important to me”), Sexual Priority/Importance (e.g., “Being physically able to have sex is important to me”), Family Responsibilities (e.g., “I like to know I am looking after my partner or family”), Emotional Self-Reliance (e.g., “I keep my feelings to myself”), and Optimistic Action (e.g., “I always look for the good in situations”). Participants rated the extent to which each statement was true for them on a five-point Likert scale (“Not at all true” to “Very true”). The method of data presentation precluded calculations of internal consistency for this study sample, but previous analyses found the MCD-I total score to have good reliability ($\alpha = 0.88$), with the subscales having good to excellent reliabilities ($\alpha = 0.68 - 0.93$) (Chambers et al., 2016; Occhipinti et al., 2019).

Anxiety

Symptoms of anxiety were assessed over the past two weeks using the General Anxiety Disorder-7 (GAD-7). In the GAD-7, participants rate the frequency which they have been bothered by seven different states (e.g., “Feeling nervous, anxious or on edge” and “Becoming easily annoyed or irritable”). Answer options range from zero (“Not at all”) to four (“Nearly every day”). The GAD-7 is considered a valid and efficient tool for screening for general anxiety symptoms and their severity in

research settings (Spitzer, Kroenke, Williams, & Löwe, 2006). A score of ≥ 10 is considered a reasonable cut-off point for identifying anxiety (Spitzer et al., 2006). Internal consistency in the current sample was excellent ($\alpha = 0.93$).

Depression

Depressive symptoms were assessed using the Beck Depression Inventory (BDI) in FAMAS participants and the Centre for Epidemiological Studies Depression Scale (CES-D) in NWAHS participants. Both measures are regarded as robust and well-established (Shafer, 2006). The BDI consists of 21 statements which may describe how the participant has been feeling in the past week. Each statement has four possible responses which range in intensity from zero (e.g., "I do not feel like a failure") to three (e.g., "I feel I am a complete failure as a person"). Higher scores indicate higher levels of depression. A cut-off score of ≥ 10 is recommended for detecting mild to moderate depression in the BDI (Beck, Steer, & Carbin, 1988). The CES-D consists of 20 statements which also describe how the participant felt over the past week (e.g., "I was bothered by things that usually don't bother me"). CES-D response options also range from zero (e.g., "Rarely or none of the time") to three (e.g., "Most or all of the time"). A cut-off score of ≥ 16 suggests depression in the CES-D (Lewinsohn, Seeley, Roberts, & Allen, 1997). Clinical cut-offs of ≥ 10 in the BDI and ≥ 16 in the CES-D were used in the data analysis rather than raw scores so the results for participants in both studies could be combined. Based on the current sample, the internal consistencies of the BDI and CES-D were excellent ($\alpha = 0.94$) and good ($\alpha = 0.85$), respectively.

Chronic conditions

Chronic conditions diagnosed by a doctor were self-reported by participants from a list of 22 options (e.g., stroke, diabetes) following the question "Have you ever been told by a doctor that you have any of the following conditions?" Each was answered as yes or no. Data analysis was conducted using the total number of chronic conditions suffered by participants.

Telehealth usage

Telehealth usage since COVID-19 restrictions commenced in March 2020 was self-reported (yes/no) by participants in response to the question “Have you used telehealth services?” The questionnaire explicitly defined telehealth for participants as “an appointment with a health care provider by video or phone instead of an in-person visit.”

Perception of telehealth in comparison to in-person care

Participants who had used any telehealth services were then asked their overall perception of the telehealth consultation(s) in comparison to their past experiences with in-person consultations (“How did the telehealth services compare to a traditional in-person medical visit?”). Possible responses were ‘Worse’, ‘Just as good’, ‘Better’, or ‘Don’t know’. Participants who responded ‘Don’t know’ were excluded from the analyses.

