Towards Understanding the Chronic Healthcare Needs and Health Services Utilisation of Older Adults in Rural South Australia

By

Dennis Asante

B.A. (Hons.) Political Studies, MSc. Public Management

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College of Medicine and Public Health
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To my beloved mother (Mrs Gladys Asante) and father (Mr Fordjour Asante), siblings, and dearest wife (Josephine Asante) for their unconditional love and support

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ABSTRACT

The rapid expansion of the older aged group within a population over time has become a significant demographic feature across the world. Older adults (≥ 60 years) have complex healthcare needs requiring an increasingly complex range of services to meet these needs. Correctly prioritising services for greatest impact is a major concern for policymakers and service providers across the globe. If health planners do not have adequate information, particularly on vulnerable populations including those in rural communities, it is difficult to design targeted services. Although there is growing evidence that rural and remote older adults experience a higher burden of later-life multimorbidity, the prevalence of conditions of concern, risk factors, patterns of health services use, and their continuing unmet healthcare needs are poorly understood. This thesis directly addresses this problem with the aim of aiding rural health service planners and providers.

There are four connected studies. The first study examined the prevalence of chronic physical and mental health conditions and their effects on visits to general medical practitioners by rural and urban older adults. The second study examined rural-urban differences and factors associated with the outpatient use of specialist doctor services by older adults. In the third study, the relationship between multimorbidity and psychological distress and their impact on health services use specific to rural older adults was investigated. Finally, the fourth study explored the perceptions by older adults of unmet care needs, barriers to care access and facilitators of care use in rural areas.

This research project adopted a sequential mixed methods design. The first three studies analysed quantitative data from the South Australian Monitoring and Surveillance System (SAMSS) survey, a state population-based survey. The data sourced from SAMSS for this study included 20,522 (urban= 13498, rural= 7024) participants aged 60+ years. The associations found in the data suggested areas for qualitative exploration in the final study. The qualitative data came from 35 participants comprising 20 older adults (60+ years) self-reporting chronic health conditions, and 15 health service providers recruited from rural areas.

The findings of the early parts of this program of research indicated that:

1. the chronic physical and mental health burden was similar across urban and rural areas,
2. the frequency of general practitioners attendance by older people was also similar across rural and urban areas, and

3. physical and mental health conditions had independent associations with the frequency of general practitioner consultations in urban and rural areas.

However, the early findings also revealed important differences between older people living in urban and rural areas that required further detailed investigation:

1. older people in rural locales were more likely to visit a general practitioner for mental healthcare assistance than their urban counterparts and
2. rural older adults were less likely to access specialty care services than those in urban areas.

The third study, focusing on rural older people alone, revealed that

1. multimorbidity increased with female gender, lower education and increasing age, whereas
2. high psychological distress also increased with female gender and lower education but decreased with increasing age.

Reinforcing the findings in the earlier study, psychological distress and multimorbidity remained independently associated with health services use. Seeking further understanding, the interview data in the fourth study revealed four important unmet care needs for rural older people:

1. chronic disease management,
2. specialist care,
3. psychological distress, and
4. formal caregiving.

These services were mainly constrained by workforce shortages, lack of continuity of care, transportation difficulties, and long wait lists. Where available, social support, self-efficacy, and a positive attitude shown by healthcare professionals facilitated timely use of available services.

These findings raise important new questions for rural policymakers, rural health service planners and rural health researchers. Given the known constraints on rural health service resources, can all four identified unmet needs be addressed simultaneously? This is unlikely given the known rural health workforce deficits that reflect a market failure to provide equitable workforce distribution despite the evidence in this study for equivalent demand. However, this research has demonstrated that psychological and chronic disease factors are independently associated with service utilisation. Therefore, if, as this research also suggests, rural older adults are prepared to see their general practitioner more frequently for mental health issues, could designing more effective interventions specifically for psychological distress in older adults present an opportunity to reduce the demand on

specialist services and services for other aspects of chronic disease, including demand on emergency services?

The empirical findings also suggest that there are significant resilience factors in the rural health system that may present novel alternative to rural health policy options. Could building on consumer self-health efficacy, investing in rural social support systems, and recognising and reinforcing positive attitudes in rural health service providers be leveraged to encourage appropriate and timely use of needed services?

Thus, this thesis has systematically identified strategically important areas to empirically guide interventions to improve health services for older adults living in rural areas. These interventions may be different to those for older adults living in cities. As the current demographic trends suggest an ongoing increase in the percentage of older adults living in rural Australian towns, this research is timely and can assist in the wise application of scarce resources to address the likely increase in both health service demand and need.

CO-AUTHORSHIP

The four manuscripts included in this thesis were prepared in collaboration with my supervisors, Dr. Vivian Isaac, and Prof. Craig S *McLachlan*. In addition, the studies described in Chapter 5 'specialist care visits outside the hospital by South Australian older adults' was co-authored by Agyemang-Duah Williams, Dr. Fiona Stanaway, Prof. Paul Worley. The study in chapter 6 'Psychological distress, multimorbidity and health services among older adults in rural South Australia' was co-authored by Dr. Josephien Rio, Dr. Fiona Stanaway, and Prof. Paul Worley. The final study described in chapter 7 'Understanding unmet care needs of rural older adults with chronic health conditions: a qualitative study' was co-authored by my advisors and Dr. David Pickles. I was responsible for conceptualising the study questions and methodology, carrying out the statistical analyses, and writing the manuscripts as the main author. In many facets of this project, my co-authors offered advice and support, particularly when it came to project conception and design (my supervisors only) and article revisions (all co-authors).

It is worthy to note that this PhD project was a rural focus study using rural South Australia as a context specific area. Identified stakeholders including Prof. Paul Worley the former rural health commissioner of Australia and current Executive Director Clinical Innovation at RMC local health network, and the other local collaborators listed were involved at different stages providing critical feedback and advise and reviewed the final manuscript.

DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text; and all other substantive contributions by others to the work presented, including jointly authored publications, are acknowledged.

Signed.....

Date.....

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Please note, an editor has not been used in the production of this thesis.

LIST OF PUBLICATIONS

1. *Asante, D., McLachlan, C. S., & Isaac, V. (2022). The prevalence of chronic physical and mental health conditions in older adults across South Australia and their independent effects on general practitioner visits. Journal of Applied Gerontology, 41(4), 962-970.*
2. *Asante, D., Rio, J., Stanaway, F., Worley, P., & Isaac, V. (2022). Psychological distress, multimorbidity and health services among older adults in rural South Australia. Journal of Affective Disorders, 309, 453-460.*
3. *Asante, D.; McLachlan, C.; Pickles, D.; Isaac, V. (2023). Understanding Unmet Care Needs of Rural Older Adults with Chronic Health Conditions: A Qualitative Study. Int. J. Environ. Res. Public Health, 20, 3298. https://doi.org/10.3390/ ijerph20043298*
4. *Asante, D., Agyemang-Duah, W., Stanaway, F., Worley, P., & Isaac, V. Specialist care visits outside the hospital by South Australian older adults. Australian Journal of Rural Health, (Under Review)*
5. **Asante, D., Asante, B., Addai, B., Agyemang-Duah, W., & Ankrah Twumasi, M. (2022). Effect of financial services access on health services utilisation among rural older adults in Ghana. International Journal of Social Welfare, 31(4), 492-505.*
6. **Asante, D., Twumasi, M. A., Sakyi, A. S. K., Gyamerah, S., & Asante, B. (2022). A socio-geographic perspective of health and economic impacts of COVID-19 on poor households in Ghana. GeoJournal, 87(5), 4113-4125.*
7. ** Asante, D., & Isaac, V. (2023). Gender differences in the association between living alone, chronic disease and health service use. Journal of suicidology, 18(1), 434-440.*

Note: *Contents of articles with asterisks (*) in front are publications during the student's candidature but not included in this thesis.*

LIST OF CONFERENCE PROCEEDINGS

1. *Asante, D., McLachlan, C. S., & Isaac, V.* (2021). *Do older adults in rural areas visit GPs for their physical or mental health care needs? Poster presentation at the 54th Australian Association of Gerontology National Conference, Gold Coast, Australia. November 2021.*
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4. *Asante, D., McLachlan, C. S., & Isaac, V. (2023). Understanding unmet needs of rural older adults with chronic health conditions. Oral presentation at the 9th National Rural Health Scientific Symposium, Canberra, Australia. July 2023.*
5. *Asante, D., Agyemang-Duah, W., Stanaway, F., Worley, P., & Isaac, V. (2022). Which older Australians use specialist care services? Poster presentation at the 55th Australian Association of Gerontology National Conference, Adelaide, South Australia. November 2022.*

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LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
ADLs	Activities of Daily Living
AGECAT	Automated Geriatric Examination for Computer Assisted Taxonomy
AIHW	Australian Institute of Health and Welfare
AMA	American Medical Association
COTA	Council on the Ageing
CVDs	Cardiovascular Diseases
DALY	Disability-adjusted Life Years
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders
ED	Emergency Department
GAD	Generalized Anxiety Disorder
GMS	Geriatric Mental State Examination
GP	General Practitioner
HSU	Health services utilization
ICD-10	International Classification of Diseases, Tenth Revision
MIPAA	The Madrid International Plan of Action on Ageing
NCDS	Non-communicable diseases
NRHA	National Rural Health Alliance
OECD	The Organization for Economic Co-operation and Development
PD	Psychological distress
QOL	Quality of life
SAMSS	South Australian Monitoring and Surveillance System
SDAC	Survey of Disability, Ageing and Carers
SES	Socioeconomic Status
SRH	Self-rated Health
TFR	Total Fertility Rate
UK	The United Kingdom
UN	United Nations
US	The United States of America
WHO	World Health Organization

DDA	Disability Discriminatory Act
COPD	Chronic Obstructive Pulmonary Disease
DYNOPTA	Dynamic Analyses to Optimise Ageing
RRMA	Rural, Remote and Metropolitan Areas
ARIA	Accessibility/Remoteness Index of Australia
ASGC-RA	Australian Standard Geographical Classification-Remoteness Areas
MMM	Modified Monash Model
HREC	Human Research Ethics Committee
EWP	Electronic White Pages
SA	South Australia
CI	Confidence Interval
OR	Odds Ratio
CATI	Computer-assisted Interviewing Technology
SPC	Specialist Care
SD	Standard Deviation
SDG	Sustainable Development Goal
K10	Kessler Psychological Distress Scale
TAFE	Technical and Further Education
RMCLHN	Riverland Mallee Coorong Local Health Network
SAPHS	South Australian Population Health Survey

CHAPTER

1

INTRODUCTION

1.1 Overview

Presently, the world is witnessing incredible demographic and epidemiological shifts, the speed of which is unparalleled. Generally, population ageing is a result of declining fertility and mortality rates (World Health Organisation, 2015; Rudnicka et al., 2020). There are marked differences in ageing between countries and even across geographical locations within countries. For instance, the rates of population ageing in rural locations of most advanced countries such as Australia are higher compared to metropolitan areas (Australian Institute of Health and Welfare, 2023). Depending on many factors including loss of functionality, mortality and life expectancy rates, an older adult has been delineated in the literature differently in different regions and countries. Whereas an individual aged 65 and over is described as an older person within the general population in Australia, an older person is defined within the Aboriginal and Torres Strait Islander population as a person aged 50 years or above due to poorer health outcomes and lower life expectancy rate for indigenous people (71.6 years) compared to non-indigenous people (80.2 years) (Australian Institute of Health and Welfare, 2023). As a result of the differences in defining older adults in Australia (Indigenous vrs non-Indigenous people), and also this study's focus being rural, the World Health Organisation's (2017) definition of older adult as individual 60 years or over was adopted in this thesis.

Demographic ageing[1] is a prevailing trend in almost every country worldwide, with several associated health and economic implications (Ezeh, Bongaarts, & Mberu, 2012; Lutz, Sanderson, & Scherbov, 2008; World Health Organisation, 2015). This phenomenon has instigated a considerable debate in academic circles, international forums, and policy arenas about how to effectively meet the healthcare demand of the ageing population since ageing is associated with a high risk of multimorbidity[2]. The ageing-multimorbidity health linkage becomes more crucial in the event where population ageing is more profound on a global scale. Chronic physical and mental health conditions are increasing in older adults (Baladón et al., 2016; Lin et al., 2011; Ofori-Asenso et al., 2019) and older individuals in rural areas, in most cases, bear the higher brunt of chronic health conditions (Koley & Sarkar, 2022; Ma, He, & Xu, 2020). Even though there is a significant body of evidence indicating that the level of healthcare services demand increases with ageing, questions remain concerning (a) the effects of comorbid physical and common mental health conditions on health services use in later life, (b) patterns of and, factors associated with medical specialty care use, and (c) perceptions of unmet needs and barriers to care access for rural older adults with complex chronic diseases. Therefore, the overarching aim of this study is to explore patterns and factors of health services use and perceptions of unmet care needs among rural older adults (≥ 60 years) living with complex chronic health

[1] A shift in the age distribution of a population over time toward older ages (Demeny & McNicoll, 2003)
[2] Coexistence of two or more chronic health conditions (Fortin, Bravo, Hudon, Vanasse, & Lapointe, 2005)

conditions in South Australia. To achieve this aim, the first objective of this thesis was to examine the prevalence of chronic physical and mental health conditions in older adults in South Australia and how these conditions impact older people's use of general medical practitioners services.

Specialist doctors provide diagnostic and treatment services for specific ailments and help in managing complex chronic health conditions. Specialist care services (particularly geriatric services) are crucial for chronic health management to ensure improved quality of life and independent living in old age (Ettelt et al., 2006). However, the levels of older adults' use of specialist care services in rural and remote communities has been a persistent concern in many countries (van Gaans & Dent, 2018). Therefore, another objective of this thesis was to investigate factors associated with older adults' visits to a specialist doctor and highlight any rural-urban differences in specialty care services use in South Australia. Herein, the thesis draws on Andersen's model of health services use to explore factors and key predictors of specialist doctor services use.

Recent research discussions of the World Health Organisation's (WHO) policy stance on 'healthy ageing' and 'ageing in place' have increasingly focused on disaggregated data and a more fine-grained analysis of contextual factors such as remoteness characteristics that may affect ageing and health (Davies & James, 2016; Sixsmith & Sixsmith, 2008). This research direction aligns with the 'Madrid International Plan of Action on Ageing' which has been advocating for evidence-based and targeted programs to promote healthy ageing across the world (Sidorenko & Walker, 2004). Hence, a further objective of this thesis was to focus on rural older cohort in South Australia and investigate the burden of multimorbidity and its relationship with psychological distress and health services use. Moreover, relatively few studies have paid attention to rural older adults' values, preferences, lived experiences and perceptions regarding their healthcare needs and care services use (Brundisini et al., 2013; Goodridge et al., 2019; Goodridge et al., 2011; King et al., 2006). In particular, quantitative datasets that capture the underlying reasons for rural older people's use and/or underutilisation of needed care services are limited. As a result, a mixed methods research approach which is noted in health sciences to provide more complete information on critical issues and captures the voices of the population of interest was adopted in this thesis (Guetterman, Fetters, & Creswell, 2015; Ivankova & Kawamura, 2010; Plano Clark, 2010). Accordingly, the final objective was to understand perceptions of unmet care needs of rural older people, barriers to care access and facilitators of care use in rural areas through qualitative interviews with rural older patients in South Australia and their healthcare providers.

Overall, this thesis was designed to contribute to our understanding of contextual factors of ageing and health services use in rural areas using South Australian data. Hence, the study not only

contributes important and original knowledge to literature but also verifies existing knowledge along the following summary points:

i. The findings show that psychological distress, in the presence of multimorbidity, is an independent predictor of high healthcare demand among rural older people
ii. Contrary to the reported higher prevalence of chronic health conditions in rural areas, the findings of this thesis indicate an equal prevalence of chronicity in South Australian older adults
iii. This study confirms the reported underutilisation of specialty care services by rural older people compared to their urban counterparts. However, the current thesis shows that specialty care use is not entirely tied to access but also to demographic and socioeconomic factors
iv. The empirical findings also suggest that there are significant resilience factors such as social support, self-health efficacy, and positive provider attitudes in the rural health system that may present novel alternative rural health policy options
v. Theoretically, the thesis contributes to the utility of the Andersen's behavioural model of health service use in qualitative research designs and identifies new factors of services use to expand this model.

1.2 Study Background

The concept of ageing populations is relatively new from a historical perspective. In the year 1950, no country in the world had more than 11% of its population aged 60 years and over. During the year 2000, the highest percentage of older adults recorded in a country was 18%. However, current projections indicate that in 2050, the number of older adults aged 60 and above will outnumber adolescents aged 10-24 (United Nations Population Division, 2020; Rudnicka et al., 2020). Specifically, older individuals 60 years and over will increase from 1 billion to 2.1 billion (i.e., 21.1% of the world population) by 2050 (World Health Organisation, 2020), and those 80 years and above are also expected to triple by the same period to reach 426 million. Historically, the number of older adults in the 1950s increased from 200 million to approximately 901 million in 2015, accounting for 12.3% of the world population (United Nations, 2014; World Health Organisation, 2015). These statistics indicate a five-fold increase in the older adult population since the establishment of the World Health Organisation (Gyasi, 2018). The current trend of ageing is expected to be enduring such that the population of older cohorts will outnumber children for the first time in world history by 2047 (United Nations Department for Economic Social Affairs and Population Division, 2001; United Nations, 2014).

In Australia, population ageing has been consistent over the past decades due to the significant fall in fertility during the 1920s which was further lowered and sustained by the economic depression in the 1930s (McDonald, 2016). However, the country's accelerated ageing population was momentarily checked during the 1950s through to the 1960s because of higher fertility rates that greeted the 'baby boom' years. It has been reported that the number of babies delivered in Australia between 1946 and 1965 outnumbered the new births witnessed in the previous two decades by 1.63 million births (McDonald, 2016, 2017). Currently, the 'baby boomers' are approaching retirement age and are replacing the 1926-1945 generation which was much smaller in number. Moreover, mortality rates in later life have been falling over the years in the country. For instance, between 1920-1922, life expectancy for males at age 65 was 12 years. By 2012, this figure substantially increased to 19 years due to medical breakthroughs and advancing technologies (McDonald, 2017). These phenomena account for the rapid population ageing since 2010 that is expected to balloon in the 2050s and beyond. Between 1999-2019, the country's population aged 65 years and above rose from 12.3% to 15.9% (Australian Bureau of Statistics, 2018). With the current rate of increase, it has been projected that the percentage of the older population cohort would reach 28.4% by 2053. The rapid increase of the country's older population segment is expected to cause a proportional increase in the burden of non-communicable chronic conditions.

Non-communicable diseases (NCDs) such as diabetes, cancers, respiratory diseases, and cardiovascular conditions remain extremely high among older individuals. Other common conditions associated with increasing age include osteoarthritis, hearing loss, obstructive pulmonary disease, cataracts, and various forms of arthritis (World Health Organisation, 2020). These conditions are associated with frailty (Marengoni et al., 2018; Monaco et al., 2020; Palmer et al., 2018) resulting in decreased quality of life and adverse health outcomes. Ageing and complex disease have been widely studied within the fields of gerontology and public health. A good number of cross-sectional studies, meta-analyses, and systematic reviews have shown that more than half of older people aged 65 years or above have two or more chronic conditions (Fortin et al., 2005; Gavino, Isaac, & McLachlan, 2018; Kastner et al., 2018; Lin et al., 2011; Ofori-Asenso et al., 2019) and that increasing age is associated with a higher count of chronic health conditions. For instance, a synthesis of empirical evidence on multimorbidity in older adults has revealed that between 80- 82% of the oldest old population group (85 years or over) are suffering from multiple chronic (≥3) conditions (Salive, 2013). A review of patterns of multimorbidity among older adults in developed countries such as Australia has been studied. Pooling together data published between 2007 and 2017, Ofori-Asenso and colleagues (2019) have reported between 62%-78% multimorbidity rate for older adults aged 65 years and above. The authors further reported that most studies that stratified multimorbidity prevalence by age indicated a

higher burden of multimorbidity among older people who are 80 years and above. A similar prevalence of multimorbidity in older adults has been reported in different health systems and cultures that show similar ageing profile as Australia (Chang et al., 2019; Ghazali et al., 2021; Nunes, Thumé, & Facchini, 2015).

Physical and mental morbidities may exist in an individual in several combinations or complexities. Older people may suffer multiple chronic physical health conditions cohabiting with a mental health condition(s) such as depression, anxiety, and psychological distress. It is also possible for older individuals to experience comorbidity of only physical health conditions. Nevertheless, physical and mental health are interconnected such that poor physical health may be a risk factor for the onset of mental problems and vice versa.

Several sociodemographic profiles have been found to be associated with multimorbidity. Studies conducted in Australia have indicated that female gender, lower education, ageing, and low income are significantly associated with multimorbidity (Hunter et al., 2021; Shi et al., 2015). The association between multiple chronic conditions and sociodemographic variables is not exclusive to Australia. Using different data sources to assess multimorbidity in older adults in Canada, Gontijo et al. (2019) reported that lower education, female gender, and lower income levels were associated with complex multimorbid health conditions. Females (67.3% IQR 62.8-77.3) were found to have higher rates of multimorbidity than males (64.8% IQR 56.3-73.4) in pooled data across the developed world (Ofori-Asenso et al., 2019). Relatedly, multimorbidity was higher in older women and individuals with poor socioeconomic status in a Brazilian study (Nunes et al., 2015). Among other factors, unemployment was found to be associated with a higher risk of multiple health conditions in older adults aged 60 years or over in Malaysia (Ghazali et al., 2021). Also, multimorbidity has previously been found to be a risk factor for many mental health conditions such as severe psychological distress (Cheng, Yinjun, & Jie, 2022; Fortin et al., 2006; Swartz & Jantz, 2014).