Statistical analysis

Data were analysed using R (Version 4.0.2). As data missing at a rate of 5% or less are considered inconsequential (Dong & Peng, 2013), missing telehealth use data (2%) underwent case-wise deletion. There were no missing data (0%) on participant comparisons of telehealth to in-person healthcare. Missing predictor data were imputed using Multivariate Imputations by Chained Equations (Van Buuren & Groothuis-Oudshoorn, 2011). This method offers a “principled yet flexible” approach to imputation in which each variable with missing data is modelled using a regression based on other variables in the data according to its distribution (Azur, Stuart, Frangakis, & Leaf, 2011, p. 48). Five imputations were conducted for each variable. All predictor data, except for masculine traits, were imputed using MICE to address missing data such as income (18.5%) and anxiety symptoms (10.2%). As the MCD-I was most recently administered in the 2016 FAMAS wave, a large proportion of men (63%) in the 2020 MAILES wave did not have data on masculine traits. These high rates of missing data made imputation of the data infeasible and limited the use of MCD-I data to independent samples *t*-tests.

First, descriptive statistics of continuous (means, standard deviations) and categorical (frequencies, percentages) participant characteristics were calculated using the imputed data to gain a basic understanding of the sample.

Next, independent samples *t*-tests and chi-square tests were performed to explore associations between regression predictor variables (age, education level, marital status, income, masculine traits, presence of chronic conditions, and symptoms of anxiety and depression) and participant telehealth usage.

Finally, two regressions were carried out to examine the effectiveness of the Andersen model for predicting (a) men's telehealth use and (b) perception of telehealth versus in-person care. Before the regressions, data were checked for potential multicollinearity ($r \geq 0.80$) using correlation matrices, and deviations from normality and outliers were assessed by checking Q-Q plots. All assumptions were met.

After checking the assumptions, hierarchical binary logistic regression was first used to assess the effectiveness of the models in predicting participant telehealth usage. Predictors were entered in three blocks as per the Andersen model: predisposing characteristics (block Use Model 1 in the presented results), enabling resources (Use Model 2), then need factors (Use Model 3).

Next, hierarchical ordinal regression assessed the model's effectiveness in predicting men's perception of telehealth versus in-person care, with predictors added in the same three blocks: predisposing characteristics (Comparison Model 1), enabling resources (Comparison Model 2), then need factors (Comparison Model 3). The model with the lowest Akaike information criterion (AIC) and highest Nagelkerke's pseudo R^2 was interpreted as the best fit for the data (Nagelkerke, 1991; Vrieze, 2012). AIC is a widely used model-selection criterion in which models with the lowest scores indicate a compromise between conformity to the data and parsimony (Cavanaugh & Neath, 2019).

All findings were considered statistically significant at $\alpha < 0.05$, or when the 95% confidence intervals of odds ratios did not cross zero.

Ethics

The MAILES study was granted ethics approval from the Human Research Ethics Committees (HRECs) of the Queen Elizabeth HREC for the NWAHS (approval number: 2010054) and the Royal Adelaide Hospital HREC for the FAMAS (approval number: 020305).

Chapter 3: Results

Participant demographics

Descriptive statistics of the 731 participants are presented in Table 1. Participants ranged from 50 to 94 years of age ($M=69.5$ years, $SD=9.6$). The most common highest level of education was a trade certificate, TAFE, or an apprenticeship (43%), followed by primary school (27%), and a Bachelor's degree or higher (19%). Three quarters of men were married or in a de facto relationship (76%). The greatest proportion of the men had an income of \$20,001 to \$40,000 (25%) or \$40,001 to \$60,000 (23%).

Most participants reported having at least one diagnosed chronic condition (88%). The majority (71%) had two or more comorbid chronic conditions. The most common chronic conditions were high blood pressure (49%), high cholesterol (41%), and diabetes (19%).

Using clinical cut-offs, 30% of participants had current anxiety, and 16% had current depression.

Comparison of telehealth users and non-users

Descriptive statistics of telehealth users and non-telehealth users in the sample are also shown in Table 1. Around one third ($n=241$; 33%) of men had used telehealth services since restrictions commenced in March 2020. The results of independent sample t -tests and chi-square tests comparing variables of telehealth users to non-users can also be seen in Table 1 and described below.

Predisposing characteristics

Although telehealth users were younger than non-users, there was no significant difference between the mean age of users and non-users. Similarly, no significant relationship was found between telehealth usage, and the highest level of education achieved by participants or their marital status.