Psychological distress refers to non-specific symptoms of stress, anxiety, and depression and is a widely used indicator of mental health and well-being in population health and ageing surveys (Forcadela et al., 2020). As indicated earlier, psychological and physical health are intertwined. Older adults living with multimorbidity are more likely to experience higher levels of psychological distress (Hopman et al., 2016; Sfyrkou, 2015; Steptoe, Deaton, & Stone, 2015). The risk of developing psychological problems was 1.5-4 times higher in multimorbid patients compared to the general population (Zalai, Szeifert, & Novak, 2012). Unhealthy lifestyle behaviours such as smoking, poor dieting, and alcohol consumption have been related to psychological distress in older adults (George et al., 2022; Grieger et al., 2022). Psychological distress is also associated with higher progression

rates to severe mental health conditions such as Alzheimer's disease, Vascular dementia, Parkinsons, and mixed dementia (Atkins et al., 2013) and decreased functional ability (Penninx et al., 1996). Importantly, mental health conditions co-existing with physical chronicity is a significant predictor of poor quality of life (QOL) and well-being in older people and is associated with higher health services needs. The prevalence of complex multimorbidity of physical and mental conditions may not be evenly distributed in older adult populations in Australia given that marked geographical differences have been reported in the general population (Australian Institute of Health and Welfare, 2022).

1.2.1 Rural-Urban Health Disparities in Chronic Disease Prevalence and Health Outcomes

It has been shown that a significant portion of older people in Australia live in rural and regional communities (Australian Institute of Health and Welfare, 2023). Specifically, nearly 23% of Australia's older adults live in regional areas, 11% in outer regional communities, 1.2% in remote locales, and 0.5% in very remote communities. This points to about 36% of the country's older population in rural communities. Older populations in rural Australia are growing faster (2.93% per annum) compared with the general population growth (1.31%) in these areas (Australian Bureau of Statistics, 2022). This notwithstanding, health and care needs of this vulnerable subpopulation group has not attracted enough research attention.

Presently, research projects exclusively examining rural-urban differences in the prevalence of physical and mental conditions among older adults in Australia are limited; however, information on the general adult population is available. It has long been established in Australian literature that rural (vs urban) populations experience a higher rate of complex morbidities and poorer health outcomes (Australian Institute of Health and Welfare, 2000; Jong, Vale, & Armstrong, 2005; Lau & Morse, 2008). Reports from the Australian Institute of Health and Welfare have consistently highlighted that the health of Australians living in rural and remote areas, particularly Indigenous people is comparatively worse than those in major cities (Australian Institute of Health and Welfare, 2019a, 2022b). For instance, while cancer rates and risk factors were largely similar across rural and urban South Australia, the survival rate among rural patients was lower than their urban counterparts (Wilkinson & Cameron, 2004). Suicide rates have been more prevalent in rural Australia than in metropolitan areas (Fitzpatrick et al., 2021; National Rural Health Alliance, 2017). Also, residents of rural and remote locales have higher risks of anxiety disorders (Andrews, Henderson, & Hall, 2001). These findings from the general adult population presume that rural older adults may be experiencing disproportionate burdens of morbidities in Australia.

Despite the dearth of exclusive literature on rural-urban health disparities for older adults in Australia, international studies have suggested a higher burden of diseases in rural older people. Older adults in rural communities in the United States experienced a higher prevalence of multiple chronic ailments than metropolitan older individuals (Kumar & Acanfora, 2001; O'Connor & Wellenius, 2012), including coronary heart conditions and diabetes. Similarly, rural older people have a higher likelihood of living with obesity with a prevalence rate of 24% for urban and 29% for rural areas (Cohen et al., 2017). Rural-urban health disparities are also prevalent in several domains of well-being, including mental health and functional abilities (Cohen et al., 2018). After accounting for known potential sociodemographic confounders, rural older adults were found to have a higher prevalence of depression (Probst et al., 2006) and suicide (McCarthy et al., 2012), declined functional abilities (Baernholdt et al., 2012), and poorer self-rated health (Dilworth-Anderson, Pierre, & Hilliard, 2012). Even though these disparities are well-documented, rural populations, unfortunately, have limited access to health services.

Research and advocacy organisations (e.g., National Rural Health Alliance-NRHA, Council on the Ageing-COTA Australia), scholarly articles, and state agencies (e.g., Australian Institute of Health and Welfare, Australian Bureau of Statistics) reporting on population ageing and chronic healthcare demand in Australia have all highlighted older adults in rural and remote environments as an underserved or under-treated segment of the population regarding needed healthcare services. Even with the limited services, older people in rural areas have been shown to use less specialised care services available partly due to socioeconomic disadvantages and a higher sense of self-reliance (Crabb & Hunsley, 2006). Complicating the issue is that the older populations have been increasing more rapidly in rural and remote Australia. This phenomenon has been attributed to the persistent movement of younger people to urban areas for higher education and employment opportunities (Australian Institute of Health and Welfare, 2023). Access to healthcare resources needed to manage chronic diseases that older people are more prone to experience are limited in rural areas (Australian Bureau of Statistics, 2014). It is noteworthy to emphasis that most of these rural older individuals live in areas where there is limited community support services (Australian Bureau of Statistics, 2018). Although the prevalence of many chronic conditions are largely similar across rural and urban Australia, some conditions are reported more frequently in rural older people. For instance, mental and behavioural diseases such as asthma, arthritis, obstructive pulmonary conditions (Australian Institute of Health and Welfare, 2023), and suicide behaviours (Crnek-Georgeson, Wilson, & Page, 2017) are more prevalent in rural older people.

With this insight from the national data, some researchers (McPake & Mahal, 2017; van Gaans & Dent, 2018; Vecchio, Davies, & Rohde, 2018) have emphasised the urgent need for research projects analysing the determining factors of rural older people's use of health services, and this has started attracting attention (Bourke et al., 2012a, 2012b; Henderson et al., 2014; Henderson et al., 2018; Muir-Cochrane et al., 2014). However, it must be noted that older adults in rural settings of Australia are a heterogeneous group in terms of care needs, socioeconomic, and ethnic backgrounds, and that health services research should consider this diversity.

While studies on rural older adults' use of mental health services continue to grow (Batterham et al., 2020; Henderson et al., 2014; Henderson et al., 2018; Parslow & Jorm, 2000), information regarding patterns and factors associated with their use of other critical care services in a comprehensive manner is relatively scant. Moreover, the opinions of rural older adults with complex chronic conditions and that of their care providers in understanding need perceptions, and the barriers and facilitators of services use in rural Australia have not been previously documented in a composite manner. Therefore, exploring the specific factors of rural life that drive disparities in the use of services may aid policymakers and health practitioners to target potentially modifiable factors in rural areas to improve health outcomes of rural older adults. This thesis seeks to contribute knowledge in this area by examining the factors of services use by older adults with complex health conditions and highlighting need perceptions, barriers to, and facilitators of care access in rural areas.

1.2.2 Healthcare Access and Services Utilisation by Rural Older Adults

The issue of access to health services has dominated the rural healthcare discussion over the years (DesMeules et al., 2006; Lishner et al., 1996; Pharr et al., 2014; World Health Organisation, 2010). Although access is a complex concept evaluated on several dimensions in healthcare research, it can be broadly expressed as the availability and adequate supply of services, with limited or no barriers to obtaining and using the services by the population (Parsons, Gaudine, & Swab, 2021). Farmer et al. (2010) have noted that access to health services is a crucial concern for rural and remote residents globally. Similarly, systematic reviews of extant literature have confirmed rural people's limited access to health services. Several of these studies linked limited access to care services to poorer health outcomes in rural populations (Brundisini et al., 2013; Dassah et al., 2018; Lishner et al., 1996; Ohta et al., 2022; Vergunst, 2018). Infrastructural deficits and inadequately trained health professionals have been linked with limited access to health services in rural environments (Bocker et al., 2012).

Limited access to required health services by older adults has been described in the context of rural Australia. Assessing the size and distribution of government-funded geriatric mental health services in New Zealand and Australia, O'Connor and Melding (2006) reported that the distribution of these services was woefully uneven, with limited coverage in rural locales. Systematically pooling data on the difficulties older Australians face when accessing healthcare services, van Gaans and Dent (2018) found rural and remote older adults to have several unmet care needs due to factors such as transportation, long waiting times for appointments, accommodation in cities, and affordability. Probing these issues further, a recent report suggested that a good number of rural and remote older Australians did not have easy access to hospitals or primary healthcare (Gardiner et al., 2019). These vulnerable individuals including Indigenous people usually travel for more than an hour to reach health services, including primary care, hospitals, emergency departments, and rehabilitation and management services (Gardiner et al., 2019). This report corroborated similar findings discussed on healthcare services access for older adults in rural communities across Australian states and territories (Giles et al., 2009; Henderson et al., 2014; Henderson et al., 2018; Mariño et al., 2014). Access challenges are known to influence service utilisation in older populations.

As discussed above, rural older adults are reported to experience limited access to care services to manage their conditions, hence, they are reported to use health services, particularly speciality care at lower levels than their urban counterparts (Cairney, Corna, & Streiner, 2010; Corna, Cairney, & Streiner, 2010; Crabb & Hunsley, 2006). The underutilisation of health services among rural older adults is associated with distance to care facilities, socioeconomic status, and availability of services (Parsons et al., 2021;Henderson et al., 2014). This notwithstanding, a study has indicated that distance had no effect on older peoples' use of GP services in rural and urban locations (Mohan, Nolan, & Lyons, 2019). Mohan and colleagues argued that the number of GPs within a facility rather, had a significant effect on GP visits by older patients. However, getting access to GPs in rural Australia is complicated by the maldistribution of doctors across different rural areas (Henderson et al., 2014). Older people in rural areas may access GP services for both physical and mental care needs. Cairney et al. (2010) indicated that only a little over one-third (37%) of older people who met the criteria for a past-year mental health problem had utilised mental health services in that year. This finding suggests that more than 60% of older individuals who probably needed mental health treatment went without it. Relatedly, rural-urban differences in the use of health services for memory-related problems among older people have been studied. Rural participants were found to be less likely to use primary care physicians compared to the urban participants (Chumbler et al., 2001).

Some Australian studies have found significant differences between urban and rural older people in certain aspects of health service utilisation (Australian Institute of Health and Welfare, 2023; Rana et

al, 2019). In these studies, rural people's use of health services were found to be impacted by the limited availability of healthcare services. Similarly, Allan and Cloutier-Fisher (2006) found the use of primary care physicians and specialists, as assessed by the number of visits in rural older adults as lower in comparison with the utilisation patterns of older adults living in urban centres, however, hospital admissions were higher among the former. Similar research exploring differences in the use of health services by older adults living with complex chronic conditions in rural and urban areas in Australia is limited.

The low rate of specialist service use by rural older adults is of concern for many reasons. The prevalence of multimorbidity is increasing in this population cohort (Australian Institute of Health and Welfare, 2022; Jong et al., 2005; Lau & Morse, 2008) and management of complex multimorbidity requires various medical speciality services. Again, evidence of effective treatment of older adults with mental health problems (e.g., psychological distress, depression, and anxiety that are usually comorbid with physical health conditions in older adults) suggests that many rural older people who are not accessing services could be experiencing discernible improvement with treatment (Kok & Reynolds, 2017). Moreover, the number of older individuals in the general population continues to grow with a significant proportion living in rural and remote areas. In fact, in Australia, the percentage of the population over 60 years is expected to rise from the current 16.5% to 23% by 2066 (Australian Bureau of Statistics, 2018; Australian Institute of Health and Welfare, 2021). This increase would mean the number of older people needing health services will also increase. The seminal work of Jeste et al. (1999) have also projected a disproportionate rise in older adults with multiple physical and mental health conditions across the world as the so-called 'baby boomers' reach old age. They argued that improvements in the overall standard of living and medical advancements will lead to greater longevity for those with chronic conditions. They also indicated that the baby boomer generation is expected to be more prone to chronic conditions because of healthcare systems' increasing focus on chronic health management rather than preventive healthcare. The present study responds to this pressing need to understand the needs and use of health services by rural older adults with chronic physical and mental health conditions.

1.2.3 The Behavioural Model of Health Services Use

The current research is guided by a dominant model applied in health services utilisation research, the Andersen's behavioural model of health services use (Andersen, 1995, 2008). In the revised version of the model, Andersen discussed four main aspects of health service use comprising contextual characteristics (e.g., community characteristics, systemic factors), individual variables or personal characteristics (e.g., socioeconomic factors), health behaviours (e.g., health services use),

and outcomes (e.g., satisfaction with care received). Andersen argued that both contextual and personal characteristics influence health behaviours and outcomes. The model also has a feedback loop in which behaviours and outcomes impact subsequent contextual and personal characteristics and outcomes of service use.

To better understand health services utilisation by rural older adults with complex chronic health conditions, the present research focused on two main components of Andersen's revised model (2008): (1) the individual characteristics associated with health service use, and (2) the contextual characteristics associated with health service use. The model proposes three constructs believed to influence health service use: predisposing characteristics, enabling resources, and the need for care.

Predisposing factors are the demographic variables (e.g., age, gender, and ethnicity) that might indirectly impact health service use. Family support, income, health literacy, and other resources or barriers that can facilitate and/or impede service use comes under the enabling resources. Finally, the need for care includes doctor-diagnosed health conditions, symptoms, and personal perception of a need for health services. Researchers who have applied the behavioural model of health service use have investigated the correlates of health services use (Lederle et al., 2021), as well as the unique constellations of correlates within specific groups such as lesbian, gay, bisexual, and transgender (LGBT) individuals (Sutter, 2017), women (Lo et al., 2016), adolescents and general adult populations (Bergeron et al., 2005), and different cultural groups (Shafeek et al., 2022). The disparate results of these independent research projects and others emphasise the importance of examining factors associated with health service use among particularly under-served populations.

Even though Andersen's (2008) model offers a very good conceptual insights into the use of health services, the model is not absolved from limitations. Critics of this model have argued that help-seeking is not necessarily always based on 'rational choice'; hence, investigating help-seeking decisions and behaviours requires a comprehensive model than has been proposed by the behavioural framework (Pescosolido, 1992). Responding to this criticism, the network-episode model of health service which conceptualises help-seeking as a social process was birthed (Pescosolido, 1992; Pescosolido & Boyer, 1999). Similarly, the Goldberg-Huxley model also focuses on the structure of health care systems and how people move through them to receive mental care (Goldberg & Huxley, 1980).

It has also been suggested that Andersen's behavioural model does not fully capture the psychological aspects of help-seeking behaviour. The health belief model (Rosenstock, 1966), which has been validated in a mental health services study (Henshaw & Freedman-Doan, 2009) offers a more

psychological framework of perceptions and beliefs of patients' health behaviours. Further, the theory of planned behaviour by Ajzen (1985) prioritises the role of attitudes and intentions in help-seeking behaviours.

Notwithstanding these limitations, the choice of Andersen's model for this study was based on a number of considerations. First, this model comprehensively captures all the characteristics and aspects (the key variables of health services utilisation) of interest in this study. Second, the model has been previously demonstrated to have an effective capacity to predict health services use by older people (Calsyn & Winter, 2000; Gyasi, 2018; Lippens, 2011). Further, Andersen's behavioural model is arguably the most applied health services research theoretical model and has been employed to investigate various characteristics affecting health services use by a wide variety of cultures and age groups (Heider et al., 2014; Lederle et al., 2021; Travers et al., 2020). The wide application of this model facilitates the discussion of the findings of this study relative to other research reports. Lastly, the data used in the current study is more suitable to be analysed through the theoretical perspective of Andersen's model. It is, however, worth noting that although any of the alternative models discussed above will be useful for future analysis of health services use by older people with complex chronic health conditions, Andersen's model is the best suited for this research's objectives and to help interpret the findings thereof.

1.3 The Present Research

Given the high prevalence of multimorbidity in older adults, their higher need for health services, as well as the service accessibility challenges that characterise rural health systems, it can be anticipated that older people with complex chronic conditions face severe challenges in meeting their healthcare needs in rural settings. However, available research has paid less attention to this subpopulation. Existing studies on rural health have focused on the general rural population. A significant number of the existing research shows that rural residents in Australia grapple with several challenges including limited availability of services, longer waiting times, and the absence of a public transport system when accessing healthcare needs (van-Gaans & Dent, 2018; Henderson et al., 2018; Wakerman & Humphreys, 2019). Wakerman and Humphreys (2019) further discussed the inability of successive governments to solve the workforce shortages and higher employee turnover rates that have characterised the rural health workforce in Australia. The authors corroborated MacLachlan and Mannan (2014) conclusion by attributing the declining primary healthcare services in rural settings to increasing emergency airlifting and the higher rates of intensive care utilisation among rural residents. They posited that access to basic primary care at the time of need is critical to promoting and maintaining good health in remote areas.

While the studies discussed above have contributed data on healthcare challenges in Australian rural environments, most of the reported findings are based on either quantitative or qualitative data. Also, in most instances, the views of older individuals and that of their care providers are not comprehensively factored in the conclusions drawn in the available qualitative studies. Therefore, understanding of the factors associated with older people's health services use and their perceptions of unmet needs is limited (Australian institute of Health and Welfare, 2014). For example, it is not clearly understood how rural older people with complex chronic conditions cope with known rural healthcare challenges to access needed services. The question of whether and to what extent the rural older population meet their healthcare needs is crucial for scientific investigation. Further, Heenan argued that in Australia, the distinctive needs of older people are not fully explored (2006). The limited critical empirical data has led to several misconceptions, stereotyping, and myths (Wenger, 2002). The challenges faced by health service providers and caregivers, as well as the coping mechanisms in attending to the needs of their older patients in rural settings are not well understood.

Again, there are limited Australian studies focusing on older adults living with complex chronic health conditions in rural communities and some of the extant studies have limited theoretical and methodological rigour. A more comprehensive approach of mixed data analysis to unpack experiences and factors that shape patterns of health services use is limited. For example, McPake and Mahal (2017) relied on content analysis to examine approaches to addressing the health needs of Australia's ageing population. However, the study failed to highlight the health challenges and health service use patterns among rural older adults. National data on healthcare for older Australians are available, but a clear understanding of the specific problems of the ageing population in rural communities who require acute and long-term chronic disease management is limited (Gardiner et al., 2019). Aside from the fact that these studies have low and/or no representation of rural data, few of them used a mixed methods approach of data survey and qualitative interviews. This research contributes to improving our understanding of factors associated with rural older people's health services use and their perceptions of unmet needs by employing a mixed methods of retrospective data (secondary data) and interviews with older patients and service providers. Therefore, the evidence gathered in this study makes an invaluable contribution to policy on ageing and chronic health and rural health care in general. Thus, this study could serve as baseline information for ageing, healthcare needs, and rural health services in South Australia. The study further investigates the nature, and the patterns of health services use in later life in rural South Australia. These matters are crucial, given the current scanty data and the anticipated rise in health challenges for the ageing population in Australia in the years ahead. Special interest was also taken to investigate the level of

healthcare access and disparities between urban and nonurban older persons relative to the prevalence of chronic conditions and health services use.

1.3.1 Rationale for Using South Australia as the Case Study Area

South Australia was chosen as a study area based on several factors: First, the long history of Flinders University's (the researcher's affiliate institution) Parallel Rural Community Curriculum (PRCC), a rural clinical teaching programs aimed to increase rural health workforce in rural areas to serve the needs of rural people. The aim of this research, as indicated earlier was in alignment of the ultimate aim of the PRCC which was first ever introduced in 1996 in South Australia. Second, resources availability and the researcher's familiarity with the state's rural and remote environments. The candidate's research institution is a South Australian-based University and most of the resources and support provided by the University were located within the state. Also, the candidate has been living in a rural community of South Australia since the inception of this program. Therefore, the researcher had a firsthand experience of the state's rural health system. Moreover, this study commenced at the begining of the COVID-19 outbreak. The restrictions imposed on public movement made it ideal for the researcher to focus on the state of his residence. Furthermore, South Australia presents an interesting characteristics for ageing and rural health research as discussed below.

South Australia (SA) is a regional state with a population of 1.8 million people of which approximately one-quarter of the residents live in non-urban areas. It is one of the fastest ageing states in Australia with a median age of 41 years, higher than the national median age of 38 years (Australian Bureau of Statistics, 2022). The median age in SA's urban areas (39.3 years) is seven years younger than in its rural and remote areas (46.4 years) (Australian Bureau of Statistics, 2021). South Australia's population includes many individuals with overseas decent or speak a variety of languages, making South Australia one of the most culturally and linguistically diverse states. There are substantial differences in the wellbeing of specific groups within the state. For example, compared with other South Australians, Aboriginal people, migrants, and rural residents are disadvantaged across a broad range of social and economic factors, including education, health, employment, income, and housing. This has placed them at greater risk of poorer life outcomes, and there has been substantial evidence for decades, that, for example, the health of Aboriginal people is significantly worse than that of the non-Indigenous population (Australian Bureau of Statistics, 2017).

South Australia compared with other Australian states and territories, has had higher rates of arthritis, diabetes, osteoporosis, cancer, stroke, back problems, hypertension, and high cholesterol. South Australia is also one of the Australian states with a higher proportion of mental health problems

compared to other Australian states and territories (Australian Bureau of Statistics, 2015b). A report has indicated that about 1 in 5 of adult South Australians live with at least a diagnosed mental health condition (Australian Institute of Health and Welfare, 2022). South Australia ranks first out of the states and territories for people with mental or behavioural problems living with arthritis, at 33.3% (age standardised), above the roughly one in five (19.2%, age standardised) of all persons in South Australia living with arthritis. Also, SA ranks first out of the states and territories for persons aged 75 years and over readmitted to hospital within 28 days of discharge, at 8.3% of overnight hospitalisations (inpatient separations) from psychiatric acute inpatient services that were followed by a readmission to psychiatric acute inpatient service within 28 days of discharge (RoGS, 2020).

Again, South Australia had the highest proportion of people with high and very high levels of psychological distress of all Australian states and territories. (Australian Bureau of Statistics, 2015b). Around one in seven (or 13.6%, age standardised) adults in South Australia was living with high or very high levels of psychological stress(anxiety and depression). However, psychological distress prevalence was much higher amongst persons who lived in the lowest socio-economic status areas of the state (23.5%), persons living with a disability (33.1%), and Aboriginal persons (37.6%). The South Australian rate of adults with high or very high levels of psychological stress for Aboriginal persons is ranked first among the states and territories (RoGS, 2020). Of note, South Australia is predominantly regional with a significant proportion of the population being 60 years or above. The state only ranks second to Tasmania on the ageing profile. The population of those 65 years and over in SA is expected to reach over 30%, compared with the projected 27% for Australia by 2051 (Australian Local Government Association, 2004).

1.3.2 Research Objectives

The previous sections have described how important it is to gain greater insight into the determining factors of health services use in rural Australia by older individuals with multiple chronic conditions. This study thus aims to address this research gap in the context of South Australia. To achieve this broad research aim and to inform a public policy framework to address the health challenges of the older adult subpopulation, the study focuses on the following specific objectives:

1. To investigate rural-urban differences in the prevalence of chronic diseases and attendant healthcare services use among older adults (≥60 years) in South Australia.

2. To examine rural-urban differences and factors associated with specialist services use by older adults in South Australia.

3. To explore the impact of co-morbid psychological distress and physical health conditions on health services use among rural older people.

4. To understand the unmet healthcare needs of older people with co-morbid mental and physical health conditions and barriers to accessing needed health services in rural South Australia.

As public health policies are being developed to improve health and well-being outcomes for Australians particularly in rural locales, a comprehensive picture of what happens among distinct demographic groups can help inform targeted strategies to drive the country's overarching public health objective to fruition. Therefore, a thorough grasp of the determinants of health services utilisation by older people in rural South Australia is desirable. This may afford policymakers with important data for a public health policy design. Again, health services may potentially be more accessible and meaningful for rural residents, thereby improving their health conditions to reduce emergency room usage as emergency episodes normally result in poor outcomes for the patient and are costly for governments to finance (Mazza et al., 2018; Vecchio et al., 2018; Vecchio & Rohde, 2017). Moreover, this data may highlight provider challenges in handling chronic health conditions in rural Australia. This could also help in the reformation of the educational modules for healthcare professionals to better understand multimorbidity and geriatric care.

Based on the research objectives, the following specific research questions were probed in the thesis:

1. Are there differences in the prevalence of chronic physical and mental health conditions and patterns of health services use between rural and urban older South Australians?
2. What factors predict specialist care services use among older people across urban and rural South Australia?
3. What is the impact of comorbid psychological distress and multimorbidity in older people on rural healthcare demand in South Australia?
4. What are the perceive unmet care needs, barriers to and facilitators of healthcare services use among rural older South Australians with chronic conditions?

1.3.3 Organisation of the Study

This research project consists of four studies using mixed data from the South Australian population health survey, i.e., data from the South Australian Monitoring and Surveillance Survey (SAMSS), and qualitative interviews of older adults (n=20) with chronic health conditions and rural-centric care providers (n=15). SAMSS is a national population-based survey that contains extensive cross-sectional data on health status (physical and mental health) and the use of health services by 20,522 respondents aged 60 years and older. The qualitative interviews were designed to provide insights

into the findings from the analysis of the SAMSS data. Overall, this research project consists of eight chapters (Figure 1.1). First, chapter 1 introduces the general concepts and overview of the research topic. Chapter 2 reviews relevant literature on the key concepts of the research topic. Research design and philosophical underpinnings are presented in chapter 3.

Chapter 4 describes a study examining the prevalence of physical and mental health conditions in older adults and their effects on health services use. This study also examines rural-urban differences in health services use. Chapter 5 describes a study on factors associated with specialist services use by older adults and highlights rural-urban disparity in the use of speciality care.

Chapter 6 presents findings from disaggregated rural data from the SAMSS survey. In this Chapter, the relationship between psychological distress, multimorbidity and health services use is discussed. The association between psychological distress, multimorbidity and available demographic variables is also presented. Chapter 7 presents a qualitative study that examines unmet care needs, barriers to and facilitators of health services use by rural older adults.

Finally, chapter 8 presents a general discussion of this research, including a discussion of the overall findings of the four studies, and places these research findings within the context of other research reports on this crucial topic.

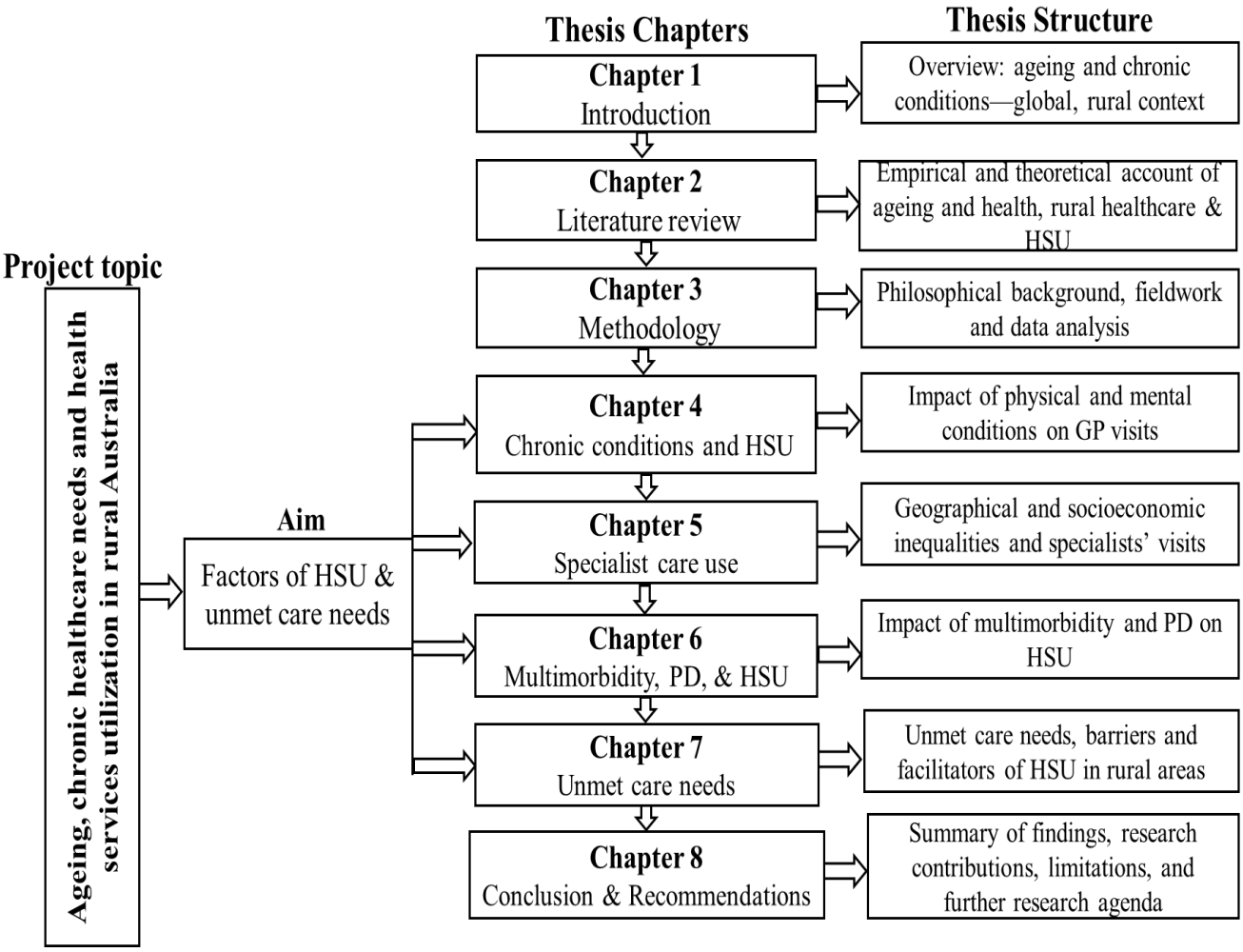

Figure 1.1 The organization of the thesis

Note: HSU = health services utilization; PD = psychological distress; GP = general practitioner

Source: Author's construct, 2023

CHAPTER

2

LITERATURE REVIEW

2.1 Introduction

Research into population ageing and rural health has gained pace in recent years, especially since the development of various healthcare reform models such as Andersen's behavioural model (Andersen, 2008) and the social determinants of health model (Wilkinson & Marmot 2003). These models aid in analysis of differentiated healthcare needs and health-seeking behaviours in public healthcare systems. The primary aim of this thesis was to extend existing knowledge regarding ageing, healthcare needs, and health services utilisation in rural environments.

This chapter reviews seminal articles as well as the most recent developments, key discoveries, and current understanding regarding ageing, healthcare access and health services use, common chronic conditions prevalent in older adults, and rural health challenges. Several published articles, books and book chapters sourced from refereed conferences and journal publications together with reports and policy documents from Australia were examined. Relevant existing studies, the research approaches employed, and other empirical issues associated with the published documents were extracted and reviewed to serve as the foundation for this thesis.

2.2 Global Trend of Population Ageing

Population ageing[3] is a widespread phenomenon whose effects are only now being fully acknowledged and recognised. With the anticipation that populations around the world would live to increasingly older ages, it is expected that increased longevity, ambitions for a higher quality of life, breakthroughs in health, and better welfare provisions will necessitate continual action (OECD, 2014; World Health Organisation, 2015). The rapid population ageing has been described as the most distinctive demographic challenge of the 21st century in various public health policymaking arenas (Naja, Makhlouf, & Chehab, 2017; Pillay & Maharaj, 2013; World Health Organisation, 2020).

Healthcare and economic implications of ageing such as higher demand for services, limited workforce especially in rural areas, and costs of complex care delivery have remained an important policy and scientific topic over the last decade. Many governments and analysts have argued that the rapid population ageing phenomenon poses a great threat to social and economic sustainability. Hence, ageing has been described with phrases such as 'the looming fiscal challenge' in Australia – p. 5 (Henry, 2004). In the US, the deputy chairman of the federal reserve bank of New York once compared the effect of ageing with that of nuclear proliferation: 'We face a threat graver and more certain than those posed by chemical weapons, nuclear proliferation, or ethnic strife: the age wave'-

[3] The rapid expansion of the older age group of a population over time (World Health Organisation, 2015).

p. 23 (Davies & James, 2016). An excerpt from the Times newspaper publication in the UK read 'most of us understand that Europe is turning grey … but if this problem has become pretty well-known, the startling size of it is sometimes forgotten. So, too, is its urgency'- p. 7 (Duncan, 2007). Ageing has received similar recognition on the international stage. The UN assembly in Vienna, Austria in 1982, recognised the implication of ageing on socioeconomic development and explored ways of making ageing a productive process rather than an economic burden. In 1994, the 'International Conference on Population and Development' held in Egypt revolved around demographic ageing and healthcare implications. The European Union designated 2012 as the 'Year of Active Ageing and Solidarity between Generations'. The World Health Organisation (WHO) prioritised ageing as its central theme for the celebration of its annual world health day in 2012. The Madrid International Plan of Action on Ageing (MIPAA) was adopted in 2002 by world leaders during the Second UN World Assembly on Ageing (World Health Organisation, 2014b). Recently, the UN Decade of Healthy Ageing (2021-2030) has emphasised the need to improve the lives of older people, their families, and the communities in which they live (World Health Organisation, 2020). These global initiatives not only prioritised healthy ageing but also aimed to explore mechanisms to tackle ageing concerns for regional and global development (Gyasi, 2018; Hirve et al., 2013; Kowal et al., 2012; World Health Organisation, 2020).

2.3 Population Ageing in Australia

Australia's population is growing much older, and this ageing is expected to continue in the coming years. Three main factors are known to drive the consistent expansion of the country's older subpopulation. First, Australia's fertility rates have dropped to an unprecedented low levels, with no sign of any increase in the future (Centre of Excellence in Population Ageing Research, 2021). Since the middle of the 1970s, the total fertility rate (TFR) has been below the level necessary to replace the older population (2.1 births on average per woman), and it has gradually, but consistently, decreased since the 1990s. As of the year 1999, the TFR stood at 1.75. The continuing decline in fertility has led to proportionately fewer births each year and an increasing number of people reaching old age (Kippen, 2002). Currently, several predictions have been made about the possible future rate of fertility in Australia. In one of its population projections, the Australian Bureau of Statistics employed 'high' and 'low' assumptions (Australian Bureau of Statistics, 2000b). The 'high' assumption total fertility rate was predicted to remain constant at 1.75. This projection, according to the Australian Bureau of Statistics, was based on the recorded fertility range of 1.9 and 1.7 babies per woman experienced since 1979. The 'low' assumption however predicted that TFR was to continue to decline and stabilise at 1.6.

Using the curve fitting method to forecast age-specific fertility rate trends, a fall in the TFR to 1.65 by 2010 and a further decline to 1.56 by 2050 is expected. McDonald and Kippen (1999) anticipated 1.65 births per woman by the end of the year 2008. According to them, this appeared justifiable given the prevailing fertility rates in other industrialised nations at the time. During this period, many advanced countries had fertility rates lower than Australia's, as well as fertility rates in Australian capital cities, which averaged around 1.65 in 1998. These presumptions cover what can be reasonably anticipated to occur regarding fertility in Australia in the long term. Each prediction was further predicated on the assumption that life expectancy would rise by an additional year every 10 years and that yearly net migration would remain constant. Migrants were assumed to exhibit fertility rates similar to those of the local population once they arrive in Australia (Kippen, 2002).

The second factor contributing to population ageing in the country is that older age-related death rates have decreased between 20 and 50% since the early 1970s, following decades of relatively stable rates. This indicates that, on average, Australian residents who survive to maturity today will live substantially longer lives than in the past (Australian Bureau of Statistics, 2022). Presently, 87% of Australians currently live past the age of 65 and can anticipate living another 18 years to the age of 83. Third, as the baby boomers are reaching retirement age, the older adult population has been increasing over the decades. Despite decades of low fertility rates, Australia's rate of population ageing has been relatively mild compared to several other countries. Australia has a high median age, with a comparatively bigger percentage older adults. In 2020, the median age in Australia was estimated at 37.9 years compared to that of other Organisation for Economic Co-operation and Development (OECD) countries such as Mexico (29.2 years), Turkey (31.5 years), and Isreal (30.5 years). However, Australia’s median age was slightly lower than that of UK (40.5 years) and the US (38.3 years) (United Nations, 2019).

Within Australia, the rate of population ageing is dissimilar across geographical locations. Younger people and international migrants tend to live in urban cities and larger regional communities than in rural and remote areas. This persistent trend means that a higher proportion of older adults are in non-urban communities than in large cities. Also, there are some specific areas, especially coastal communities, to which older people tend to move upon retirement, while the youth from such communities are attracted to city centres. This double effect has resulted in the oldest population profiles in these coastal areas (McDonald, 2017). This pattern of demographic ageing has attracted serious concerns about meeting the complex health and well-being needs of the increasing numbers of older people in rural areas due to the higher prevalence of multiple chronic conditions (multimorbidity) and healthcare access challenges in rural locales.

2.4 Determinants of Health in Ageing Populations

Socioeconomic factors are crucial determinants of health (both self-reported and evaluated health), especially in older people (Chen, Feng, & Li, 2014). Accordingly, studies that focus on socioeconomic status (SES) and health and well-being have been expanding over the years across the globe. A significant body of research shows that SES variables such us income levels, education, marital status, and employment status are consistently associated with health outcomes (Cau, Falcão, & Arnaldo, 2016; Evandrou et al., 2014; Jensen, 2004; Zimmer & Prachuabmoh, 2012). Older people with lower socioeconomic status are more likely to report poor health than those with better socioeconomic standings (Feng, Wang, & Jones, 2013; Nazroo, 2017; Evandrou et al., 2014). The reported health differentials between older people with better incomes and those with lower incomes for instance, keeps increasing. For example, older adults with higher (above the median) family income were 1.6 times more likely to rate their health as good than those whose family income was within the lowest quartile of the distribution (Feng et al., 2013). Elsewhere in Moscow, older individuals within the highest income quartile reported good health status compared to those in the lowest quartile (Jensen, 2004). Hence, economic independence and/or high economic status may offer older adults the leverage to afford healthcare which could in turn safeguard their health (Feng et al., 2013).

Marital status is one of the important determinant of health of older adults. Frequently, marriage has been highlighted as a protective factor of poor health in older age due to the potential support couples enjoy from one another (Zheng & Thomas, 2013; Robards et al., 2012). Single older individuals are more likely to report ailing health than their counterparts in marital or cohabitation relationships in the extant literature (Cau et al., 2016; Åhs & Westerling, 2006). Being married, therefore, seems to offer a buffer for adverse health, ostensibly through closer access to social support and other resources that come with marital relationships. Similarly. several studies have examined the association between health and the level of educational attainment in older populations. Higher levels of education are linked with better self-rated health (SRH) (Cau et al., 2016; Kaleta, Makowiec-Dabrowska, & Jegier, 2008; Khalaila, 2017). From the analysis by Cau et al., for example, people with basic school or no formal education had a significantly higher tendency of reporting poorer health than those with higher educational attainment (Cau et al., 2016). On the other hand, older adults who had completed higher level of education reported better health than those with lower level of educational attainment (Ardington & Gasealahwe, 2014; Bora & Saikia, 2015)

It is worthy to point that a moderate to no association between education and health exists in other studies--an indication of inconclusive observations requiring contextual and disaggregate data analyses (Liu & Zhang, 2004; Mili & Lokender, 2015; Yan, 2013). For example, Mili and Lokender

(2015) could not find a significant association between education levels and doctor diagnosed health status among rural older adults. Similarly, Liu and Zhang (2004) reported a non-linear relationship between educational attainment and self-reported health status of older people. However, those who had completed at least formal elementary education reported good health status compared to their illiterate counterparts, yet the observed difference was not statistically significant. In most instances, highly educated individuals are believed to have higher expectations of their health status than non-educated people, a possible reason for the insignificant differences reported in these studies. Yan (2013) reported a rather contradictory observation, that older persons with higher educational qualifications tended to experience poor health than less educated older individuals. It must however be emphasised that most of the participants in Yan's study had completed lower levels of education, hence the skewed sample towards lower education may have accounted for the observed insignificant association between education and health.

Employment and self-evaluated health have also been discussed previously, and employment status is believed to be linked with self-reported health in different population groups (Cau et al., 2016; Khalaila, 2017; Liu & Zhang, 2004). For example, Kaleta et al. (2008) reported that being economically inactive was associated with poor health ratings among older adults. They further revealed that unemployed men had a higher risk of poor health than their female counterparts. Cramm and Nieboer (2011) observed unemployment as a critical risk factor for poor health in South Africa. Relatedly, occupying a prestigious job position was associated with lower odds of reporting poor health in the US (Fujishiro, Xu, & Gong, 2010). On the contrary, a study has found a somewhat contradictory association between prestigious professional positions and self-rated health. Cau et al. (2016) reported that older adults engaged in petty trading had higher odds of reporting better health status than those in professional positions, especially those in government establishments in Maputo. However, this finding may still align with the reported SES-health status nexus as informal workers/traders in most developing countries tend to be more economically sound than most professionals in low-income jobs (Cau et al., 2016).

The association between socioeconomic status and health is further believed to be affected by other underlying factors including gender, age, religion, and ethnic background depending on given circumstances. A burgeoning evidence suggests that female gender is associated with poor health status (Bora & Saikia, 2015; Cau et al., 2016; Liu & Zhang, 2004; Mili & Lokender, 2015) possibly due to the biological make-up of women in part, but until recently the prolonged male bias and male norms in clinical studies. Previously, medical studies wrongly thought that females were biologically weaker and extrapolated observations from trials with male participants only to both sexes, while female biology can affect the onset and progression of the disease, and females' lower position in

society may impact their help-seeking behaviour (Pinn, 2003). Reports are also rife on the differences in self-rated health among ethnic minorities. Minority ethnic groups are more likely to rate their health as poor than the other larger ethnic groups (Australian Institute of Health and Welfare, 2022; Lim et al., 2007). Largely, there is a great deal of consistency in the existing literature on the relationship between socioeconomic indicators and self-rated health, and these results mainly highlight education, income, age, employment, and marital status as the critical socioeconomic determinants of self-rated health among older populations. In the section that follows, the influence of key socioeconomic variables on functional abilities of older people is outlined.

2.5 Socioeconomic Status and Functional Abilities

Socioeconomic status, physical abilities and other associates such as continence, eating, bathing, dressing, indoor transferring, and toileting (Activities of daily living-ADL) among older people have been widely studied (Beydoun & Popkin, 2005; Grundy & Holt, 2001; Gu & Xu, 2007; Huisman et al., 2005; Zimmer et al., 2002). Quite often, the reported association between SES and disability or functioning among older adults has been contingent on wealth (Steptoe & Zaninotto, 2020). Regardless of the established variations in the relationships existing between SES and functioning dynamics in different environments and populations around the globe, Gu and Xu (2007) argued that the precedents and directions of the associations are sometimes very similar in most aspects compared to any observable differences. Recognising the contextual realities that may affect SES and functional dynamics, the authors postulate that in every culture, those with more economic resources obtain better healthcare and ultimately experience less functional decline and disabling conditions.

In older adults, the SES effects on functional abilities may be direct or mediated by several variables such as psychosocial factors, health practices, and differential access to goods and services (Beydoun & Popkin, 2005; Grundy & Holt, 2001). Geographical location (urban/rural), age, education, gender, occupation, and living arrangement (i.e., whether living alone or with a partner) play significant role in older people's performance of daily activities including eating, toileting, continence, dressing, indoor transferring, and bathing (Barrera et al., 2017; Nilsson et al., 2011; Somrongthong et al., 2017). Older adults with higher socioeconomic status are better positioned to access requisite health services, which might be beneficial to retaining ADLs (Gu & Xu, 2007). However, the impact of socioeconomic variables on the functioning of the older population may diminish in the presence of other confounding factors such as multiple chronic conditions. Also, older individuals suffering from functional limitations may be assisted through co-residence with relatives, which can accelerate their recovery process and thus stymie the impact of the socioeconomic factors (Nilsson et al., 2011).

There seems to be a consistent narrative in the literature about the inherent potential of marriage to protect older adults against the onset of task-combined disabilities. This presume that marriage can promote the development of healthy behaviours, and as well provide family or social support which can help improve the health outcomes of couples in later lives (Gu & Xu, 2007; Waite, 1995). Despite the copious empirical evidence on the relationship between being married and health of older people, there are few contradictory observations about married older adults and the functional ability. In their analysis; Hébert, Brayne, and Spiegelhalter (1999) unexpectedly found single older adults to have good functional abilities to execute activities of daily living than those living with their partners. Among older women, living alone was significantly associated with the onset of various forms of functional disabilities but this association became insignificant in the presence of family connections, healthy behaviours, and significant others (Gu & Xu, 2007). The association between the onset of lower-risk ADL disability and living alone among older people is believed to emanate from the fact that living alone compels older individuals to undertake daily chores by themselves and thus contribute to maintaining their functional abilities. A reversal causal connection might also hold; in that healthy and non-frail older adults are more likely to live alone, enhancing their ADL function level compared to frailer older adults. Moreover, highly educated older people are more likely to be financially independent, and experience lower odds of ADL disabilities (Gu & Xu, 2007). Maintaining good functional abilities is critical to improving physical and mental health outcomes in older adult populations. The next sections discuss common physical and mental health conditions associated with ageing.