Participant variables	Accessed telehealth (n=241)		Did not access telehealth (n= 490)		Total (n= 731)		t/ X ²	p	Cohen's d/ Cramer's V
	M/n	SD/%	M/n	SD/%	M/n	SD/%			
Table 1. Characteristics of participants by telehealth usage and independent samples t-tests/chi-square test results									
Age in years	68.64	8.7	69.91	9.96	69.47	9.57	1.762	.079	.132
50-59 years	41	17.0	84	17.1	125	17.1			
60-69 years	85	35.3	159	32.4	244	33.4			
70-79 years	87	36.1	161	32.9	248	33.9			
80-89 years	28	11.6	86	17.6	114	15.6			
Highest educational level							7.466	.058	.101
Primary school	59	24.5	136	27.8	195	26.7			
High school	31	12.9	56	11.4	87	11.9			
TAFE/Apprenticeship/trade	94	39.0	220	44.9	314	43.0			
Bachelor's degree or higher	57	23.7	78	15.9	135	18.5			
Marital status							.091	.763	.011
Partnered	182	75.5	375	76.5	557	76.2			
Not partnered	59	24.5	115	23.5	174	23.8			
MCD-I total score (n=289)	80.80	11.80	81.84	13.92	81.36	13.19	.632	.528	.079
Income							-1.313	.190	.103
≤\$12,000	3	1.2	10	2.0	13	1.8			
\$12,001 - \$20,000	17	7.1	34	6.9	51	7.0			
\$20,001 - \$40,000	56	23.2	127	25.9	183	25.0			
\$40,001 - \$60,000	51	21.2	118	24.1	169	23.1			
\$60,001 - \$80,000	37	15.4	56	11.4	93	12.7			
\$80,001 - \$100,000	23	9.5	50	10.2	73	10.0			
\$100,001 - \$150,000	34	14.1	63	12.9	97	13.3			
\$150,001 - \$200,000	13	5.4	22	4.5	35	4.8			
≥\$200,001	7	2.9	10	2.0	17	2.3			
No. of chronic conditions	3.12	2.13	2.58	1.91	2.79	2.05	-3.459	.001	.264
0	22	9.1	64	13.1	86	11.8			
1	39	16.2	87	17.8	126	17.2			
≥2	180	74.7	339	69.2	519	71.0			
Anxiety	9.98	4.67	9.09	3.73	9.36	4.06	-2.594	.010	.220
GAD-7 score < 10	152	63.1	360	73.5	512	70.0			
GAD-7 score ≥ 10	89	36.9	130	26.5	219	30.0			
Depression							3.212	.073	.066
Not clinically significant	193	80.1	418	85.3	611	83.6			
Clinically significant	48	19.9	72	14.7	120	16.4			

Enabling resources

While telehealth users had higher average masculinity scores and higher incomes than non-users, neither of these associations were statistically significant.

Need for telehealth

Telehealth users reported significantly more chronic conditions and more symptoms of anxiety than non-users. No statistically significant association was found between depression and telehealth use or non-use.

Characteristics of participant telehealth use

The characteristics of telehealth use in participants who accessed telehealth services are presented in Table 2. The most common device used for telehealth appointments was telephone (96%). Sixty-seven percent of participants said they either ‘probably’ or ‘definitely’ would recommend telehealth, while 29% said they ‘probably’ or ‘definitely’ would not. Sixty-one percent of

Table 2: Characteristics of telehealth use (n=241)

Variable	<i>n</i>	%
Telehealth modality		
Telephone	231	95.9
Video	3	1.2
Both	7	2.9
Telehealth in comparison to in-person care		
Better	10	4.1
Just as good	152	63.1
Worse	62	25.7
Don’t know	17	7.1
Likelihood to recommend telehealth		
Definitely will not	13	5.4
Probably will not	56	23.2
Probably will	116	48.1
Definitely will	45	18.7
Don’t know	11	4.6
Usefulness of telehealth after pandemic		
Not at all	38	15.8
Slightly	56	23.2
Moderately	88	36.5
Very	44	18.3
Extremely	15	6.2

participants thought telehealth would be at least 'moderately' useful after the pandemic. However, 16% believed it would be 'not at all' useful.

Predictors associated with use of telehealth services

A hierarchical binary logistic regression was conducted to investigate the relationship of predisposing characteristics, enabling resources, and need factors with telehealth use (Table 3). Use Model 3, which included predisposing characteristics (age, educational level, marital status), enabling resources (income), and need factors (chronic conditions, symptoms of anxiety and depression), provided the best fit for the data based on the AIC and Nagelkerke's pseudo R^2 .

The only significant predictor within the telehealth use model was number of chronic conditions $b = 0.36$, $p < .001$, $OR = 1.44$ (95% CI: 1.21, 1.71). This suggests that for every additional

Table 3: Hierarchical binary logistic regression predicting participants' usage of telehealth (n=731)

Predictor	Use Model 1		Use Model 2		Use Model 3	
	<i>b</i> (SE)	OR (95% CI)	<i>b</i> (SE)	OR (95% CI)	<i>b</i> (SE)	OR (95% CI)
Predisposing characteristics						
Age	-0.11 (0.08)	0.89 (0.76, 1.05)	-0.10 (0.09)	0.90 (0.76, 1.08)	-0.17 (0.10)	0.84 (0.69, 1.01)
Educational level	0.09 (0.08)	1.10 (0.94, 1.27)	0.08 (0.08)	1.09 (0.93, 1.27)	0.09 (0.08)	1.10 (0.94, 1.29)
Marital status	-0.07 (0.18)	0.94 (0.65, 1.35)	-0.08 (0.19)	0.92 (0.64, 1.35)	-0.07 (0.20)	0.94 (0.64, 1.39)
Enabling resources						
Income			0.00 (0.00)	1.00 (1.00, 1.00)	0.00 (0.00)	1.00 (1.00, 1.01)
Need factors						
Chronic conditions					0.36 (0.09)	1.44** (1.21, 1.71)
Anxiety					0.20 (0.10)	1.22 (1.00, 1.48)
Depression					-0.08 (0.28)	0.92 (0.52, 1.60)
Model summary						
	$R^2 = 0.01$ R^2 change = 0.01 AIC = 930.46		$R^2 = 0.01$ R^2 change = 0.00 AIC = 932.37		$R^2 = 0.05$ R^2 change = 0.04 AIC = 914.14	

95% CI 95% confidence interval, AIC Akaike information criteria, R^2 Nagelkerke's Pseudo R^2 $p < .05$. ** $p < .01$.

chronic condition comorbidity, men were approximately 44% more likely to use telehealth services, holding all other variables constant.

Predictors associated with telehealth satisfaction in comparison to in-person healthcare

A hierarchical ordinal logistic regression was also conducted to investigate the relationship of predisposing characteristics, enabling resources, and need factors to men's perception of telehealth compared to traditional in-person healthcare ('worse,' 'just as good,' or 'better'). The results of the hierarchical ordinal regression can be seen in Table 4. Comparison Model 3, which included predisposing characteristics (age, educational level, marital status), enabling resources (income), and need factors (chronic conditions, symptoms of anxiety and depression), provided the best fit for the data based on the AIC and Nagelkerke's pseudo R^2 .

Total number of chronic conditions, $b = 0.49$, $p < .005$, $OR = 1.63$ (95% CI: 1.17, 2.29) and clinically significant depression scores, $b = 1.13$, $p = .027$, $OR = 0.32$ (95% CI: 0.12, 0.88) each significantly predicted men's perception of telehealth compared to in-person care. The results suggest that for every additional comorbid chronic condition, men are 63% more likely to favourably compare telehealth services to in-person healthcare (i.e., 'just as good' or 'better' compared to 'worse'), while men with depression are approximately 68% more likely to unfavourably compare telehealth services to in-person care, holding all other variables constant.

Table 4: Hierarchical ordinal logistic regression predicting participants' assessment of telehealth compared to in-person healthcare (n=224)