2.6 Prevalence of Chronic Physical Health Conditions in Older Adults

Gradual loss of functionality and higher incidence of chronic non-communicable morbidities such as diabetes, cancers, cardiovascular diseases (CVDs), arthritis, and hypertension are generally associated with the ageing process (United Nations General Assembly, 2011). Chronic non-communicable diseases (NCDs) (e.g., cancers, and stroke) remain the leading cause of adverse health and disability in older adults globally. This prevailing phenomenon is linked to the rapid demographic and epidemiological changes witnessed in recent decades (United Nations General Assembly, 2011; World Health Organisation, 2015; Yiengprugsawan & Kendig, 2015). Regarding this, the United Nations General Assembly Resolution (2015) has promulgated strategies aimed at reducing NCDs prevalence and associated premature mortalities in older adults (target 3.4 of the Sustainable Development Goals (SDGs) as reviewed in 2015. Approximately, 40 million lives are being claimed annually by NCDs which translates into about 70% of global annual deaths (World Health Organisation, 2014c). More than 50% of disability-adjusted life years (DALYs) are attributable to NCDs only. For instance, NCDs claimed over 38 million lives, accounting for 68% of the reported

56 million deaths worldwide in the year 2012 (Yiengprugsawan et al., 2016). It was estimated that the percentage of deaths likely to be associated with chronic diseases will increase to 75% and the highest proportion of such mortalities is expected in healthcare resource-limited environments such as rural and remote locales (Yiengprugsawan et al., 2016). Globally, the economic strain of NCDs is estimated to multiply to about AUD$ 19 trillion by 2030 from AUD$ 8.7 trillion in 2010 and economic growth is projected decline by a margin of 0.5 % given every 10% rise in chronic morbidities (Atun et al., 2013; World Health Organisation 2014c).

Contrary to the conventional notion that NCDs are more prevalent in urban areas due to the affluent lifestyle in the cities compared with non-urban areas (Wilkinson, 1994), rural and remote locales now disproportionately bear the heavy burden of chronic illnesses in most economies (Australian institute of Health and Welfare, 2022; World Health Organisation, 2015b).The association between ageing and the rising chronic conditions among rural people is believed to result from an interplay of factors including life course behavioural patterns and sustained exposure to certain risk factors (limited care resources, low income, lower levels of education) (Australian Institute of Health and Welfare, 2023; Disler, Glenister, & Wright, 2020;Centre for Disease Control and Prevention, 2012; Eldemire-Shearer et al., 2011). Demographic ageing in rural areas along with chronic multimorbidity may be an ominous threat, to which there are few avenues to respond. Ageing and the rising chronic illnesses are, without doubt, associated with increased healthcare costs (Abegunde et al., 2007; McCracken & Phillips, 2017). However, few studies have paid attention to ageing in the rural context with a focus on modifiable factors and chronic disease management to promote the well-being of older individuals in these areas.

Unhealthy behavioural patterns including alcoholism, heavy smoking, sedentary lifestyle, and inadequate intake of healthy diets (e.g., fruits and vegetables) have been linked to the upsurge of multiple chronic diseases in rural locales (Stringhini et al., 2011; Wilkinson, 1994). These lifestyle characteristics and the health risk behaviours are socially patterned in Australia. Rural residents in the country are identified with lower SES, have a higher prevalence of smoking and alcoholism, poor dieting behaviours, and engage in less physical activities (Australian Institute of Health and Welfare, 2023). Older adults in rural and remote Australia, compared to their urban counterparts, tend to use more alcohol and tobacco but eat a relatively less balanced diet (Australian Institute of Health and Welfare, 2022), Even though, the association between socioeconomic status and unhealthy lifestyles keeps changing over time (Stringhini & Bovet, 2017), older people from lower socioeconomic backgrounds have higher odds of experiencing chronic illnesses (Stringhini & Bovet, 2017; Stringhini et al., 2011). These phenomena make it more expedient to promote preventive health strategies across regional and remote locales, especially in lower SES populations. Importantly, responsive

mechanisms to reduce the impacts of NCDs in older adults remain critical in public health systems (McDonald et al., 2009; Mitchell-Fearon et al., 2014; Stringhini & Bovet, 2017).

Considering the increasing rate of chronic physical and mental health conditions and the associated functional limitations especially among the older population, the need for increased access to and use of required health services to manage these chronic conditions, particularly in rural health systems is critical for improved health outcomes for the growing older populations.

2.7 Mental Health Problems in Older Adults

Mental health may decline as people age because of psychosocial pressures, losses, increased frailty, and physical sicknesses experienced during the ageing process (Kiely, Brady, & Byles, 2019). A burgeoning clinical and research interest has focused on the association between physical and mental health over the past decades. Several cross-sectional and longitudinal studies have shown that poor physical health is consistently associated with mental health conditions or terminal decline[4] in older individuals (Kiely et al., 2019; Luo, Chui, & Li, 2020; Ohrnberger et al., 2017). Largely, good physical health has been related to good or exceptional levels of mental health-related quality of life and vice versa (Leigh et al., 2016). Commonly reported mental health challenges that usually coexist with physical sicknesses in older adults includes psychological distress, depression, and anxiety. In a recent Australian national health survey, about 68% of older Australians experienced low levels of psychological distress within the previous month to the survey (Australian Institute of Health and Welfare, 2023). In the same survey, 19% of older people reported moderate psychological distress while another 10% had experienced very high distress within the same period. Older people with mental health challenges are more likely to experience higher disability and reduced health-related quality of life (Porensky et al., 2009). Furthermore, older individuals with depression, for instance, are known to have higher tendency to experience frailty (Soysal et al., 2017). Depression coexisting with complex chronic diseases has been predicted to be the second-leading cause of global disease burden as populations age (Moussavi et al., 2007).

2.7.1 Depression

Depression is one of the common mental health conditions in older people, but its reported prevalence in older adults varies across studies due to cultural diversities and differences in screening tools (Agustini et al., 2022; Curran et al., 2020; Hu et al., 2022). A prevalence rate ranging from 1% to

[4] The rapid start of psychological morbidity towards the end of life in people with generally stable mental health throughout life (Gerstorf et al., 2010).

49% has been recorded in this subpopulation in systematic reviews of research articles extracted from different parts of the world (Agustini et al., 2022; Zenebe, Akele, & Necho, 2021;Djernes, 2006). Consistent with global reports, Australian studies have documented between 1% to 44% as depression prevalence rates in the country's older populations in the past decades (Brodaty et al., 2001; Henderson et al., 1993; Snowdon et al., 1996; Snowdon & Lane, 1995; Wilhelm et al., 2003). The huge disparities in the prevalence estimates are largely due to methodological factors. First, how depression was defined in the studies examined was highly variable. Surveys looking at significant, moderate or severe depression, as opposed to those looking at dysthymia or minor depression, produced lower prevalence rates. However, even when the same level of severity was taken into account, surveys that used validated assessment criteria, such as the DSMIV-TR (American Psychiatric Association, 1994) or ICD10 (World Health Organisation, 2005), tended to produce lower prevalence estimates than those that evaluated depression using alternative criteria, such as the GMS-AGECAT (Copeland et al., 1986), or determined depressive symptoms using depression scales (Djernes, 2006).

Second, the disparity in Djernes (2006) findings, for example, may have been due to the sampling techniques employed by the various prevalence studies. Studies that sampled older adults from private households typically produced lower estimates than those that drew their sample from institutionalised settings (e.g., nursing homes). Third, the reliability of the provided prevalence estimates may have been impacted by different sample sizes. Most reviews included papers with sample sizes ranging from several thousand to less than 100. Studies with smaller sample sizes might have generated less accurate estimates and, in some cases, added outliers to the range presented.

Many scholars have employed various techniques to examine the discrepancies in depression prevalence in older populations. One of the notable reviews pooled prevalence data from 34 studies and weighted them according to sample size (Beekman et al., 1999). The study reported prevalence estimates of 1.8% for major depression, 9.8% for minor depression, and 13.5% for all depressive symptoms. A key limitation of Beekman and colleagues' study was that their analytical approach did not account for methodological variations between studies (such as various instruments). Subsequently, a collaborative effort of some researchers resulted in the formation of the EURODEP Concerted Action Program to harmonised depressed symptom scale (Portellano-Ortiz et al., 2018). Using a pooled sample of 22,570 persons aged 65 and above, EURODEP estimated an overall prevalence of depression of 12.3%. Age-adjusted and gender differences in the prevalence of 12-month depression symptoms have been recorded in older populations of Australia. An estimated rate

ranging from 1.2- 8.6% for men and 7.9% for women is documented (Zenebe et al., 2021;Pirkis et al., 2009; Wilhelm et al., 2003; Trollor et al., 2007).

The interest in depression estimates in older adults has been consistent and seems unending among researchers. A recent systematic review and meta-analysis attempted to evaluate the global prevalence of depression in older adults. Using published data between the years 2000 and 2021 from different databases, the study estimated depression prevalence in older adults to be 28.4% (Hu et al., 2022).

2.7.2 Anxiety Disorders

Anxiety disorders involve persistent and excessive worry that affects daily activities. These conditions affect approximately 30% of adults at some point in their lives. Anxiety disorders are very common among older populations especially in high-income countries (Creighton et al., 2016; Lee et al., 2023). Studies indicate that generalised anxiety disorder (GAD) is the most prevalent anxiety disorder and that it affects older persons just as frequently as it affects younger adults, if not more frequently. It must be emphasised that estimates of the prevalence of anxiety disorders in older people have been found to vary greatly across epidemiologic studies (Lenze & Wetherell, 2022). The prevalence estimates of any past-year anxiety condition in older adults across studies ranges from 0.1% to 15% among community-dwelling older adults (Bryant et al., 2008; Creighton et al., 2016). Most of the studies found women to have higher rates of anxiety and more than one-fifth of the incidence of anxiety was coexisting with depression. In the Australian context, an analysis of a population-based sample of community-dwelling older people showed a weighted 12-month prevalence of GAD to be 2.8% (Gonçalves et al., 2011). Further, studies have reported on anxiety in individuals living with dementia both in the outpatient community and in the nursing home. These reports show that the prevalence of anxiety symptoms was 16.6% in the outpatient community (Brodaty et al., 2015) and 4.7%-19.4% in the nursing home residents (Amare et al., 2020; Hillen, Vitry, & Caughey, 2017).

Specific prevalence estimates from selected developed countries that demonstrate similar healthcare systems and ageing profile to that of Australia are worth highlighting. A range from 3.2% to 14.2% of late-age anxiety disorders has been reported in a U.S. sample (Forsell & Winblad, 1997;Ritchie et al., 2004; Gum et al., 2009). A 6-month prevalence of any anxiety problems was 10.2%, according to data from the ‘Longitudinal Aging Study Amsterdam’ (LASA). However, this study's definition of ‘older adult’ as people 55 and older highlights difficulties in integrating findings from research that employ several operational definitions. Earlier documented rates in Canada ranged from 0.82%- 1.5% for people 55 years and over (Corna et al., 2007; Cairney et al., 2007;McCabe et al., 2006). These

estimates have been criticised by some researchers because the diagnostic standards and measurement tools applied in earlier analysis had not been validated for use in older populations. Subsequent studies have shown that 19–20% of community-dwelling older Canadians have clinically significant levels of anxiety symptoms (Mehta et al., 2003;Seitz et al., 2010). However, survey data that is restricted to community-dwelling older adults may understates overall prevalence rates.

High levels of anxiety symptoms have been linked to functional disability, loneliness, lower life satisfaction, and poor self-rated health (de Oliveira et al., 2023; Li & Miller, 2017). Even worse, older adults with generalised anxiety disorders experience poor physical health (Wetherell et al., 2004). Moreover, anxiety disorders are highly comorbid with many medical conditions that in concert result in rapid cognitive decline (Bandelow & Michaelis, 2022; Wolitzky-Taylor et al., 2010). There is evidence that anxiety problems are associated with higher mortality rates in older males (Van Hout et al., 2004). Research not specific to older people has also demonstrated that anxiety is related to many psychosocial impairments and quality of life dimensions (Mendlowicz & Stein, 2000), as well as an elevated risk of suicidal ideation and suicide attempts (Sareen et al., 2005).

2.7.3 Suicide Behaviours

Older people have been identified to have the highest rate of suicide deaths in the world (World Health Organisation, 2014b). The rate of suicide behaviours among older people has increased over the past three decades in most industrialised nations, with a notable rise in both attempted suicides and suicide deaths in the late 1980s (Crocker et al., 2006; Mergl et al., 2015). Research has shown that suicide prevalence is higher in older men than women. Psychiatric disorders, depressive symptoms, hopelessness, and previous suicide attempts are some risk factors for suicide ideation in all age groups (Kumar, Anish, & George, 2015). However, older adults experience unique age-related difficulties such as worsening physical and mental health, pain, cognitive deficiencies, and decreased social connectivity (Fässberg et al., 2016;Costanza et al., 2020). For example, one large-scale Australian study suggested that somatic factors such as pain and a negative perception of one's health as well as psychiatric problems like depression, anxiety, and prior suicide attempts all predicted suicidal ideation in older adults (Almeida et al., 2012). There is a growing concern that the burden of suicide ideation among older people is being underreported because older individuals are less likely to admit emotional distress (Van Orden & Conwell, 2016).

The Australian Bureau of Statistics (2011) has reported that 1635 Australians, 65 and older, died by suicide between 2007 and 2011. However, from July 2001 to December 2011, 3646 suicide fatalities in the same age group were recorded by an Australian coroner (Saar, Bugeja, & Ranson, 2017). Also,

analysis of hospital records has indicated 4.6% suicide attempts and 15% of completed suicides among older people in Western Australia (Lawrence, 2000). Specific gender rates stood at 3.3 times more in males and 4.4 times more in females relative to the prevalence estimate in the general older adult population. Subsequently, another Western Australian study reported that 5.8% of 1061 older people (60+ years) who accessed GP services acknowledged suicide ideation (Pfaff & Almeida, 2005). Although suicide prevalence in older Australians has decreased over the past century (Goldney & Harrison, 1998), the ratio of males who commit suicide in their later years is still higher than that of their younger counterparts (24.4 versus 20.3 per 100 000 in the age ranges of 75 and 15–24 years, respectively) (Australian Bureau of Statistics, 2003b).

Different rates of suicide ideation and suicide attempts among older adults have been reported across cultures that has similar ageing profile as Australia. In a cross-sectional study of Japanese older adults who receive public welfare assistance vs non-recipients, 4.8% of the welfare recipient respondents reported suicide ideation and 2.2% had attempted suicide. In the adjusted model (controlling the effects of demographic variables and health conditions), the public welfare beneficiaries had about 1.5 times higher prevalence of lifetime suicide ideation and approximately two times higher prevalence of attempted suicide (Kino et al., 2022), suggesting a socioeconomic association with suicidality in older adults. The prevalence estimates in older Japanese adults are relatively high relative to earlier estimates of 0.7% to 1.2% among older primary care patients (Callahan et al., 1996). Available statistics indicate that 7215 Americans aged 65 and over committed suicide in 2013, accounting for 17.5% of all suicide deaths nationwide (Drapeau & McIntosh, 2016).

2.7.4 Psychological Distress

There is now a well-established evidence base demonstrating the effects of psychological distress on mental health and quality of life of older people (Vink et al., 2009). Stressful life events like bereavement and other traumatic experiences are the major causes of distress as people grow older. In addition to these psychosocial stressors, distress in later life may also be attributed to increased loneliness, social isolation, complex morbidities, and financial stress (Korda et al., 2014); Almeida et al., 2011; Li et al., 2022). About 11.1% of adult Australians are found to suffer from severe distress. However, there are marked difference in prevalence of psychological distress in Aboriginal and non-Aboriginal older Australians (Enticott et al., 2018). High distress affected 43.8% of Aboriginal and 20.9% of non-Aboriginal participants in a study (McNamara et al., 2018).

The higher prevalence of distress in Aboriginal populations is attributable to disparities in the prevalence of risk factors common to all Australians. The sociodemographic, health , and lifestyle

risk factors related to psychological distress are known to be largely similar between Aboriginal and non-Aboriginal people (Cunningham & Paradies, 2012; McNamara et al., 2018). Further, it has been demonstrated that geographical remoteness is associated with elevated distress in Australia, particularly in Aboriginal communities. Prevalence of psychological distress was shown to increase with remoteness of residence (McNamara et al., 2018). Again, association between psychological distress and certain demographic variables has been investigated in Australia and other parts of the world (Byles et al., 2012; Enticott et al., 2018; Sunderland et al., 2015). Together, these researchers highlight a range of demographic variables including age, female gender, education, employment, and income that are associated with psychological distress. However, much of the associated research is considered preliminary and methodologically limited, and therefore do not offer definitive conclusions (Henning-Smith, 2016; Sunderland et al., 2015; Xiao et al., 2022).

2.8 Mental Health Service Utilisation Among Older Adults.

Despite the high prevalence of mental health challenges in older populations, older adults have long been found in the mental health literature to underutilise mental care services (Bartholomaeus et al., 2023; Cairney et al., 2010; Crabb & Hunsley, 2006, 2011; Henderson et al., 2014; Henderson et al., 2018). For example, VandenBos, Stapp, and Kilburg (1981) found that only 2.7%-4% of older adults with a potential need for mental health care received services rendered by mental health professionals. Examining differences in mental health service uptake between younger people and older adults, German, Shapiro, and Skinner (1985) used data from the Epidemiological Catchment Area (ECA) Program conducted in the early 1980s to show that only 4.2% of those 65-74 years and 1.4% of those aged 75 or older consulted any mental health professional, compared to 8.7% of relatively younger adults (18-64 years).

Older adults with anxiety issues are probably the most underrepresented in the mental health care system, especially considering the persistent evidence that those who experience anxiety disorders underutilise mental health services (Bandelow & Michaelis, 2022; Sartorius et al., 1996; Neighbors et al., 2008). According to a WHO study, just about 50% of cases of anxiety disorders are recognised, and only about 33% of affected patients seek professional help (Sartorius et al., 1996). The underutilisation of appropriate care for anxiety disorders in older patients has been linked to many factors. The commonly reported ones are stigmatisation, navigating the complex health system, lower SES, awareness of services, and lower perceived need for care services (Bandelow & Michaelis, 2022; Bretherton, 2022; Byers et al., 2012). The underutilisation of professional care services for

anxiety and other mental health disorders has been linked to increased rate of suicide behaviours in older people, particularly in rural areas (National Rural Health Alliance, 2017).

Suicide ideation and service use by older people has continued to attract research attention. Patterns of health services among community-dwelling older adults with suicide behaviours vary across the literature. While many investigations have suggested that older people with suicide behaviours do not access needed health services (Corna et al., 2010), emerging evidence has indicated that ideators make frequent visits to their primary care providers (O'Riley et al., 2014; Vasiliadis et al., 2013; Vasiliadis et al., 2023;Yip et al., 2003). Of note, one study found that suicide ideation was significantly associated with an increased frequency of seeing a physician, however, this observation could not reach statistical significance in models adjusting for other mental health problems and sociodemographic variables (Yip et al., 2003). In a case-control study of older people with suicide mortalities, a chart audit showed that older individuals who had committed suicide were twice as likely to have seen a doctor the week of their passing than the controls and about 70% saw a doctor a month prior to their death (Juurlink et al., 2004). Even when older people in need of mental care used a service, it was unlikely to be an appropriate one and lacked consistency, or optimum duration to effectively treat the psychiatric symptoms (Bartholomaeus et al., 2023; Stanley, Hom, & Joiner, 2015). Further, other studies examining mental health service utilisation among samples of community-dwelling older people who meet the criteria for the mental disorder have suggested that less than 50% sought specialised mental care service during the same period (Bandelow & Michaelis, 2022; Byers et al., 2012).

The low rate of mental health service use among older cohorts has been an enduring phenomenon, attracting sustained policy and research interest. Recently, researchers have focused more attention on factors associated with the lower use of mental services in the ageing population(Bartholomaeus et al., 2023). Barriers such as belief systems, lower education, and unavailability of services particularly in rural areas have been associated with underuse of mental health services (Bartholomaeus et al., 2023; Crabb & Hunsley, 2006; Volkert et al., 2018). The severity of mental symptoms such as depressive symptoms, good self-rated health and positive attitude towards mental health services were strongly associated with service use among older American Indians (Moon et al., 2018). Personal characteristics (beliefs, gender), enabling variables (insurance status, education, social support, income), and need variables (severity of symptoms, health status) were the key predictors of older adults' mental health service use (Karlin et al., 2008).

Several barriers including inadequate geriatric mental health professionals and financial problems have been associated with the low rate of mental service use among the ageing population. In a sample

of Hispanic older adults, mental care access and use are affected by issues related to services availability, perception of need, and acceptability of available care (Guzman et al., 2015). For instance, older people may recognise symptoms of mental disorders, but they are less likely than younger adults to perceive a need for outpatient services. Some older adults see depressive symptoms as a normal part of ageing (Crabb & Hunsley, 2006). Again, older people's mental health services uptake has been linked with stigma, knowledge about mental health, transportation, physician referrals, costs of service (Pepin, Segal, & Coolidge, 2009).

There may be both patient and practitioner-related hindrances to receiving specialised mental care in later life. It has been suggested that primary care physicians reluctantly refer community-dwelling older persons with depressive symptoms for speciality mental health treatments. Also, there are limited mental health specialists practicing in rural and remote Australia (National Rural Health Alliance, 2021; Qualls et al., 2002). Therefore, receiving care almost exclusively from general medical practitioners, older adults may be missing out on the chance to benefit from psychosocial therapies such as cognitive behavioural therapy, that are effective in treating mental health challenges (Areán & Cook, 2002). These types of services are more likely to be available in the speciality care field. Even though many of the treatments for late-life depression have been found to fall short of clinical practice recommendations in both specialty mental health and general medical settings (Henning-Smith et al., 2023), specialty mental health providers are better informed about the available treatments and are therefore more likely to offer patients with depression in late-life the right care. The underutilisation of mental health services among older populations is even worse in rural environments (National Rural Health Alliance, 2017).