Predictor	Comparison Model 1		Comparison Model 2		Comparison Model 3	
	<i>B</i> (<i>SE</i>)	<i>OR</i> (95% <i>CI</i>)	<i>B</i> (<i>SE</i>)	<i>OR</i> (95% <i>CI</i>)	<i>B</i> (<i>SE</i>)	<i>OR</i> (95% <i>CI</i>)
Predisposing characteristics						
Age	-0.11 (0.16)	0.90 (0.65, 1.23)	-0.10 (0.09)	0.91 (0.63, 1.30)	-0.18 (0.19)	0.84 (0.57, 1.22)
Educational level	-0.23 (0.13)	0.79 (0.60, 1.03)	-0.24 (0.08)	0.79 (0.59, 1.04)	-0.26 (0.15)	0.77 (0.58, 1.02)
Marital status	0.07 (0.33)	1.07 (0.55, 2.05)	0.06 (0.19)	1.06 (0.53, 2.07)	-0.01 (0.35)	0.99 (0.49, 1.97)
Enabling resources						
Income			0.00 (0.00)	1.00 (0.99, 1.01)	0.00 (0.00)	1.00 (0.99, 1.01)
Need factors						
Chronic conditions					0.49 (0.17)	1.63** (1.17, 2.29)
Anxiety					0.23 (0.18)	1.26 (0.89, 1.82)
Depression					-1.13 (0.51)	0.32* (0.12, 0.88)
Model summary						
	$R^2 = 0.02$ R^2 change = 0.02 AIC = 346.00		$R^2 = 0.02$ R^2 change = 0.00 AIC = 347.98		$R^2 = 0.08$ R^2 change = 0.06 AIC = 342.46	

95% *CI* 95% confidence interval, *AIC* Akaike information criteria, R^2 Nagelkerke's Pseudo R^2 * $p < .05$. ** $p < .01$.

Chapter 4: Discussion

Overview

This study used the Andersen Behavioural Model (1995) to examine the characteristics of telehealth service usage in a sample of middle aged to elderly Australian men during the COVID-19 pandemic. One third of men had used telehealth services since restrictions commenced in March 2020. Results suggest that men's telehealth usage and the comparisons they made with in-person care were dependent on factors of need. Men with symptoms of anxiety and chronic conditions were more likely to use telehealth services. The majority of men (63%) who used telehealth services found their consultation to be just as good as traditional in-person services. Men with chronic conditions were more likely to perceive telehealth positively in comparison to in-person services, while men with depression were more likely to perceive their experience negatively.

Findings

Telehealth service use

The proportion of men (33%) who utilised telehealth services in this sample was similar to other emerging literature on telehealth usage during the pandemic. Within Australia, a cross-sectional survey found that 25% of men engaged with telehealth services between the start of the pandemic and June 2020 (Isautier et al., 2020), while a non-gendered survey reported that 20% of people used telehealth services in June 2020 (ABS, 2020). These studies may have had lower rates of telehealth use due to shorter study periods of three months or less compared to the year-long period of interest in this study. However, data from the United States reported rates of telehealth usage as high as 45% (Atherly et al., 2020). Although these results indicate that telehealth is more popular in the United States than Australia, they may also reflect the inclusion of women in the study and the severity of the pandemic in the United States (WHO, 2021).

Telehealth modality

The vast majority of telehealth consultations in this sample were conducted via telephone (96%). While these results reflect an Australia-wide trend which consistently finds over 90% of MBS services provided via telephone since April 2020 (Snoswell, Caffery, Hobson, et al., 2020), the popularity of telephone consultations seen in this sample may also be related to older people's preference for telephone over videoconferencing (Global Centre for Modern Ageing, 2020; Schifeling et al., 2020). Interestingly, the Australian Department of Health (2021) recommends videoconferencing if the facilities are available, though uptake of this modality has been limited by a lack of technical infrastructure as well as poor interest and acceptance from patients and healthcare practitioners (Javanparast et al., 2021; Jonnagaddala et al., 2021).

Evidence from North America suggests that while telephone consultations were more common in Canada (Mohammed et al., 2021), almost half of all telehealth consultations in two clinics in the United States were delivered via videoconferencing (Schifeling et al., 2020). In some hospitals in the United States, videoconferencing was the main method of service delivery (Sachs, Graven, Gold, & Kassakian, 2021). Worryingly, underutilisation of videoconferencing in Australia may translate into poorer healthcare outcomes. Compared to telephone consultations, videoconferences result in more diagnoses (Schifeling et al., 2020), fewer medical errors, greater decision-making accuracy (Rush et al., 2018), and higher levels of patient and healthcare practitioner satisfaction (Global Centre for Modern Ageing, 2020; Phimphasone-Brady et al., 2021). Although it is too soon to link telehealth modality to patient endpoints, further studies in this area can help guide health policy in the future.

Characteristics of telehealth users and their comparison of telehealth to in-person care

Chronic conditions. As expected, men with chronic conditions were more likely to utilise telehealth services. Similar trends have been reported locally (ABS, 2020; Isautier et al., 2020) and internationally (Atherly et al., 2020). The pandemic has posed unique risks to men suffering from

chronic conditions, as they are at an increased risk of hospitalisation from COVID-19 (Tisminetzky et al., 2020). Men's ability to manage their chronic conditions has also been hindered by pandemic restrictions (Imeri, Holmes, Desselle, Rosenthal, & Barnard, 2021; Saqib et al., 2020). In many cases, telehealth can facilitate the continuation of care without deferring healthcare, or risking infection. In part, this may have contributed to this sample of men perceiving telehealth 68% more favourably compared to in-person care for each chronic condition they had.

Although robust studies in this area are lacking, two umbrella reviews of telehealth use for chronic disease management prior to the pandemic found that most systematic reviews reported telehealth to be a safe form of healthcare which improves patient outcomes (Hanlon et al., 2017; Wootton, 2012). Although small scale studies on the management of chronic conditions during the pandemic are only just emerging, initial results reveal that patients with chronic conditions are satisfied with telehealth due to its ease of use and accessibility (Javanparast et al., 2021). Particularly for general practitioner consultations, patients valued telehealth for activities such as prescription renewal, chronic condition check-ups, and discussions between patients and their general practitioner (Javanparast et al., 2021).

Though telehealth may be sufficient for men with chronic conditions in many cases, consultations requiring a physical examination have been identified as a limitation of telehealth during the pandemic (Nanda & Sharma, 2021). Although one study found that the majority of surgical patients felt their telehealth consultation was no less thorough without a physical examination (Wiadji et al., 2021), other studies reported that patients and healthcare practitioners frequently linked the inability to be physically examined via telehealth with limited diagnostic ability (Arumugam et al., 2021; Grossman, Chodick, Reingold, Chapnick, & Ashkenazi, 2020; Isautier et al., 2020; A. C. Smith et al., 2020).

Mental health symptoms. In this sample, men with symptoms of anxiety were more likely to utilise telehealth services. This trend aligned with pre-pandemic studies which reported that patients

with anxiety used healthcare services at twice the rate than those with no anxiety (Kujanpää, Jokelainen, Auvinen, & Timonen, 2016; Wittchen et al., 2012). During the pandemic, demands for mental healthcare services may have increased due to elevated rates of mental ill-health symptoms globally (Xiong et al., 2020), and within Australia due to the pandemic (Newby et al., 2020; Zhou et al., 2021). Raised rates of health anxiety related to the pandemic may have also led to heightened demands for services (Kibbey, Fedorenko, & Farris, 2021; Sunderland, Newby, & Andrews, 2013). Studies have shown that although mental health patients commonly delayed care due to pandemic restrictions, they had a high willingness to resolve the delay through telehealth services (Atherly et al., 2020). These reasons partially account for the higher rates of telehealth services use by men with greater anxiety symptoms in this sample-

Unfortunately, men with depression in this sample were more likely to perceive their telehealth consultation negatively in comparison to traditional in-person healthcare. Similar results were reported by Isautier et al. (2020) who highlighted that telehealth consultations themselves can be stressful, and that telehealth for mental health consultations was generally perceived as less effective. Mental health clinicians and researchers stressed that physically attending a consultation is therapeutic in itself, in that face-to-face interaction is what many patients require (Nicholas et al., 2021; Silver et al., 2020). Especially via telephone, telehealth consultations can lack a connection, or therapeutic bond between the patient and the practitioner, which is seen as crucial in reducing the stigma of treatment for men (Phimphasone-Brady et al., 2021; Seidler, Rice, Ogrodniczuk, Oliffe, & Dhillon, 2018). The absence of interactions such as these may be especially troublesome for men with mental health conditions who are also unable to socially engage with friends and family in-person due to pandemic restrictions (Silver et al., 2020). Although these reasons may clarify why the men with clinically significant depressive symptoms in this sample perceived telehealth negatively compared to in-person care, it is important to note that some care may have been better than no care at all for these men. While in-person connections may be best practice, interactions via telehealth may nonetheless provide some men with much-needed therapy and support in uncertain

times (Silver et al., 2020). Indeed, a systematic review of global tele-mental health services during the pandemic documented interventions which provided feasible and accessible treatment to those in need (Ali et al., 2021). Other studies also reported on self-directed online therapies which were found to be effective in reducing mental ill-health symptoms during the pandemic (Mahoney, Li, Haskelberg, Millard, & Newby, 2021). Although telehealth consultations may not be a sufficient replacement for the therapeutic connections offered by in-person consultations, in combination with internet health information and online therapies, telehealth may provide temporary support for men during times of restriction.