The underutilisation of specialist mental health services among older people is concerning for many reasons. First, the prevalence of comorbidity of mental health problems such as depression and anxiety has been consistently high in this population cohort (Australian Institute of Health and Welfare, 2000; Jong et al., 2005; Lau & Morse, 2008) and management of complex multimorbidity requires various medical speciality services. Second, evidence of effective treatment of older adults with mental health problems (e.g., psychological distress, depression, and anxiety that are usually comorbid with physical health conditions in older adults) suggests that many older people who are not accessing services could be experiencing noticeable improvement with treatment (Hendriks et al., 2008). Third, the number of older individuals in the general population continues to grow, with a sizable proportion living in rural and remote areas. In fact, in Australia, the percentage of the population over 60 years is expected to rise from the current 16.5% to 23% by 2066 (Australian Bureau of Statistics, 2018; Australian Institute of Health and Welfare, 2021). This projected increase implies the number of older people needing speciality services will also increase. Jeste et al. (1999)

have also projected a disproportionate rise in older adults with multiple physical and mental health conditions across the world as the boomers (persons born between 1946 and 1964) reach old age. They argue that improvements in the overall standard of living and medical advancements will lead to greater longevity for those with chronic conditions. They also indicated that the baby boomer generation is expected to be more prone to chronicity compared with the current cohort.

2.9 Multimorbidity in Older Adults

In epidemiological studies, two concepts have been used to describe the extent of disease burden in an individual: comorbidity and multimorbidity. Comorbidity is the existence of any distinct additional health condition to an index medical condition (Barnett et al., 2012; Huntley et al., 2012), while multimorbidity is denoted by the co-occurrence of multiple medical conditions when none of the conditions is identified as an index condition (Kennedy et al., 2014). Thus, the presence of two or more diseases in an individual, with the examination of each contributing ailment based on established criteria (Fried et al., 2004). Multimorbidity is seen as a patient-centred concept, and a better indication of disease burden (Ofori-Asenso et al., 2019). It is anticipated that the rate of multimorbidity will be proportional to population ageing with a more than 1% rise per annum until 2030 (Yoon et al., 2014).

There is ample evidence in support of the association between ageing and increasing multimorbidity (Lu, 2023; Pedone et al., 2023; Suzman et al., 2015). Older people have a higher risk of multimorbidity, which brings about significant challenges for clinicians as the practice guidelines for single ailments may not be applicable in multimorbid settings (Ofori-Asenso et al., 2019). The high rates of multimorbidity in older individuals could be attributed to the frequency of distinct chronic conditions that increase with age. About 48% of community-dwelling Americans aged 65 and older had two or more coexistence of chronic conditions (Fried et al., 2004;Ofori-Asenso et al., 2019). The prevalence of multimorbidity among older adults (60 years or older) in high-income countries has been estimated to be 66.1% (Ofori-Asenso et al., 2019). The study found a stronger association between increasing age and a higher burden of multiple health conditions. Salive (2013) used population-based administrative data to study multimorbidity in older adults. The rate of multimorbidity in this sample was found to be 67% overall, and advancing age was associated with higher prevalence.

The reported estimates of multimorbidity prevalence vary across cultures and population groups. Gontijo et al. (2019) used population health data and a systematic review approach in a single study to examine multimorbidity prevalence among older adults in a primary care setting. They reported a

very high estimate up to 95.9% in their study population. The authors argued that using a single approach to measure multimorbidity prevalence in older individuals may lead to a possible underestimation. Available data suggest that multimorbidity is proportionately higher among rural older adults than in urban areas. About 69.4% of rural older people who participated in a Health and Ageing study were found to have multimorbid conditions (Chang et al., 2019). The most common combination of disease groups and multimorbid profiles were depression and cardiometabolic conditions. Surprisingly, the frequently reported positive association between ageing and a higher burden of multimorbidity was not observed in this study (Chang et al., 2019). One of the possible reasons that accounted for this observation was that the authors included relatively younger adults (40 years or above) in their study. Also, the subgroups had different epidemiological profiles, with higher prevalence of HIV and anaemia in the poorer and younger groups, and higher prevalence of cardiometabolic conditions in the richer and older group.

Multimorbidity has been linked to poorer functional capacity and quality of life, higher likelihood of hospitalisations, and worse health outcomes. It has also been linked to higher service use and healthcare expenditure (Glynn et al., 2011; Picco et al., 2016). Thus, the occurrence of multimorbidity has significant effects on individuals, healthcare systems, and economies at the global level. Studies have shown that diseases, comorbid conditions, and frailty, acting independently or, in synergistic configurations are risk factors for physical disability. Hence, multimorbidity is a risk factor for rapid functional decline and disabilities in older people.

2.10 Disability

The World Health Organisation defines disability as physical and mental impairment in relation to an individual's body structures and functions, participation in activities, and interaction with the person's health conditions (World Health Organisation, 2011). The Australian Bureau of Statistics survey of Disability, Ageing and Carers (SDAC), considers an individual to have a disability if the person experiences 'at least one of a list of limitations, restrictions or impairments, which has lasted or is likely to last, for at least six months and restrict everyday activities' (Australian Bureau of Statistics, 2003a; Australian Institute of Health and Welfare, 2022a). The limitations are categorised into ten activities related to daily living including mobility, communication, self-care, healthcare, cognitive or emotional tasks, transport, household chores, property maintenance, writing or reading tasks, and meal preparation (Australian institute of Health and Welfare, 2018). Chronic ailments such as arthritis, dementia, diabetes, respiratory disorders and certain hearing and vision impairments are especially common disabling chronic conditions in older adults (Chowdhury et al., 2023; Mangin et al., 2023). The World Health Organisation's figures indicate that about a billion people are living

with various forms of chronic disabling health conditions around the globe (World Health Organisation, 2014a). The Australian Bureau of Statistics reported that 4.2 million people live with chronic health-related functional disabilities across Australia (Australian Bureau of Statistics, 2015a).

Older people are highly vulnerable to chronic disabling morbidities (Chowdhury et al., 2023; Mangin et al., 2023). Chronic diseases often coexist with some form of disability. More than half of Australian older people with at least one selected chronic health condition also have disability (Australian Bureau of Statistics, 2019). Apart from the perception of 'difficulty' around which most definitions of disability revolve, the concept has been applied in certain instances as the need for assistance from another person in carrying out crucial tasks. Fried et al. (2004) argue that this operationalisation of disability is particularly apt for about 5% of older persons (65 years and older) in nursing homes. Mainly, diseases and physiological alterations that are naturally concomitant with ageing, together with other factors (economic, behavioural and social) are the known leading cause of many physical disabilities (Abe et al., 2023; Gowan & Roller, 2022). Also, studies have shown that comorbid conditions and frailty acting independently or, in synergistic configurations are risk factors for physical disability (Chowdhury et al., 2023; Mangin et al., 2023).

2.11 Common Chronic Health Conditions Among Older Australians

In older populations, health can be evaluated in various dimensions including quality of life, mortality rates, functional disabilities, and life expectancy. Common chronic disease groups affecting Australians aged 60 years and over are malignant neoplasms (cancers), respiratory diseases, cardiovascular diseases, neuropsychiatric disorders, musculoskeletal conditions, and sense organ diseases (O'Loughlin, Browning, & Kendig, 2017). Cancer prevalence in Australia is rising, particularly in the older population. Breast cancer and prostate cancer are the most prevalent malignant cancers in Australian women and men, respectively, and the prevalence of these cancers increases with ageing. In 2015, a man in Australia had a one in three (36%) probability of developing cancer by the age of 75 and a one in two (54%) chance by the age of 85. The corresponding risks for women were one in four (27%) by age 75 and one in three (39%) by age 85. (Australian Institute of Health and Welfare 2015). In both men and women, smoking has been identified as the biggest risk factor of cancers. Due to the recent increasing prevalence of smoking in women, their risk of having cancer is gradually rising to that of men (O'Loughlin et al., 2017). Apart from cancers, smoking is also linked to heart disease.

The most prevalent form of heart disease affecting older Australians is coronary heart disease, which is more prevalent in smokers, overweight persons, and people with high blood cholesterol (Australian Institute of Health and Welfare, 2014a). Men and women are both affected by coronary heart disease, albeit women are more likely to get it later in life. Case-fatality rates of acute myocardial infarction (heart attack) have decreased over the past few decades because of improved emergency care. However, heart failure and angina remain significant health issues for many older adults (O'Loughlin et al., 2017). Again, around 3-4% of men and women in Australia who are 75 years of age or older have experienced a form of stroke, which is a substantial disability caused by cerebrovascular illness. Stroke typically results in death, and survivors frequently experience long-term severe or catastrophic disability (Australian Institute of Health and Welfare, 2007). A study has indicated that around 38% of women who survived the immediate effects of stroke episode went on to live for at least another 12 years, many of whom had a significant health disabling conditions including dementia during this time. (Byles et al., 2015)

Dementia is the most prevalent and significant neuropsychiatric illness affecting older Australians and it is believed to be the highest cause of disease burden in those 75 years of age and older (Australian Institute of Health and Welfare, 2012a). According to the Australian Institute of Health and Welfare (2012c), 298,000 individuals in Australia had dementia in 2011; 33% of those affected were aged 75 to 84 and 41% were 85 years or older. The prevalence of dementia among those over 85 years was 30%. It has been projected that by 2050, there will be three times as many people with dementia (Australian Institute of Health and Welfare, 2022). Overall, women experience dementia more frequently than males in the country. There are numerous reports about risk factors of dementia (Anstey et al., 2007; Launer et al., 1999), and many of the risk factors are also related to stroke and cardiovascular disease (Tolppanen et al., 2012).

Common respiratory conditions in older Australians include asthma and chronic obstructive pulmonary disease (COPD). Smoking is the main risk factor for COPD, however other environmental and occupational factors can make people more susceptible to this condition. In 2004–2005, asthma affected 9.4% of people aged 70 and older, and the average age of death from asthma was 79. (Australian Institute of Health and Welfare, 2010a). Current statistics indicate that asthma is more prevalent among females (10.8%) than males (7.4%), but the gender difference diminishes with advanced age. Asthma is, however, highly prevalent in older indigenous populations (19.4%) than in non-Indigenous older people (9.1%) (Australian Institute of Health and Welfare, 2023).

Conditions that affect sense organs include vision and hearing impairments. Australians aged 65 or older had a 94% prevalence of vision impairment in 2007–2008 (Australian Institute of Health and

Welfare, 2012a). Australians aged 80 years and above have higher risk of suffering from cataract, glaucoma, and macular degeneration. (Australian Institute of Health and Welfare, 2007). Hearing loss is also high among older Australians. The reported rate of hearing loss in people aged 70 years and above was 75% in Australia in 2012 (Kiely et al., 2012). In this study, audiometric hearing loss was present in 89% of males and 87% of females over the age of 85. Age-related hearing loss has been associated with lower quality of life (Hogan et al., 2009), worse mental health (Gopinath et al., 2009), cognitive decline (Tay et al., 2006), decreased social engagement (Kiely et al., 2012), and increased use of community services (Schneider et al. 2010).

Arthritis, falls, and other injuries are examples of musculoskeletal issues. One of the most prevalent reasons for activity restriction and disability among older Australians is arthritis. In the 2014–2015 National Health Survey, 35.2% of men and 51.4% of women who were 55 years or older reported having arthritis (Australian Bureau of Statistics, 2015b). Approximately, every 1 in 3 Australians experiencing arthritis also report functional decline relative to their daily activities (Australian Institute of Health and Welfare, 2010c). Every year, about 16% of older adults 60 years or older and roughly one-third of those 65 years and above report falls; with more than 30% of these older individuals sustaining injuries (such as hip or pelvic fracture and/or head injury) that require medical treatment (Morris et al., 2004). There were 2,663 falls that led to hospitalisation among people over 65 in 2009–2010 (Bradley, 2013). According to the Australian Institute of Health and Welfare (2012a), 72% of all hospitalised injury cases for people 65 and over in the country between 2009–2010 were caused by falls. An estimated $648.2 million was spent on acute care for older patients who fell in the years 2007–2008. (Bradley, 2012). For older adults in residential aged care and acute care settings, the rate of falls and related injuries is even higher (Gibson et al., 2008). In one research in aged care facilities, there were 171 falls for every 1,000 bed-months of surveillance.

2.12 Rural and Remote Health

The concepts of rurality and remoteness are sometimes used interchangeably. However, the two can be distinguished based on proximity to metropolitan towns and population density. It has been argued that not all remote establishments are rural. Ford (2016) employed population density and the socio-economic activities of communities to differentiate between the two concepts. To him, rural communities are predominantly small-scale agrarian producers intimately tied to the broader economy of a country while remote inhabitants are mostly into subsistence trapping and hunting with a relatively smaller degree of economic ties to the broader economy of a polity. Goodridge and Marciniuk (2016) identified transportation network, population distribution and geographical size of a geographical area as some of the factors for rural or remote taxonomy. For instance, the Canadian

Statistical department classifies rural settings as communities outside of major metropolitan areas with a population of less than 10,000 people. The department further categorised non-urban areas into rural and remote towns by their proximity to main urban locations (Bélanger et al., 2005).

There have been a few geographical classification systems of urban, rural, and remote designations in Australia. The Rural, Remote and Metropolitan Areas (RRMA) and Accessibility/Remoteness Index of Australia (ARIA) adopted road distance to main service centres and population density for geographical classifications (Australian Institute of Health and Welfare, 2004b). The Australian Standard Geographical Classification-Remoteness Areas (ASGC-RA) refined ARIA's model of classification by differentiating between accessibility levels of services and locations. ASGC-RA's framework suggested five designations, that is major cities, inner regional, outer regional, remote and very remote (Willis et al., 2012). However, ASGC-RA does not explicitly account for road distance and population of towns and communities. By accounting for these key factors, a new model of classification known as the Modified Monash Model (MMM) has evolved. Based on ASGC-RA, the MMM established seven distinct geographical classifications, distinguishing between different communities in inner and outer regional Australia (Willis et al., 2012; p.141). Unlike the ASGS-RA, the MM Model does not exhibit a continuum of the largest population in most accessible classification to the smallest population in very remote location (Versace et al., 2021). Even though none of the geographical classification models is considered infallible, the MMM (Table 2.1) is noted to have a superior performance in terms of planning and health service policy decisions (Versace et al., 2021).

Table 2.1 Modified Monash Model and ASGC-RA geographical categorization systems.

MMM's Seven Geographical Taxonomy	ASGC-RA's Five Classifications	Population Criteria	Sampled Location
1	RA 1 [Major cities]	All	Most capital cities
2	RA 2 & 3 [Inner regional & Outer regional]	>50000	Bendigo, Launceston
3	RA 2 & 3 [Inner regional & Outer regional]	15000-50000	Coffs Harbour, Mt Gambier, Shepparton
4	RA 2&3 [Inner regional & Outer regional]	5000-15000	Moree, Warwick, Port Augusta
5	RA 2&3 [Inner regional & Outer regional]	0-5000	Margaret River, Gundagai, Bega
6	RA 4 [Remote areas]	0-5000	Bourke, Queenstown
7	RA 5 [Very remote]	0-5000	Derby, Tennant Creek, Weipa

Source: Adapted from Department of Health -Rural & Regional Australia (2015)

Rural or remote health has been operationalised differently by various academics due to a lack of a universally accepted definition. However, as indicated by Tham et al. (2014), definitions and classifications are essential in healthcare systems for health service planning, policy-making and allocation of human and financial resources to rural and urban locations. Willis et al. (2012) described the term rural health as 'the health status of individuals and communities in regional and remote areas' (p.141).Rural health involves the normative values and social relationships that impact health care, that is the behavioural patterns that have been accepted to either promote or have adverse outcomes on health, which ultimately informs the approach to health service delivery in local communities (Bourke et al., 2012). Rural communities are noted for closer social bonding and collective approach to problem-solving and self-reliance. In this regard, health service providers in rural communities tend to collaborate and resort to generalist and extended roles to optimise scarce resources (Bourke et al., 2012; Henderson et al., 2018; Farmer et al., 2012). Henry et al. (2009) have argued that these collaborations manifest rather informally, and sometimes health professionals often assume community leadership roles in other community services.

2.13 Rural and Healthcare Challenges

There is mounting evidence across the literature that rural residents experience significant barriers to accessing health services (Brundisini et al., 2013; Ford, 2016; Geyman & Hart, 1993;Gibson & O'Connor, 2010; Goins et al., 2005; Green-Hernandez, 2006; Ward & Tham, 2019), despite the fact that rural residents report higher complex chronic ailments than urban populations (Australian Institute of Health and Welfare, 2023). Specifically, rural people experience disproportionate access to healthcare facilities and a persistent shortfall of hospital staff. Moreover, insufficient training and evaluation accoutrements, transportation, low-income levels, and distances between local and referral facilities compound the woes of rural dwellers in accessing health care (MacKinnon et al., 2023).

Rural and remote locales in many countries experience higher rate of population ageing than urban areas and subsequently, have a greater share of older people. The sad reality is that, despite the unique conditions rural older people face which in most instances require specialised care, they remain one of the most under-served group (Parsons et al., 2021). Most rural populations have limited access to preventive, curative, or rehabilitative services. These challenges exacerbate for persons living with chronic conditions (Brundisini et al., 2013). There is a need for primary healthcare to contain chronic conditions by preventing them from deteriorating. Inadequate primary health services potentially defer access to needed medical services until a crisis occurs. It is believed that adequate levels of primary care can reduce the use of intensive care units and costly health services (Mullan et al., 2023).

Extant empirical studies on complex chronic conditions constantly point to serious disregard for the complex clinical and social needs of rural residents. It has been discovered that non-institutionalised individuals living with chronic conditions in remote areas suffer from inadequate access to several services that are available in metropolitan areas (Brundisini et al., 2013). A more worrying situation is the level of awareness and health-seeking behaviour among rural residents. Omohundro et al. (1983) noted that while few seek or obtain professional help, a larger section of the rural community is unaware of the availability of required services. The utilisation of primary care services by rural people is sometimes impeded by their inability to adopt customary sources of basic care after the onset of chronic health problems (Mullan et al., 2023). This is attributed to a plethora of factors such as pre-emptive focus on an individuals' health condition rather than the presenting problem by primary care providers, inadequate training of practitioners on complex care, and structurally inaccessible consulting rooms of general practitioners.

As noted previously, rurality connotes a form of vulnerability to health risks, marginalisation, and a heightened sense of defenselessness when it comes to healthcare accessibility. However, despite the stark realities of manifold challenges within the rural health system, there is still a paucity of comprehensive knowledge of the experiences of vulnerable groups in rural areas regarding susceptibility and resilience in relation to health services utilisation (Brundisini et al., 2013). Available research on rural healthcare and the major themes discussed under barriers pertaining to service provision and utilisation are synthesised below. `

Several authors have approached the rural health problem from different perspectives with somewhat varied conclusions. While most studies blame the remote healthcare access challenges on national policy failure, there are others with a different narrative, making the rural health system research domain much more intriguing. Exploring persistent healthcare challenges in rural Canada, Ford (2016) discussed four major themes namely: population demographics, place, human resources and inadequate public participation. In this context, rural-urban drift was cited as a critical contributor to the rural populations increasingly becoming disproportionately older. The sparsely populated nature of rural settlements impede healthcare supply. Moreover, patient-provider ratio exacerbates in rural areas. Expatiating the challenge of public participation, Davis and Bartlett (2008) indicated that due to the constant migration of young and active people to urban centres for schooling and job opportunities, remote areas normally face the challenge of finding enough volunteers to serve on hospital boards and other health units.

One of the prominent rural healthcare challenges is transportation. Rural residents usually make longer trips to urban areas for services that are not available in their locale health facilities. Studies examining distance to care and transportation challenges in rural areas have concluded that without

appropriate means of transportation, even shorter distances become overwhelming hurdles for patients in rural locations (Mullan et.al., 2023; Brundisini et al., 2013; Parsons et.al., 2021). Together, these studies have suggested that the cost of transportation persistently constitutes a greater proportion of total out-of-pocket costs incurred by rural people during hospital visits. These findings affirm the seminal work of Lishner et al. (1996). Lishner and colleagues conducted a meta-analysis of access to primary health care in rural locales. Their investigation revealed that limited transportation alternatives in rural areas frustrates the remote population in accessing healthcare.

Inasmuch as transportation and distance remain critical barriers to healthcare access in rural locales, healthcare costs will be comparatively higher in these locations than in metropolitan areas. Etowa et al. (2007) concluded that insofar as the paying capacity of individuals affects their health outcomes, poverty becomes a determinant of health. As noted by Chipp et al. (2011), rural dwellers bear extra cost when they commute to metropolitan centres to access specialised health services that are not available in their local health facilities. About 60% of rural older adults and mostly women are believed to have ever forfeited their doctors appointments due to financial difficulties (Etowa et al., 2007). Financial constraints, therefore, is commonly discussed as one of the critical barriers to accessing needed health care among older people, but especially in rural areas (Goins et at., 2005; Etowa et al., 2007). Evidence in the literature show that due to the differentiated healthcare needs of persons living with complex health conditions, the cost of health services utilisation becomes prohibitively high for them (Hwang et al., 2009; Van Rooy et al., 2012), and this exacerbates for rural residents (Dassah et al., 2018).

Challenges to healthcare access in rural locations have existed for several years (Vergunst et al., 2017). Rural and remote communities continue to struggle over appreciable access to quality hospital and emergency services. People living with complex chronic health conditions face several barriers to health care access (Dassah et al., 2018), and these challenges exacerbate for rural residents (Allman, Sawyer, & Roseman, 2006). Nonetheless, the experiences of older adults with complex chronic conditions within the rural health system are not sufficiently represented in the literature. This situation is blamed on a lack of consensus on which age bracket constitutes the older adult, and compartmentalisation of chronic health conditions in scholarly works rather than a comprehensive representation or modeling of chronicity. This has led to inconsistent conclusions and straight jacket policies towards meeting healthcare needs of older adults with complex chronicity in both urban and rural communities.

2.14 Health and Health-Heeking Behaviour

In recent decades, studies on health-seeking behaviour of different demographic groups keep expanding. The growing interest in health-seeking behaviour may be due to the critical role health services utilisation plays in determining the level of acceptance of healthcare alternatives and also to assess the corresponding health outcomes (Hjelm & Atwine, 2015). Health and health-seeking behaviour are complex concepts in modern societies, particularly within rural-urban health literature due to healthcare differentials, political systems, and socioeconomic developments (Buor, 2004). Almeida et al. (2017) have, therefore, suggested a direct linkage with access and uptake of health services. Though several studies have previously attempted to explain access to and use of health services synonymously, Gyasi (2018) opines that a distinction between the two concepts is beneficial. While access to health services may indicate a set of intermediary dimensions between consumers (demand side) and entry into the care system (provider side), health services use encapsulates direct and indirect interactions with health services by a consumer (Santana et al., 2023). Utilisation, thus, serves as evidence of access to health services.