Age. Prior to the COVID-19 pandemic, healthcare providers were often hesitant to endorse telehealth consultations for older patients due to their limited access to the internet (Dorsey & Topol, 2016; Zajac et al., 2012), potential sensory and cognitive abnormalities (Batsis et al., 2019), and a view that telehealth was not suitable for older patients (Koivunen & Saranto, 2018). Perhaps for similar reasons, a study of over one million patients found that participants over the age of 65 were 76% less likely to choose a telehealth consultation over an in-person visit compared to younger patients (Reed et al., 2020).

The outbreak of the pandemic seemed to change these preferences for in-person health services. For the first time, many elderly patients utilised telehealth services to avoid delaying care or risking infection with COVID-19. This is reflected in the results of this study, which suggest that older men were no less likely to utilise telehealth services during the pandemic than younger men. Similar trends have been reported overseas (Atherly et al., 2020; Schulz et al., 2020), while within Australia, elderly people sometime used telehealth more than their younger counterparts (Isautier et al., 2020). In line with the results of this study, other findings also suggested that age had no impact on the satisfaction of patients with their telehealth consultation during the pandemic (Vosburg & Robinson, 2021). In some cases, older patients even reported higher levels of satisfaction (Ramaswamy et al., 2020). These emerging results suggest that older men's attitudes about the

acceptance and suitability of telehealth services have changed largely out of necessity due to the pandemic. They also demonstrate the importance of understanding the differences between pre-pandemic telehealth services characterised by underutilisation, compared to the more common and essential nature of telehealth during the pandemic. While patients and practitioners had previously exhibited scepticism about the applicability of telehealth, the pandemic may have served as a tipping point for the uptake and acceptability of telehealth not just for older patients, but the general population of men too.

Strengths

This study contributes to a rapidly growing body of telehealth literature which has emerged since the start of the COVID-19 pandemic. While most of this research employed gender-comparative approaches that explained little about the nuances within men's telehealth experiences, a major strength of this study was its exploration of the unique characteristics and needs of men, a group which are consistently underrepresented in the literature (Galdas et al., 2005). This study also benefited from the guidance of the Andersen (1995) Behavioural Model, specifically its theoretical organisation of the variables based on the potential causal impact of the characteristics of men on their telehealth usage and comparisons to in-person care. To the knowledge of this researcher, this study is the first of its kind to focus specifically on men's usage of telehealth services and their comparisons to in-person care.

Although men are often blamed for their poor health service use, this view neglects the role of service providers and national health policies in providing men with accessible and effective healthcare (J. A. Smith et al., 2006). The emphasis on men in this study provides insights into the suitability of telehealth for males which can broadly inform public health campaigns and guide practitioners when making decisions about what format a useful consultation should take.

The present study also contributes to literature which challenges the myth that men are not active in their own health care by documenting their transition to telehealth during the pandemic.

Potential limitations in the suitability of current telehealth services for some mental health conditions are also highlighted. This was achieved by gathering data not just on the usage of telehealth services by men, but also valuable information on how they perceived their experience of telehealth in comparison to in-person healthcare.

Limitations and recommendations for future research

Although this study benefited from a large sample, almost all of the men were older, Caucasian, and suffered from comorbid chronic conditions. While valuable insights can be gained from an analysis of this group, the results are not necessarily generalisable to the wider population of men. Research into young men's interactions with telehealth may highlight predictors of telehealth usage that rely more on predisposing characteristics and enabling resources rather than factors of need. Attention should also be given to assessing the engagement and acceptability of telehealth for Aboriginal and Torres Strait Islander populations. While pre-pandemic studies demonstrated the feasibility of telehealth for these communities (Caffery, Bradford, Wickramasinghe, Hayman, & Smith, 2017; A. C. Smith, Armfield, & Caffery, 2019), research exploring the telehealth experiences of this particularly vulnerable population during the pandemic is yet to be published.