To make a proper determination of the nuances and/or the complex dynamics of healthcare systems (including the behaviours of providers and consumers) and accurately gauge the intersection of access to and uptake of needed care services, a conceptual framework is crucial. Fundamentally, the availability of care options and preferences continues to dominate the health-seeking debate. Moreover, personal interests and preferences are related to the pluralistic form of modern healthcare systems. Ultimately, individuals decide on healthcare service options open to them. These and other factors are central to the health-seeking behaviour paradigm (Oberoi et al., 2016).

Health-seeking behaviour may be described as any action taken by an individual who perceives health problem(s), in a bid to find a panacea for the problem (Ward et al., 1997). The act of health-seeking is strongly related to personal evaluation of what health and health challenges or disease severity are. Therefore, according to the scientific medical model, mere recognition of disease symptoms does not always engender healthcare-seeking (Ahmed, 1993). Whether ill-health symptoms will result in healthcare service use or otherwise, and the preference of the care modality depends on factors such as services availability and accessibility, and health beliefs (Helman, 2007).

Largely, physician visits may be influenced by complex sociocultural and behavioural factors, rather than disease severity (Zola, (1966). Similarly, healthcare-seeking has been demonstrated as a function of personal previous knowledge and experiences of sickness, faith, perception of the severity of illness and effectiveness of various antidotes (Young & Garro, 1981).

2.15 Factors Associated with Health Services Use Among Older Adults

Older adults are known to use higher health services. However, their health-seeking decisions are believed to be influenced by many factors including socioeconomic, demographic, and health conditions (Gong et al., 2016; McCracken & Phillips, 2017). Health-seeking behaviour manifests in the frequency, type of service and consistency of consultations which is normally affected by cultural belief systems, biological and socioeconomic backgrounds of older adults (Begley et al., 2011; Veugelers et al., 2003). Older individuals who utilise needed health services regularly are reported to have better health and are often inoculated from the onset of diseases compared to symptomatic healthcare users (Kim et al., 2008).

Older adults with better economic conditions tend to utilise health services more desirably than those with poor SES (Almeida et al., 2017; Brinda et al., 2016; Veugelers et al., 2003). Poor SES have been linked to poor physical and mental health, lower physical activity, and poor quality of life in older populations. Therefore, SES status may affect health service use patterns and overall health outcomes especially in older populations. For example, it has been widely documented that high SES is significantly associated with a higher likelihood of accessing regular health services (Mason et al., 2022). Thus, affordability of healthcare costs becomes prohibitive for lower socioeconomic groups, thereby preventing them from utilising needed health services (Busse, Blümel, & World Health Organisation, 2014).

Income and education-based inequalities in health services utilisation among older people has long been reported in advanced economies, particularly in Europe (Dorling & Dorling, 2013; Evashwick et al., 1984; McInerney et al., 2022). Earning higher income was associated with regular/routine physician visits among older people in Switzerland and Finland (Häkkinen, 1995; Schellhorn et al., 2000). Higher income and education were independently associated with increased GP visitations and other specialists use by older adults in London (Nelson et al., 2002). Relatedly, Santos-Eggimann, Junod, and Cornaz (2005) found specialist care services use to be positively associated with educational status in a European Ageing and Retirement health survey. Several studies have also demonstrated that gender, education, and household income are critical factors in health services use among the older population (Kim et al., 2008; Walker & Zaidi, 2016).

There is an existing school of thought that attainment of higher formal educational equips individuals with skills to better understand and navigate the healthcare system and articulate their needs better to health professionals (Wolinsky & Johnson, 1991; Xu et al., 2020). Given this argument, highly

educated older adults are expected to understand their health conditions better, identify required and available services, and articulate their feelings to primary care physicians more accurately for necessary referrals or complex clinical help models to be initiated. According to Allin, Masseria, and Mossialos (2006), well-educated older persons were 150% more likely than those with lower or no educational attainments to access needed care services. Similarly, whereas 73% of older people with tertiary qualifications made regular visits to specialist care service providers, only 29% of those with lower or no formal education used the same services in Europe (Santos-Eggimann et al., 2005).

Another factor known to affect health services use is demographic variables. These variables do not only influence patterns of health-seeking, but also treatment options as well (Audu et al., 2014; Samsudin & Abdullah, 2017). Studies have investigated and reported positive associations between gender, age, and health services uptake. Increasing age has been associated with higher health services use (Gruneir et al., 2016; Hajek et al., 2016; Mensink et al., 2013). Marital status has been shown to demonstrate significant association with health services use among older people. Holding all other factors constant, married older adults use needed health services more frequently than single individuals (Pandey et al., 2019).

Rural-urban disparities in patterns of health services use among the older population continue to attract research interest. Living in a metropolitan area has been linked to relatively higher appropriate healthcare use compared to rural locations (Gong et al., 2016). This phenomenon has been blamed on limited access to services in rural areas and the age-long *distance decay* in health services access where the cost of transportation, travel distance, and consultation appointments and waiting times are discussed as barriers to healthcare (Buor, 2004; Joseph & Phillips, 1984; Samsudin & Abdullah, 2017). Maldistribution of healthcare facilities and resources, together with commuting time and opening hours, and frequent hospital closures in rural locales, adversely affect healthcare access in rural locations (Mullan et al., 2023; Parsons et al., 2021).

Recently, few researchers have explored trends of healthcare use among older adults by racial or ethnic backgrounds (Ashton et al., 2003; Egede, 2006) and this is critical as notions of *filial obligation* differ across cultures (Litwin, 2004; Phillips & Cheng, 2012). Ethnicity and healthcare use are usually discussed along the frameworks within which population/ethnic groups acknowledge health and healthcare provision (Adeoye, 2015; Egede, 2006). This underscores the need to examine the crucial role of social networks and close-knit relations and the specific beliefs, opinions, values, attitudes, and racial backgrounds of health services use by older adults in different populations.

Moreover, another potential determinant of healthcare access by older cohorts is discrimination perpetuated by clinical staff or administrative and clerical staff. Discrimination can manifest in the

form of unequal treatment in healthcare settings by virtue of an individual's membership in a socially defined group (Olah et al., 2013). Communication gaps between providers and patients, as well as the differential approach in physician referral behaviour may explain the differences in patterns of health services uptake by older people (Hoebel et al., 2016; Lueckmann et al., 2021). The socioeconomic disparity in health resources use among various groups of older individuals tends to worsen when clinicians form negative perceptions about their older or certain group of older patients. There are reported instances where clinical staff perceive patients from low socioeconomic backgrounds as less likely to comprehend and follow through with medical regimens and embark on follow-up appointments (Woo et al., 2004). This usually leads to generic prescriptions and delayed referral to more complex or specialist care under the guise that tailoring care options to patients of low socioeconomic patients potentially ensures easy compliance and improved health outcomes (Bernheim et al., 2008). These misconceptions and the corresponding behaviours could derail medical decisions and shape patients' health-seeking patterns (Gyasi, 2018). Therefore, analysing the effects of SES on healthcare use among rural older adults is critical to achieving the global noble policy paradigms of *'ageing in place, ageing well, and active ageing'* (Walker & Zaidi, 2016, p.12).

2.16 Provider Attitudes and Health Services Utilisation by Older Adults

As discussed earlier, older individuals constitute an important group of health service users because of the higher prevalence of chronic and acute health conditions in older populations. They require more services from the health care system to manage chronic health problems, maintain functioning and reduce early mortalities (Wyman et al., 2018). However, certain behaviours of professional care providers have been found to serve as either enabling or impediment to older adults' use of needed services. There are reported instances of negative provider attitudes towards older people among care professionals in healthcare settings. This negative behavioural disposition towards older people persists across many healthcare systems. For instance, discrimination and ageist stereotypes are found to be associated with infrequent use of available healthcare services by older adults (Robb et al., 2002).

According to Lookinland and Anson (1995), nursing professionals who participated in their study demonstrated unfavourable views related to ageing and older people. Nurses have been found to associate geriatric nursing with lower professional status compared to other practice areas (Wells et al., 2004). Similarly, Hayes and colleagues (2006) indicated a dwindling interest among nursing professionals to work with older people. Several other reviews of the literature on behaviours towards older populations among physicians have reported mixed findings (Meisner, 2012), with some showing clearly positive attitudes towards older people and others neutral or negative dispositions

(Wyman et al., 2018). This phenomenon is reflected in studies of nurses' behaviours towards older patients (Liu et al., 2012). Attitudinal dispositions by healthcare professionals towards older patients have been changing over the years; a systematic analysis of published data has indicated an improvement in physicians' behaviours since 2000, but a reduction from positive to neutral among nurses (Liu et al., 2012).

Worryingly, ample evidence suggests an association between provider negative attitudes and clinical decisions when dealing with older patients (Hadbavna & O'Neill, 2013; Kagan, 2008). For example, even though there is clinical evidence that age does not affect post-operative recovery results, the likelihood of referral for surgery was lower for older patients with lung cancer in the U.K. (Peake et al., 2003). Similar trends have been observed in cardiology, where older patients, particularly older women, are more likely to have pharmaceutical treatment for coronary heart disease than surgical treatment (Wenger, 1997). Older patients were less likely to obtain prescribed therapies and conventional diagnostic tests. This was evidenced in a U.S. study, an indication of age-related undertreatment of heart attacks relative to national treatment standards (McLaughlin et al., 1996).

Another critical issue which intensifies the persistence of negative attitudes towards older adults lies within the mental care system. Uncapher and Areán (2000) discovered that doctors were less interested in helping older patients with suicidal tendencies than they were in treating younger patients with the same issues. The existence of suicidal tendencies among older persons was viewed as natural and normal from the perspective of the doctors. They were consequently less inclined to employ therapeutic techniques to address suicide thoughts in older patients. In a different study (Barnow et al., 2004), doctors and nurses working in psychiatric facilities were less likely to recommend therapy to patients displaying suicidal inclinations in reaction to a narrative representing an older client than they were in response to a vignette describing a younger client. In this instance as well, medical professionals employed in mental facilities showed a reduced readiness to treat older as opposed to younger suicidal individuals.

Poor attitudes and discrimination against older people affects their choice and patterns of health services use. Poor attitudes of healthcare professionals towards older patients are one of the critical barriers to formal health services use among older people. Particularly, the unfriendly attitudes of some nurses in healthcare facilities inhibit the utilisation of needed services by older people. In a U.S. study of barriers to healthcare access among older adults, about one-third of respondents mentioned responsiveness and/or unresponsive attitudes of physicians to their concerns as a crucial determinant of subsequent visits (Fitzpatrick et al, 2004). Similarly, negative provider behaviour has been reported to affect the utilisation of health services by older persons (Van Rooy et al., 2015). Moreover,

Aboderin and Beard (2015) showed that most older patients failed to access needed healthcare services because of the perceived age-insensitive attitudes of service providers.

2.17 Social Support and Health Services Use Among Older Adults

Social support is a broad concept that has been operationalised to cover a wide-ranging service or help such as assistance in social integration, caregiving, volunteering to the cause of older people, and advice from family, friends, and other community members. In the present study, social support is conceptualised as specific aspects of help enjoyed by older adults, as well as social connections and participation at the family and community levels as suggested by Litwin (1997).

An expanding body of literature has focused on health and social support among the ageing population (Cao et al., 2022; Chi & Han, 2022; Wang et al., 2023). Health services use is an important aspect of later life to maintain physical and psychological wellness due to the higher vulnerability of older populations to chronic health conditions. To that end, social support is considered a crucial factor in determining patterns and levels of health resource uptake in older adults. Nonetheless, the associations between social support and health services utilisation have been contradictory in the extant literature and thus, the evidence so far remains inconclusive. Again, the extent and nature of the effect of social support on health services use are not clearly laid out (Salinas-Rodríguez et al., 2018). Various arguments have been advanced regarding the association between social support and health services use. Some studies have demonstrated that formal health services utilisation increases with increasing levels of social support networks (Bretherton, 2022; Chi & Han, 2022; Wang et al., 2023). For instance, the hierarchical compensatory framework by Cantor (1989), postulates that formal services are accessed only as a last resort, thus, when informal support is not readily available. According to this model, individuals seek social support from others based on a set of ordered preferences rather than the type of assistance required. Once the initially preferred sources of support are absent or insufficient, individuals from the lower hierarchies would replace them in a compensatory manner.

Although the compensatory model has been criticized for not keeping up with demographic reality, several research reports corroborate the assumptions espoused in the hierarchical compensatory model. For instance, visitations to healthcare facilities for clinical help have been observed to be more frequent in single (including never married, divorced, separated, and widowed) individuals than in married counterparts. A study has reported an adverse effect of the absence of family support on early stay in institutionalised homes and frequent hospitalisations (Arora & Wolf, 2018). Likewise, higher use of emergency department services was observed in older adults without required family support connections, even though the pattern of GP and hospital inpatient consultations were similar across

those with and without family support (Coe et al., 1985). Older people with loose family networks have been found to access more public welfare services than those with strong family ties (Auslander & Litwin, 1990).

Usually, decision-making among older population groups on health services utilisation normally involves close relatives, hence, social networks and connections play a significant role in need assessment and determination of help to be sought (Cao et al., 2022). The involvement of family ties in the decision-making process manifests in suggestion of care options as well as the provision of tangible assistance including money and transportation that may influence access and entry into the care system. Therefore, family caregivers not only act as care providers, but also as care managers, organising and negotiating between older adults and the healthcare system (Schulz et al., 2020; Wolff et al., 2018) and thereby facilitating health services uptake. Reports are rife on the interlinkage between social support and formal care usage. Socially neglected older people, as reported by Bretherton (2022), use less formal care services such as mental health services, GP consultations, and recreational facilities. Therefore, socially neglected older persons may have poor access to health and social benefits.

In their investigation on predictors of desirable health services use, Wolinsky and Johnson observed that community and family support were positively associated with healthcare use (Wolinsky & Johnson, 1991). Similarly, a positive relationship between social support and physical contact among chronically ill older individuals has been documented. Gyasi et al. (2020) and previously, Penning (1995) found a significant positive correlation between healthcare services uptake and regular contact with family ties by older people. However, in both studies, the role of social connection appeared to be more complex and was contingent on the type of support received by older individuals. For example, older people who receive regular financial remittances from relatives normally report significantly increased health services use than those without financial support from friends and relatives. It can then be argued that a lack of and/or inadequate social support may engender health knowledge gaps and rob frail older people of needed economic and emotional help to enhance desirable access and health-seeking patterns (Prang et al., 2016). In other words, older adults with limited to no social support may encounter severe challenges in navigating the healthcare system to access the needed help.

Relative to the kind of support that influence health services utilisation, Park, Kang, and Chadiha (2018) observed that more diversified social connections were the highest predictor of healthcare utilization, followed by friends and community networks. This suggests that social networks where diversified resources are provided tend to offer older adults relevant information/knowledge and

opportunities to access health services and vice versa. Peer networks and friends are believed to encourage routine preventive care services consumption such as regular health check-ups, and the use of outpatient services for acute conditions to improve health outcomes (Park et al., 2018; Litwin, 1997). Salinas-Rodriguez and colleagues (2017) analyzed social support from multiple dimensions and investigated their associations with health services use. The authors identified a significant association between the two constructs.

From the forgoing discussion, it is evident that the availability of social support has been found to encourage health services use in later life. Overcoming the health information gap through social networking potentially improves the likelihood of taking up healthcare resources to promote healthy ageing (Park et al., 2018). According to Salinas-Rodriguez et al. (2017), health services utilisation by the older population is not only associated with health information status (information gaps), but also with several kinds of support systems. The authors further argue that older people surrounded by individuals who can provide instrumental support such as financial and transport to a clinician's office or hospital are more likely to use regular health services.

Despite the mounting evidence on the positive relationship between health service use and social support among older individuals, there are some contradictory observations on social support and health service use (Arora & Wolf, 2018; Bretherton, 2022; Cao et al., 2022). Many of the studies that could not establish significant associations between social support and older adults' health service use argued that need factors, as propounded by Andersen and Newman (1973) were the most critical predictors of health services use. Older cohorts with good network support systems may seek formal health services only in times of higher need. Alternatively, older individuals with weak social support may resort to formal health services as the only means of help for stress and emotional changes which is a natural phenomenon concomitant with ageing. Therefore, older adults with limited needed social support may use more health services. For example, Prang et al. (2016) indicated that older individuals who receive regular assistance from friends and family members tend to use lower healthcare services. In their estimation, families offer a greater amount of assistance in diverse areas of daily living following ill-health (Stansfeld et al., 2006). Hence, supportive relationships may reduce formal health services utilisation.

As outlined above, several reasons my account for older adults' health services use. The interactions of need factors and supportive mechanisms broadly influence the decision to access services.

2.18 Healthcare Access and Utilisation

Universal coverage, eligibility, inclusiveness, and removal of financial barriers to health care have been the founding principles of the World Health Organisation as well as national health systems across the universe. Despite these noble ideals, many governments have fallen short of systematically pursuing an explicit policy of equity of access to health care. Gulliford et al. (2002) attribute this situation to a lack of proper understanding of the concept of 'access'. For example, in the seminal study on the concept of access, Aday and Andersen recommended that access definition should be approached from the perspective of whether those who need health services get them or not (Aday & Andersen, 1975), implying that access might connote potential or actual entry of individuals or a population into the healthcare system. This presupposes that 'having access' indicates a potential to utilise a service when required, while 'gaining access' denotes the initiation into the procedure of utilising a service. Confusion has erupted from these two distinct applications of the term. In their study, Gulliford and colleagues (2002) scanned through relevant literature systematically and proposed four dimensions for evaluation and measurement of 'access to healthcare'. These dimensions and other related themes are discussed below.

2.18.1 Service Availability

Having unrestrained access to healthcare entails an adequate supply of services. According to Gulliford et al. (2002), this dimension of health care access relates to an opportunity to utilise health services when needed. They revealed that measurement of the availability of services has been traditionally achieved through indicators such as the number of hospital beds or physicians per capita. In their analysis using England as a case study, Gulliford and colleagues demonstrated the huge disparities that existed between districts in terms of the numbers of GPs per head of population and the proportion accessing specialist care services. Based on the disparities, the authors came to the same conclusions as Haynes et al. (1999) about the level of resources essential for healthcare, the method of resource allocation to distinct geographical locations and the public health policy design strategies to optimise the supply of health services.

Arguing from the perspective of health economics, Mooney (1983), opines that the assessment of health services availability may be realised through a relook at the costs borne by patients in obtaining care. He clarified these costs to include the costs of inconvenience and travelling incurred in the process of obtaining services or the potential health benefits forgone by not utilising the care. In his estimation, the cost of healthcare is directly proportional to geographical distance. Given this, persons who incur equal costs receive equal access. Mooney further argues that access borders on a question

of supply; utilisation is a function of the forces of demand and supply and hence, equality of access concerns equal opportunity. Therefore, whether the opportunity is exercised or not becomes irrelevant to equity in terms of access.

Other researchers have demonstrated that service availability is rather an inadequate yardstick for measuring access to healthcare. The seminal work of Aday and Andersen (1981) showed that individuals in need may normally have access to services and yet face challenges such as communication in using the services. Ordinarily, in such a situation potential access may not be achieved. Thus, Donabedian (1972) concluded that 'the proof of access is the use of service, not merely the presence of a facility'. In view of this assertion, a group of researchers developed a model suggesting that access is a degree of fit between the healthcare system and consumers (Penchansky & Thomas, 1981). This degree of fit is influenced by factors such as affordability, acceptability, and accommodation of services. Their approach opened the concept of access to embrace financial, personal and organisational barriers to service utilisation (Thomas & Penchansky, 1984).

2.18.2 Personal Barriers

The public's acknowledgement of their needs for services and their subsequent resolve to seek medical help generally form the initial step in the process of accessing healthcare. It is believed that the probability of using services on offer depends on the balance between a person's perceptions of their needs and their attitudes, beliefs and former experiences with health services (Mechanic, 1979) as cited in (Gulliford, 2002). From the meta-analysis conducted by Gulliford et al on the meaning of health care access, they demonstrated that access begins with an individual's acknowledgement of their need for services, approval to a role as a service user, and recognition of socially generated resources that they are eager to utilise (2002). They believe that these processes are contingent on sociocultural and environmental factors.

It follows that the expectations of health service users may not always concur with that of service providers. This could be exemplified in situations of non-uptake of preventive services or deferred service usage by patients presenting with frailer conditions requiring urgent medical attention (Quilliam et al., 2023). Recently, policy directions have shifted from influencing patients' behaviour to recognising patients' needs and meeting their demands by implementing a graduated service to ease demands on primary care practitioners and specialist staff in emergency departments. For instance, Gulliford and his colleagues have suggested an increased role for community pharmacies, telemedicine, and walk-in clinics as additional primary healthcare sites capable of addressing

patients' minor service needs (2002). Some of these innovations place the concept of access in the realm of remote (electronic) rather than physical access.

2.18.3 Financial Barriers

Healthcare utilisation can be influenced by financial constraints even in public health systems where all citizens are insured through national insurance policies. A typical example is the British system where services at the point of use are essentially free. However, Gulliford et al. (2002) report that there are charges for specialised consultations, including dental check-ups and eye tests. As noted earlier by Gavin Mooney (1983), service users may also bear costs arising from time off from job engagements or commuting to and from health centres. Kim et al. (2017) asserted that the effect of user fees and other access-related costs impacts various socioeconomic strata differently. While access may not be compromised for some demographic groups, the costs can serve as a significant impediment for others. It is, however, worth mentioning that the impact is subject to the significance of the costs and the patient's capacity and readiness to bear them (Quilliam et al., 2023). Thus, equal costs do not automatically translate to equal access. Monetary rewards to health care professionals can potentially affect the availability of services and the types of services available (Gulliford et al., 2002; Mullan et al., 2023).

2.18.4 Organisational Barriers

It has been widely reported that long waiting times, poor referral systems and attitudes of service providers may impede health care access (Dassah et al., 2018; Van Rooy et al., 2012; Vergunst et al., 2017). Levesque, Harris, and Russell (2013) believe that these organisational barriers to access often emanate from the inefficient deployment of available resources or a failure to configure services around patients' needs.

2.18.5 Relevance and Effectiveness of Access

As already alluded to in this review, healthcare access is a sequential process in which entry into, and services utilisation covers a limited part of the forces between demand and supply for healthcare. The prime objective is to improve health status. Rogers et al. (1999) describe ideal access as delivering the right health services within the appropriate time in the right environment. Similarly, Millman (1993) sees access as the timely deployment of health services to obtain the best possible result. To this end, access is evaluated through relevant indicators of health status. It has been shown that

organisational obstacles to access may lead to deferrals in treatment, which potentially cause dissatisfaction among patients and may result in adverse clinical outcomes (Scheer et al., 2003). Scheer and colleagues portend that assessment of access should be based on health outcomes, rather than on availability or utilisation of services, may give different conclusions. Gulliford et al. (2002) claim that poor quality of services may translate into frequent utilisation whereas quality services with improved health status ultimately reduce the need for subsequent utilisation.

2.18.6 Equity and Access

An effective way of ensuring equity in healthcare access is the management of healthcare resources to meet the needs of various population groups. Equity, on the other hand, upholds the principle of fairness or social justice. A popular definition of equity encapsulates fairness in terms of access for subgroups with equivalent needs (Moss et al., 2023; Quilliam et al., 2023). This horizontal equity is mostly gauged using availability, utilisation and outcomes of health (Mooney, 1983;1996). Several studies have focused on health service utilisation as the dominant indicator of access, with the nexus between utilisation and need being presented in a form of need ratios or by standardising utilisation measures for variations in needs via regression models (Mooney, 1983; Van Doorslaer et al., 2000). Van Doorslaer and colleagues (2000) reported that more advanced investigations have revealed little evidence of horizontal inequity in the utilisation of care, even in countries where access is believed to be strictly rationed according to payment capabilities. Conversely, inequity in health outcomes is widely reported.

A critical challenge to assessing equity of access is rooted in the diversity of health problems across different groups. Gulliford et al. (2002), discussed that health needs for similar problems differ and specific subgroups have their own beliefs, values, and priorities. Therefore, groups with varying needs require services that are properly differentiated in terms of quantity and quality. In his view, this vertical dimension of health equity is noted to be more cumbersome to assess than the horizontal, not least because there is not much agreement on how vertical equity could be deemed to exist (Mooney, 1996).

2.19 Behaviour Model of Health Services Use

Health care utilisation refers to the use of health services by individuals to prevent the onset of diseases, promote good health and well-being as well as cure health problems (Collins et al., 2013). Needs-based health systems serve the objective health demands of the population. In successful needs-based systems, overuse, underuse, and misuse of services are significantly checked (Lederle et

al., 2021). Otherwise, there is a risk of compromising the health of an individual and placing a burden on the care system (Wolfe & Stevens, 2018). To prevent misuse, overuse, and underuse of health services, it is crucial to consider the non-use of care, which is evaluated through various individual and contextual factors. Over the years, several health care models have been developed across different disciplines to explore and predict patterns of health services use by individuals (Ricketts & Goldsmith, 2005).

The current study proposes the use of a robust and leading framework in population and public health research; Andersen's behavioural model (Andersen, 1995, 2008) to guide the analysis and discussion of the findings. This framework is a well-validated model used in explaining determinants of service use, which embraces both personal and societal determinants of accessing health services (Anderson, 1973). Thus, Andersen's behavioural model offers insights into contextual factors relating to health services utilisation. Central to the behavioural model is that a person's use of health services balances on three functional domains namely, predisposition, enabling and need factors (Andersen, 1995). Predisposing factors, as popularly called, may include age, sex, marital status, education, race, occupation, as well as a set of beliefs (Bradley et. al., 2002). For instance, persons who believe in available healthcare services are more likely to use the services when need is perceived. Enabling factors comprise family and community resources, residential location, and social capital. The need component encompasses personal judgement and evaluated/diagnostic assessment (Andersen, 1995). Since the development of the original model in the late 1960s to assist in unpacking why individuals use health services (Andersen, 1968), the model has undergone several modifications and updates over the years (Aday & Awe, 1997; Andersen, 1995). During the 1970s, the original model was expanded to accommodate measures of service usage in specific conditions and illnesses, as well as patient satisfaction. A third phase evolved a few decades ago, recognising changes in personal practices and the maintenance and upturn of health status as the primary goal of health services delivery (Gelberg, Andersen, & Leake, 2000). Here, the dynamic nature of the behavioural model, with post-utilisation outcomes affecting subsequent functional domains (predisposition, enabling and need) and health behaviours were recognised (Andersen, 1995).

Recently, a revised and expanded version of the model has been developed to cater for investigations involving vulnerable populations. The behavioral model for vulnerable populations (Gelberg et al., 2000), recognises the unique factors such as housing, stigma, and discrimination potentially affecting health services utilisation by vulnerable groups. Based on the characteristics of vulnerable populations evidenced in literature (Aday, 1994; Rew, 1996), which might impact their health-seeking behaviour and ultimately, their health outcomes, Gelberg et al. (2000) proposed the model for vulnerable groups to provide unique insights into the determinants of health services use of this

subpopulation groups. These group of individuals include older adults, people living with chronic health conditions, ethnic minorities, children, undocumented immigrants, adolescents, and homeless persons. The authors argue that applying specialised models of service utilisation to such population is very advantageous in uncovering their differential challenges faced in accessing required services for targeted policy options to improve their health outcomes (Gelberg et al., 2000). As the population of interest in this study (older adults with complex chronic conditions) fit perfectly in the category of a vulnerable population, the behavioral model as seen in Fig 2.1 with a focus on vulnerabilities was adopted and tailored to suit the research approach and the population.

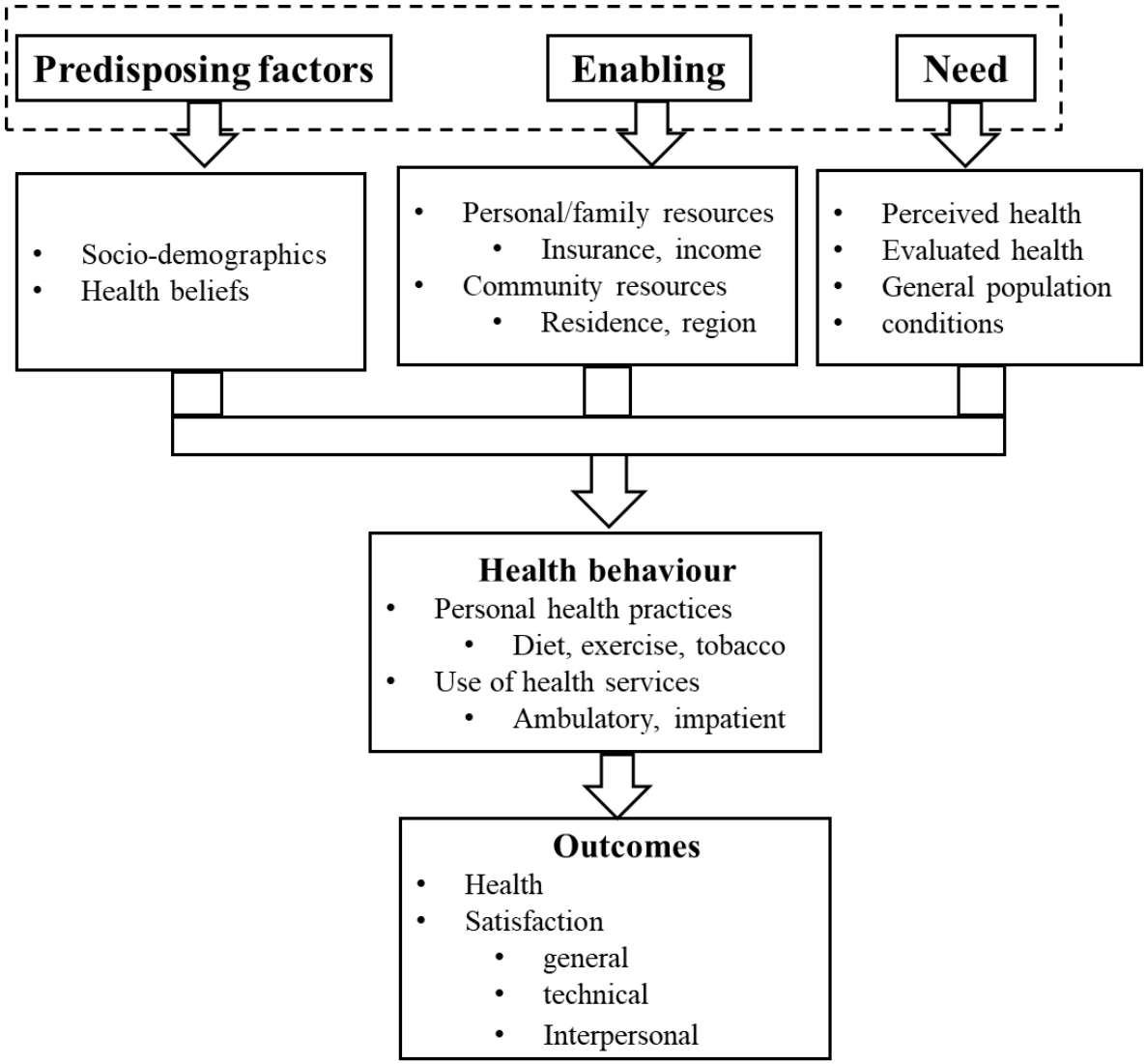

Figure 2.1 The Behavioural Model of Health Services Use

Source: Adapted from (Andersen, 2008)

Generally, the model exemplifies an adaptation of the behavioural framework that includes determinants to consider when investigating health services use by vulnerable groups and the corresponding health outcomes (Gelberg et al., 2000). Hence, Gelberg and colleagues argued that some of the factors such as needs and enablers will need to be tailored to a specific vulnerable

population of interest in the application of this model. The framework for vulnerable populations, also known as Gelberg-Andersen Behavioral Model (Gelberg et al., 2000), is divided into traditional and vulnerable domains. As earlier noted, it is a specialised and expanded version of the traditional behavioural conceptual framework which aggregates the influence of personal and environmental factors (predisposing factors), enabling resources, and needs (divided into objective and perceived) to explain patterns of health care utilisation by individuals. The vulnerable domains including unstable housing, mental illness, and substance abuse were later added (expanding it from the traditional model to the vulnerable population model) to make it more reasonable for vulnerable population studies. This is because vulnerable individuals may face unique challenges different from that of the general population. The latter added domains focus on social structure and enabling resources (Gelberg et al., 2000).

2.19.1 Predisposing Factors

According to the traditional model, predisposing characteristics of an individual to healthcare utilisation comprise the demographic profiles, such as age and sexual characteristics that contribute to the biological underpinnings of health services demand. A recent application of this model (Sutter, 2017) has further highlighted aspects of social structure (education, occupation, race, culture) that may influence healthcare need. Sutter (2017) elaborated on social status or identity within a community, as well as the availability of resources in the community as critical in informing an individual's life choices. These aspects of social structure are culture, ethnicity, education, and occupation. Andersen (1999) explained that attitudes, values, and knowledge an individual upholds about health which ultimately contribute to need perceptions of health services constitute health beliefs. The predisposing vulnerable domain embraces wide social structure characteristics such as living conditions, literacy, childhood characteristics, residential history, mobility, psychological resources, and drug abuse (Gelberg et al., 2000).

2.19.2 Enabling Resources

Enabling resources are composed of personal, familial, and community characteristics that must be in place to facilitate an individual's access to health services. Typical of these factors is the availability of healthcare centres, transportation, health insurance status, individual income, having a regular source of care provision, and region (Andersen, 1995). Availability and use of social services, competing needs, public benefits, comorbid conditions, and availability of information sources are the additions introduced by the expanded enabling vulnerable domain (Gelberg et al., 2000).

2.19.3 Need

Traditionally, the need domain manifests in two aspects: the perceived need (i.e., self-perception) and objective appraisals (i.e., evaluated needs). The former (i.e., perceived need) has been instrumental in predicting health-seeking behaviours and clinical treatment adherence, whereas the latter (i.e., objective appraisals) are concerned with the type of medical course patients require after medical diagnosis by a healthcare provider (Andersen, 1995). The vulnerable need domain introduced perceptions and objective needs that distinctively affect marginalised demographics, such as tuberculosis and HIV/AIDS patients. The proponents suggested that when predicting mental health care services usage or associated outcomes to need in this domain, mental problems and drug abuse, for instance, should be included in the 'need' domain rather than the 'predisposing' domain (Gelberg et al., 2000).

2.19.4 Personal Health Practices

Personal health practices concerns lifestyle or behavioural choices such as self-care, physical exercise, nutrition, and adherence to medical regimens. The use of health services lies within this domain (Andersen, 1995). Gelberg et al. (2000) introduced hygiene, food sources, and sexual behaviour into the expanded model for vulnerable populations. The outcomes of Andersen's model extend beyond the conventional vs. vulnerable dichotomy and embraces both perceived and objective health status, as well as care satisfaction (Andersen, 1995). The expanding application of the behavioural model of health services use has been associated with its flexibility to systematise equity and unequal access to health services through its constructs. This strength could be even enhanced by adding direct effects of services use on psychological factors (aside from social factors) as contributing to inequity (Von Lengerke et al., 2014). The behavioural model theorises the constructs of need, predisposing, and enabling factors from both the individual and contextual perspectives. Therefore, the framework can be easily applied in different disciplines including sociology and psychology to study various aspects of health-seeking behaviour (Von Lengerke et al., 2014).

Despite its effectiveness in highlighting determinants of health services use among vulnerable population groups for actionable policy strategies, there is limited application of the behavioural model in studies analysing health needs and services utilisation by older adults with complex multimorbidity, especially in rural and remote areas. To analyse healthcare use by multimorbid older adults, mixed methods designs can offer crucial and rich data within gerontological healthcare research (Baumann et al., 2016). They help record nuanced descriptions and complex issues relating

to health care needs and health services. Three major problems, other than the physical health issues, characterised the older populations with chronicity: mental health problems, access to needed health services, and competing needs. Mental health conditions and psychological distress among older adults with complex multimorbidity are associated with poor physical health outcomes, and higher healthcare demand, and compound the challenges to receiving healthcare. Again, older adults with complex morbidities in rural locales are more likely to experience limited access to care and poorer health outcomes. Moreover, older adults with complex care needs are less likely to be able to navigate the complicated care system for their needs. Therefore, complex needs may affect older adults' use of needed services.

2.20 Critical Comments on Existing Studies Reviewed

The literature reviewed shows that ageing, healthcare access, and health services use determinants continue to engage the attention of researchers, healthcare professionals, and policy planners. Several researchers have analysed various determinants of health and healthcare services use among the ageing populations in Australia and other parts of world. Together, these studies highlight the range of different mechanisms and interactions proposed to underlie associations between healthcare access and health outcomes among older people. However, much of the studies underrepresented rural data and were methodologically limited to capturing lived experiences and unique circumstances of various older subpopulation groups, and thus precludes drawing definitive conclusions on rural older adults. For example, most of the studies used quantitative methods to study the patterns and associations between health services utilisation and its predictor factors without a clear understanding of the underlying reasons that drive these associations. Therefore, it cannot be claimed with certainty that the reported factors associated with health services use in the general older population can be extrapolated to rural older people, especially those living with complex chronic health conditions.

A further limitation of research on healthcare needs and services use of older people in rural areas to date is that the views of older people and their carers in determining needs and service provision approaches are often underrepresented. Even when the opinions of older people and that of their providers are analysed, they are often examined independently in separate studies rather than as part of an integrated analysis. Consequently, research examining health needs and factors of services utilisation from the perspective of older individuals and their care providers in an integrated manner is needed. In addition, few studies have focused specifically on health needs and patterns of health services use of older adults living with complex chronic physical and mental health conditions in rural Australia. Importantly, mental health conditions such as depression, anxiety, and psychological distress sometimes coexist with physical health conditions in older adults. Hence, the care needs of

older people with multiple physical and mental conditions and their health services use patterns can be possibly differentiated from those without multimorbidity of physical and mental diseases. Therefore, there is the need to understand the independent effects of physical and mental health conditions on rural healthcare demand by older adults and to proffer care models capable of meeting the care needs of older individuals living with multimorbid health conditions.

This thesis directly addresses the gaps outlined above with the aim of aiding rural health service planners and providers with valuable information for rural health policy design and practice.

2.21 Chapter Summary

This chapter provided an overview of ageing and chronic health conditions, followed by a discussion of healthcare services use by older adults as determined by a complex interplay of contextual, individual, systemic, and sociopolitical factors. Rural healthcare access challenges were also presented. Further, a description of the Andersen's behavioural model of health services use, and the ways in which it has been used to examine older adult's use of health services in rural areas was addressed. Considering the reviewed literature and the ultimate focus of this research is a public health policy-oriented, the current study's methodology is carefully designed to address the research problem. Although most of the extant studies on health needs and healthcare utilisation reviewed used quantitative methods to study the patterns and associations between health services utilisation and its predictor factors, it is crucial to incorporate qualitative data in health needs and services research because they better capture the worldviews of study participants (Camfield, Crivello, & Woodhead, 2009). Qualitative techniques are more amenable to capturing contextual and subjective views and experiences of study participants and highlight complex dynamics of health behaviours and outcomes that quantitative tools are unable to demonstrate (Calestani, 2012; White & Pettit, 2007). Therefore, this thesis adopted a mixed methods approach to achieve the research objectives. The next chapter outlines the methodology of this study.

CHAPTER

3

RESEARCH PARADIGM AND DESIGN

3.1 Introduction

The primary objective of this study is to examine factors associated with health services use by older people with chronic conditions and, to understand their unmet healthcare needs, barriers to health services, and how they navigate the healthcare system in accessing needed health services in rural environments. This chapter summarises the research methodology employed to achieve the key study objectives.

3.2 Philosophical Research Underpinnings of the Study

Scientific enquiries are founded on philosophical and epistemological beliefs about the nature of truth or reality. Thus, the ontology of knowledge (the notion of the existence of knowledge in the social world) can be unravelled and the epistemology of knowledge addresses how the existing knowledge in the social world is unravelled (O'leary, 2014). Researchers normally arrive at what knowledge exists through the application of different paradigms. It has been argued that researchers need to be abreast of the various epistemologies as a choice of a particular paradigm underpins the research design and expected outcomes (Mackenzie & Knipe, 2006). A scientist may choose a specific research paradigm but the suitability of the choice or a combination of different paradigms will be dependent on the objective(s) of the investigation. Broadly, four research paradigms have been discussed by prior researchers (Mackenzie & Knipe, 2006). These are the positivists/postpositivist, the interpretivist, the transformative, and the pragmatic. However, the methods and tools related to these paradigms often cross boundaries.

Positivism, the oldest paradigm dates to the works of great philosophers such as Auguste Comte, Aristotle, John Locke, and Emmanuel Kant (Mertens, 2005). Its proponents argue that human society is governed by natural laws and that scientific studies are undertaken to unravel these laws (Park, Konge, & Artino, 2020). Scholars of this paradigm believe that the social world is best studied scientifically, as the natural world, to explore life patterns for the purpose of prediction and generalisation (Bergman, 2008; Johnson & Onwuegbuzie, 2004; Mackenzie & Knipe, 2006; Mertens, 2005; Tashakkori & Teddlie, 2021). Hence, positivists argue that knowledge must be unravelled through observation and measurement of the objective world (Creswell & Plano Clark, 2003; Terrell, 2012). They, therefore, advocate for deductive methods in which events are properly organised and interrelated, and therefore reality is ordered and deducible (Cresswell, 2003; Sukamolson, 2007).

The interpretivist paradigm, on the other hand, can be traced to the philosophical activities of David Husserl and Wilhelm Dilthey that espoused the ideas of phenomenology and hermeneutics (Mertens, 2005). It is founded on a naturalist perspective to research, which birthed the qualitative investigation

phenomenon (Trochim, 2006). Central to the interpretivists' argument is that the social world should be investigated from the standpoint of human experiences and expressions by which human construct their social world. This paradigm, therefore, prioritises meanings humans attach to their actions and inactions rather than observed events (Cresswell, 2003; Mackenzie & Knipe, 2006). Qualitative researchers, therefore, study a specific population comprehensively and attempt to explore social patterns rather than discover general laws of human behaviour (Mack et al., 2005).

The transformative research approach surfaced in the 19th century as an offshoot of the dominant (interpretivism and positivism) research paradigms. It was necessitated by an attempt to make scientific research more inclusive to cover marginalised populations in the social world. The premise of the transformative paradigm was equity and paradigm shift in research agenda. This research approach emphasised on the adoption of methods and procedures that can capture the interests of minority groups. Transformative approach make use of tools from both interpretivist and positivist paradigms (Mackenzie & Knipe, 2006).

The pragmatic paradigm is credited to the activities of George Herbert Mead, John Dewey, Richard Rorty, Patton, William James, Cherryholmes, and Murphy in the 1990s. In line with the transformative research approach, pragmatism is not based on a single philosophical viewpoint. Rather, this paradigm is more concerned with the research problem and the best possible approach(s) to achieve the research objective (Cresswell, 2003). Accordingly, Patton (2002) postulated that the aim of a study should guide its methodology. The pragmatic paradigm laid the foundation for several mixed-method research studies (Teddlie & Tashakkori, 2010) due to its flexibility to accommodate multiple methods, as well as diverse data collection and analysis procedures in a single research study (Cresswell, 2003)). It has been argued that the amalgamation of different research approaches offers a better understanding of the world around us (Foss & Ellefsen, 2002; Moran-Ellis et al., 2006). In view of this, many social science and related disciplines including social gerontology, public health, and social policy researchers have increasingly considered mixed methods as more appropriate to provide a genuine balance of strengths and weaknesses of different approaches and thereby ensure a better grasp of different perspectives of the intricate phenomenon of thoughts. The pragmatic paradigm, thus, combines features of positivist and constructivist paradigms.