Methodological limitations of this study relate to constraints in the data assembled in MAILES. Initial plans to use data on masculine traits from a previous wave of the MAILES study were hindered by high rates of missingness which precluded the inclusion of this variable in the hierarchical regression models. This limitation was somewhat overcome by conducting an independent samples *t*-test, though no differences in telehealth usage based on masculine traits were found.

The data collection methods in MAILES also produced limitations. Questionnaires were collected until March 2021, but participants were asked about their telehealth experiences from March 2020. It is plausible that men who submitted their questionnaires closer to 2021 struggled to

remember events from the year before. Data on depression was also problematic due to differences in measurement between FAMAS and NWAHS participants. This limitation was partially resolved by using the clinical cut-offs of each inventory to indicate the presence of depression, but this may have led to a reduction in statistical power.

Although it was not within the scope of this study, the value of qualitative data provided by a group of men who have used telehealth services during the pandemic cannot be understated. Such information would add context and depth to existing quantitative data on the subject. Additionally, while it is crucial to understand telehealth from the perspective of the patients who engage with it, healthcare practitioners who deliver telehealth services to men may provide unique insights and alternative viewpoints compared to their patients. Although studies have analysed telehealth provision from the perspective of healthcare providers (James et al., 2021; Vosburg & Robinson, 2021), none of these studies have focused specifically on men. Future research will hopefully remedy this gap in the literature.

Implications

The findings of this study have multiple implications which are relevant to the provision of telehealth services to men during the COVID-19 pandemic. Firstly, telehealth appears to be a popular and acceptable method of healthcare delivery for men with chronic conditions. Healthcare providers should encourage men to manage their chronic conditions through telehealth services but recommend in-person consultations when a physical examination is required.

Secondly, although men with mental ill-health symptoms may be more likely to utilise telehealth services than men without symptoms, healthcare practitioners should be aware that these men may not find these services as acceptable as traditional in-person care. Telehealth consultations may provide men suffering from mental ill-health symptoms with an alternative to deferring or forgoing care, but the lack of a therapeutic connection between patient and practitioner via telehealth may result in an inferior experience compared to in-person sessions.

Finally, the rapid adoption of telehealth triggered by the pandemic may have changed the popularity and acceptability of telehealth services for older men in Australia. Although practitioners have traditionally been hesitant to engage older men in telehealth consultations, they should be cognisant of evolving attitudes towards telehealth during the pandemic, and practise accordingly.

Conclusions

This study used the Andersen Behavioural Model to examine the characteristics of men who used telehealth services during the pandemic, and their perceptions of telehealth compared to traditional in-person healthcare. Key findings suggest that men with chronic conditions and symptoms of mental illness accessed telehealth services at a greater rate than men without these factors of need. However, their perception of telehealth compared to in-person care differed based on their conditions. Telehealth seemed to provide men with an acceptable service for managing their chronic conditions but may lack the therapeutic connection men with mental ill-health symptoms prefer from their healthcare consultations. Interestingly, age was not associated with men's telehealth usage, or their perceptions of telehealth compared to in-person care, which implies a shift in the suitability of telehealth services for older men since the beginning of the pandemic. Although this research may guide health policy and practise for some older men, further research should explore potential improvements in telehealth delivery for men with symptoms of mental illness, and also assess the viability of telehealth during the pandemic for Indigenous and younger men.

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Appendix

Table: Correlation matrix of predictor variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Age	69.5	9.6	—							
2. Education	2.5	1.1	-.216**	—						
3. Marital status ^a	0.8	0.4	-.017	.043	—					
4. Income ^b	68.1	47.8	-.467**	.383**	.206**	—				
5. Masculine traits ^c	81.4	13.2	-.195**	.043	.159**	.172**	—			
6. Chronic conditions ^d	2.8	2.0	.319**	-.118**	-.027	-.282**	-.120*	—		
7. Anxiety symptoms ^d	9.4	4.1	-.079*	.045	-.068	.033	-.089	.054	—	
8. Depressive symptoms ^e	0.2	0.4	.030	.029	-.189**	-.024	-.147*	.123**	.638**	—

^a 0 = non-partnered, 1 = partnered.

^b Values presented in \$1,000s.

^c Value as MCD-I total score.

^d Value represents number of total chronic conditions.

^d Value represents total GAD-7 score.

^e 0 = no depression, 1 = depression.

* $p < .05$. ** $p < .01$.