Given that research paradigms offer researchers the relevant assumptions to decide on the appropriate methodology, the pragmatic paradigm is selected as the guiding epistemology of the current research project. The suitability of this paradigm is derived from the fact that the problem under investigation (health needs and care services use and experiences of chronically ill older adults) is multidimensional and requires more than a single research approach to achieve the study objectives. Moreover, in the

era of unprecedented population ageing and increasing prevalence of multimorbidity in later life, it is critical to explore care needs and patterns of health services utilisation among older adults from different methodological dimensions. Older adults from different socio-economic and cultural backgrounds may have complex, diverse experiences and health services needs and consumption patterns. Further, there has been relatively scant research attention to unmet healthcare needs and patterns of health services use by rural older adults incorporating both quantitative and qualitative paradigms. Hence, using a mixed method in the current study can provide invaluable contributions to the literature.

3.3 Design of this Study

To make the outcome of this study more robust and appealing to different stakeholders such as public health practitioners, policymakers, rural health advocacy organisations, and health services providers, a mixed-methods design was employed (Abowitz & Toole, 2010; Fellows & Liu, 2021; Johnson & Onwuegbuzie, 2004). Mixed methods provide a vital opportunity for addressing measurement errors, verification of results, and delving deeper into the phenomenon of interest to unravel the underlying reasons for initial findings (Johnson et al., 2007; Camfield et al., 2009). Based on this, it has been asserted that multiple methodological approaches are more desirable in health and other wellbeing studies (Calestani, 2012). According to Creswell (2011), mixed methods are unique in their ability to gather data through different techniques to provide a holistic understanding of the problem under investigation.

Three types of mixed methods dominate academic circles. The pure mixed designs place an equal premium on both the quantitative and the qualitative approaches (QUANT + QUAL), including their philosophical foundations (positivist and interpretivist) (Johnson, Onwuegbuzie, & Turner, 2007). This approach employs insight from qualitative and quantitative approaches to address the research problems. Next, is the qualitative dominant mixed methods (QUAL+quant), denoted as *Qualitative Mixed* in Figure 3.1. Users of this approach normally integrate quantitative data and approach into a qualitative study but prioritise the philosophical underpinning of qualitative designs (constructivist). As demonstrated in Figure 3.1, the third mixed methods design with a quantitative dominance is the *Quantitative Mixed* (QUANT+qual). Here, researchers incorporate qualitative data and approach at different phases of their otherwise quantitative design but retain the positivist philosophical underpinning (Johnson et al., 2007).

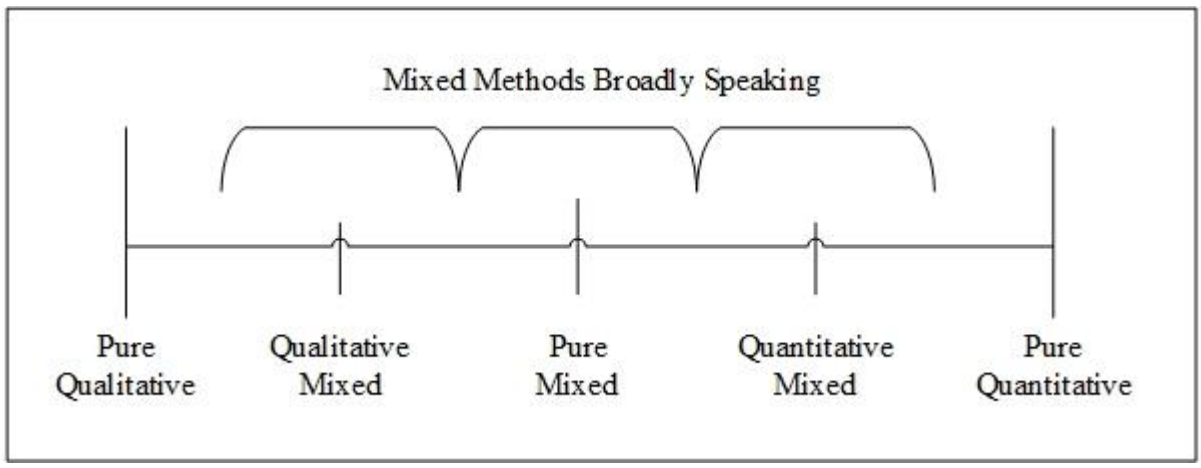

Figure 3.1 Types of mixed methods design

Source: Andoh (2018)as modified from Johnson, Onwuegbuzie, and Tuner (2007, p. 124)

From the foregoing, the 'QUANT+qual' mixed methods was adopted in the present research. This approach was suitable to investigate the pattern of relationship between chronic health conditions, socio-demographic variables, and their effect on health services utilisation based on a quantitative analysis of survey data (phase 1). It also examined the dynamics by which multimorbidity and psychological distress interact to predict healthcare demand in rural environments.

In mixed methods design, researchers usually incorporate features of the qualitative and quantitative approaches at various stages of the project (Bryman, 2008). However, the extent to which the methods have been integrated is laid out by researchers in the data collection and analysis procedures (Niglas, 2009). In the present study, both quantitative and qualitative techniques were employed in the data collection, processing, and analysis. The two-stage sequential mixed methods approach, as described by (Morse) (2010, p. 341) (QUANT+qual) that is primarily driven by the pragmatic paradigm (Bryman, 2008; Johnson et al., 2007) was adopted. Pragmatists use the research problem to determine research frameworks. Thus, the pragmatist paradigm focuses on 'what works best' to answer research questions (Ary et al., 2018). Therefore, pragmatism focuses on actions other than philosophical underpinnings.

As outlined above, pragmatism concentrates on shared beliefs and experiences that are connected to actions (Morgan, 2014). Pragmatism advocates the use of mixed methods which enables a better understanding of realities aiming at addressing research questions (Ary et al., 2018). The rationale for adopting a mixed method approach is that neither qualitative nor quantitative designs are independently sufficient to highlight the trends and details of the phenomenon, such as a multifaceted issue of health services utilisation by the rural older population. Tashakkori and Teddlie (1998) have demonstrated the complementary strength of qualitative and quantitative methods for scientific analysis when used in combination.

The decision to analyse data in two phases was based on the need to first understand the pattern of associations between rurality, disease burden, and health services use. In the quantitative phase, the South Australian Monitoring and Surveillance System (SAMSS) survey data (Dent et al., 2017; Taylor & Dal Grande, 2003; Taylor et al., 2014) helped in identifying and examining the prevalence of chronic conditions in all (rural and urban participants) the older population and patterns of health service usage in the South Australian healthcare system. In the later phase, qualitative text information collected through individual semi-structured interviews and focused group discussions with healthcare providers shed more insights into the factors tested in phase one. The reason for this sequential arrangement is that the numeric data and results give a general overview of the research problem (Creswell & Clark, 2017), that is what factors contribute to and/or hinder older adults' health services utilisation, while qualitative and its results helped refined and elaborated on statistical output through participants' views.

3.4 Data Source and Design of Data Collection Instruments

The study analysed cross-sectional survey (secondary data from the South Australia's Department of Health) data and qualitative interviews to achieve the research objectives. Phase 1 involved the use of the South Australian Monitoring and Surveillance System (SAMSS) survey data. Since 2002, the government of South Australia's Department of Health (Dent et al., 2017) has been collecting population-level data on the health and wellbeing of the state's population. This monthly state-wide survey aims to monitor the health of all South Australians by tracking overall health status, chronic conditions, health service utilisation, food security, mental health, wellbeing and disadvantage and inequity among other issues of importance to the state. Each year, around 7,000 South Australians of all ages with access to a phone are randomly selected to participate in the survey. The survey's name (SAMSS) was changed in 2017 to South Australian Population Health Survey (SAPHS) (Joshi et al., 2021). It adopts a dual over-lapping strategy (mobile phone 70%; landline 30%) through random digit dialling to reach a more representative sample of the population. The telephone calls are made on a rotation of shifts across all times of the day and evening (up until 8:30 pm on weekdays and 5.00 pm on weekends) with coverage over 7 days of the week. Standard de-duplication and weighting procedures for the dual over-lapping frame are administered. Where a selected person is not available, an alternative household member cannot be interviewed as a replacement.

The interviews are usually conducted in the English language, lasting approximately 20 minutes by professional interviewers and responses are entered with the help of a computer-assisted telephone interviewing (CATI) system. The instruments used in this population health survey have been

designed to meet national and international standards. See attached (Appendix A) for the questionnaire items and further details of the survey.

The second phase involved in-depth, individual interviews with a small sub-sample of rural older adults and focuses group interviews with health service providers using a semi-structured interview guide. The interviews with the older people covered participants' socio-demographic information, health conditions, living arrangements, health needs and lived experiences in accessing needed care. Moreover, barriers to and enablers of health services utilisation were explored from the perspectives of both healthcare professionals and older adults to help understand the dynamics involved in meeting the healthcare demands of the ageing population with chronic health conditions in rural locales. All interviews were conducted by the researcher with the help of the lead supervisor to enhance data quality (Braun & Clarke, 2006) and with the prior consent of participants, each interview was audio recorded. The findings of both phases have been presented as chapters in the thesis (Bergman, 2008).

As indicated earlier, sequential mixed method designs may either be QUAL+ quant or QUANT+ qual approach. In either of these two, the initial phase sets the basis for the subsequent phase. For instance, in the QUANT + qual sequential designs, the quantitative phase (phase 1) is used to establish patterns of associations between variables and the prevalence in the sample from the population of interest. The next phase provides underlying reasons and elaborate details for the associations and established patterns, as demonstrated by Doh (2012).

With the current study, the QUANT + qual design (Qualitative Mixed as exemplified in Figure 3.1) was adopted because prior quantitative studies have discussed a few predictor variables. It was only critical to investigate the extent to which these variables predict the uptake of various types of health services through the available state survey data. The qualitative study was designed to offer in-depth knowledge of the associations between the predictor variables and health services use among rural older adults with chronic health conditions.

3.5 Target Population, Sampling, and Recruitment of Respondents

3.5.1 Target Population

The target population in this study was older adults (60 years or over) living with chronic health conditions in rural South Australia. The state's population health survey data (2013-2017) was available from the Department of Health. In this dataset, a subsample of 20522 respondents across the state were 60 years or older and was selected for the initial analysis of this study. The reason for selecting older people from both rural and urban areas was to compare (objective 1 of this study) the burden of chronic conditions and patterns of GP service use in South Australia. Using the Modified

Monash Model of geographical classification, a total of 6435 out of the 20522 older population of interest lived in rural and remote locales. Data on these population cohorts were used for all the analyses in phase 1 of the study. Of note, the sampling criteria, recruitment, and data collection strategies of this survey have been described earlier in this chapter.

3.5.2 Recruitment and Data Collection for the Qualitative Phase of the Study

Phase two of the study commenced to provide further insights into the findings of phase 1 and involved a purposive sampling of interviewees from older adults and their healthcare providers. In sequential mixed-method designs, interviewees for phase 2 are usually selected from the same group of respondents of the study's phase 1 (Bergman, 2008). However, due to the deidentified nature of the SAMSS survey data obtained from the Department of Health for phase 1, the researcher could not verify whether the selected interviewees necessarily participated in the State's health survey. A total of twenty (20) older adults (≥60 years) from rural and remote communities were selected for in-depth interviews in phase 2. The selected older adults were met individually at their preferred place of convenience as per prior arrangements with the researcher for the conduct of the interviews. Moreover, three different focus group interviews were organised with fifteen (15) rural healthcare practitioners to understand their perspectives on the research problem. All interviews were conducted between April 2022 and July 2022. A shopping voucher worth AU$20.00 was given to each participant in this phase as an honorarium. The study did not require any research assistant.

3.6 Data Management, Preparation, and Analysis

Data handling is the initial step in any research project involving data analysis (Richards, 2014). The quantitative phase of this study was handled with the help of SPSS version 25 (IBM Corp., Armonk, NY, USA). The researcher chose SPSS mostly because he is more conversant with this statistical software and also because it has a wide range of potential applications. It offers a variety of tools that may be used for both simple and complex analysis, as well as for changing variables and creating new ones (Arkkelin, 2014). The coding and analysis of the interview data were done with the help of the NVivo software version 20 (2020 Edition). Further details of this study's data management and analysis procedures have been provided in the method sections of the individual studies within the results chapters.

3.7 Ethical Concerns

In research projects, ethical considerations revolve around the questions of what is appropriate and inappropriate in the study process, particularly in dealing with participants and reporting findings

(Babbie, 2013). Therefore, the necessity for ethical considerations is crucial as it guarantees that researchers strike a balance between a study project's possible advantages and risks to its participants (Haggerty, 2004). To achieve this, certain actions were taken to guarantee that the researcher and participants of this study both conformed to accepted ethical norms (Kumar, 2011).

First, ethics approval was granted by South Australia's Department for Health and Wellbeing Human Research Ethics Committee (HREC/18/SAH/89) (Appendix B) for the use of SAMSS survey data. For phase 2, a proposal for ethics clearance was submitted to the Flinders University Human Research Ethics Committee before beginning fieldwork, and it was approved on August 19, 2021, with clearance number 4647 (Appendix C). The ethics clearance number was clearly written on all data collection tools and information sheets. Also, the approval letter was shown to any participant of the study who was interested to verify.

Second, the information sheets, consent forms, (Appendix D) and flyers (Appendix E) all made it clear that participation in the study was optional. Before any interview, those who volunteered to take part in the study had to sign a consent form indicating their agreement. Interviewees were also asked for permission to audio-record the interviews. Additionally, participants were permitted to withdraw from the study at any point in time during the study. Again, participants were not obliged to answer any question they deemed sensitive or has the potential to bring back bad feelings. However, none of the participants withdrew from the study at any point nor complained about the interview questions as being too sensitive or distressing. Notwithstanding, community health help lines including that of 'Lifeline', 'Beyond Blue', 'Regional mental health service', and 'Community mental health service' were provided to participants to call or inform the interviewers to call whenever they experienced distress as a result of their participation.

Third, where specific examples and quotations are used in this thesis, actual names are not used to safeguard the anonymity and confidentiality of participants and their responses. This prevents the respondents' identities from being revealed (Emam et al., 2009). After the data collection, all information that might identify any participant or participants was erased. Additionally, the names of the participants were not included in the labelling of the transcriptions of the data.

3.8 Chapter Summary

This chapter has explained the design and implementation of the methodology of this thesis. In summary, the chapter has presented the philosophical perspective underpinning the study design, recruitment strategies and data collection procedures. Also, details of data management and analytical processes, methods justification, and ethical considerations are presented. The next 4 chapters present the results of the data analysis in the form of 4 studies each answering a sub-objective of the research problem.

CHAPTER

4

THE PREVALENCE OF CHRONIC PHYSICAL AND MENTAL HEALTH CONDITIONS IN OLDER ADULTS ACROSS SOUTH AUSTRALIA AND THEIR INDEPENDENT EFFECTS ON GENERAL PRACTITIONER VISITS

Dennis Asante[1], Craig S. McLachlan[2], and Vivian Isaac[1]

[1]College of Medicine & Public Health, Rural and Remote Health, Flinders University, Renmark, SA, Australia

[2]Health Vertical, Centre for Healthy Futures, Torrens University, Sydney, NSW, Australia

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Author Contributions

DA contributed 70%, CSM 10%, and VI 20% to the research design, data analysis, and writing and editing of the manuscript, respectively.

Summary

Rural older adults (≥60 years) compared to their urban counterparts are identified as higher users of general practitioner (GPs) services. However, whether this pattern of health seeking is influenced more so by physical or mental health conditions is unclear. We explore the independent effect of chronic physical and mental health conditions on the pattern of GP use in Australia. Interview datasets on population health were available from South Australia's Department of health in 2013-2017 (*n*=20522). We examined the prevalence of common physical and mental health conditions and GP use by the Modified Monash Model of remoteness. Physical and mental health burden was similar across South Australia. GP visits with suicide ideation for rural and remote locations were 4.7 (95% CI, 1.6-13.6) and 4.8 (95% CI, 1.9-11.7) respectively, compared to urban Adelaide which was 1.5 (95% CI, 1.0-2.3). While there is equal distribution of mental health burdens across South Australia, access to mental health resources for nonurban older Australians remains a significant challenge.
Keywords: *General practitioner, health services, rural health, older adults, health status*

4.1 Introduction

Rapid population ageing has heightened global concerns about meeting the health care demands of older adults (Henderson et al., 2018; World Health Organisation, 2015). In Australia, the older adult population is projected to increase for individuals aged 60 and above by 22.5% in 2050 (Australian Bureau of Statistics, 2015a; Australian institute of Health and Welfare, 2019). Population ageing is associated with a higher incidence of chronic and disabling physical and mental conditions with a correspondingly greater need for health services (Nie et al., 2008). However, the resources to meet the demand of health service needs of older adults (≥60 years) with chronic physical and mental conditions in rural and remote environments are limited (McGilton et al., 2018). The front-line clinical services for the ageing population are medical general practitioners (GPs). In the context of GPs being a limited resource, it is important to examine the determinants of high general practice service use in rural Australia, for ageing populations.

In Australia, about 35% of older adults live outside of urban areas (Australian Bureau of Statistics, 2013; Henderson et al., 2018) where access to health services is noted to be constrained (Henderson et al., 2018; Muir-Cochrane et al., 2014). For instance, limited access to specialist health resources and support services and extended waiting times for GP appointments has been described in an Australian rural context (Polain, Berry, & Hoskin, 2011). The limited access to care services among rural and remote Australians (Australian institute of Health and Welfare, 2019b; Dempsey et al.,

2003) implies that the country's rural older adults may be experiencing unmet healthcare needs compared to their urban counterparts.

In South Australia compared with other Australian states, the state has had higher rates of Arthritis, diabetes, osteoporosis, cancer, stroke, back problems, hypertension, and high cholesterol (Australian Bureau of Statistics, 2015b). South Australia is also one of the Australian states with a higher proportion of mental health problems compared to other Australian states and territories (Australian Bureau of Statistics, 2015b). A South Australia Department of Health report has indicated that about 10.8% of adult South Australians live with at least a diagnosed mental health condition (Taylor & Dal Grande, 2003). Again, South Australia has the highest proportion of people with high and very high levels of psychological distress of all Australian states and territories (Australian Bureau of Statistics, 2015b). Also noteworthy is the fact that South Australia is predominantly regional and remote communities with a higher proportion of the older population. The state only ranks second to Tasmania on the ageing profile with a projected over 30% of its population aged 65 years and over, compared with 27% for Australia by 2051 (Australian Local Government Association, 2004).

Higher levels of unmet mental health services need have been observed in older populations in rural and remote communities (Coalition on the Ageing (COTA), 2018; Townsend et al., 2006). A report by the Australian Bureau of Statistics (2013) indicated that 8.6% and 5.9% of the 65-74- and 75-84-year-olds in the Australian population had experienced a form of mental illness within the previous year. The National Ageing Research Institute (2009) in Australia observed 6-20% of older persons in communities to be suffering from depression. Compared with urban areas, the suicide rate of older people in rural locales is about 40% higher, and that of remote areas was around double the rate observed for Australian cities (National Rural Health Alliance, 2017). Further, the rate of anxiety-related problems based on age-standardized percentages is lower (12.8%) in major Australian cities compared to rural (15.5%), and remote (15.1%) areas (National Rural Health Alliance, 2017). Delayed treatment, undertreatment, and even inadequate recognition or diagnosis of mental conditions in rural locales are commonly reported (Crabb & Hunsley, 2006).

There is a paucity of data on health service needs and gaps for older adults with mental health challenges in rural locations (Muir-Cochrane et al., 2014). Available datasets suggest that older people in rural areas with mental health problems rely primarily on GPs for help (Crabb & Hunsley, 2006; Henderson et al., 2018). However, it is not clear if older people access GP services for mental health issues independent of their pre-existing chronic physical conditions. The aim of this study, therefore, is to investigate the independent effect of physical and mental health conditions on patterns

of GP use based on geographical location. Secondly, to compare the burden of chronic physical and mental health conditions between rural, remote, and urban South Australia.

4.2 Materials and Methods

4.2.1 Survey Design and Research Sample

Data were obtained from the South Australian Department of Health and Ageing database. The dataset analysed in this study was obtained between 2013 and 2017. The South Australian Monitoring and Surveillance System (SAMSS) is a monthly population health survey conducted by the South Australian Department of Health and Ageing (SA Health) (Campostrini et al., 2019). All households in South Australia listed in the Electronic White Pages (EWP) are eligible for selection in the sample (Avery et al., 2004). A total of 7000 South Australians are recruited for interviews every year. SAMSS survey adopts a dual over-lapping sampling approach (mobile phone 70%; landline 30%) through random digit dialling (Campostrini et al., 2019). This sampling technique is designed to cover a more representative sample of the population. The overall response rate was 69%. South Australians of all ages with access to a telephone are eligible to participate (Campostrini et al., 2019).

The survey tracks the trends of disease conditions, healthcare challenges and health service-related issues relevant to South Australia at regular intervals (Campostrini et al., 2019). This Government health survey aims at addressing the healthcare needs of the SA population through informed policy mechanisms that are more responsive and targeted (Avery et al., 2004). This dataset monitors both state and national health priority areas to determine and assess the effectiveness of and/or need for health policy interventions (Department of Health, 2008). Thus, the data offer appropriate retrospective population health information for monitoring health status, responding to population changes, and aiding formulation and implementation as well as assessment of health programs. With the help of Computer Assisted Interview (CATI) technology, the survey is conducted by professional interviewers in the English Language for approximately 15-20 minutes. The CATI system enhances the immediate entry of data from the interviewer's questionnaire to the computerised database. This system is highly rated for its ability to capture high-quality data on rural and regional locales where the cost of administering face-to-face interviews in previous surveys has led to underrepresentation (Eckert, Taylor, & Wilkinson, 2004). Additional information about the aims, methods and initial reports of the survey have been documented in detail previously (Avery et al., 2004).

To investigate the geographical differences, we distinguished between urban, rural, and remote areas based on the Modified Monash Model (MMM) of geographical taxonomy. Using postcodes, MMM categorises all Australian locations and territories as urban, regional, or remote (Modified-Monash-

Model, 2012). This model assigns places a category from MM1(urban cities) to MM7 (very remote) based on their population size and remoteness from capital cities and services. The modified Monash Model classification system is prepared by the Australia Department of Health, using remoteness and population data from the Australian Bureau of Statistics (Drovandi & Woolley, 2020).

4.2.2 Measures

4.2.2.1 Sociodemographic Variables:

Survey respondents were categorised into three age (in years) groups including 60-69, 70-79, and 80 or above. Other variables included the individual's probability of utilising health services when the need arises; gender and highest formal educational attainment were included in the analyses. These characteristics of the sample are depicted in Table 4.1.

4.2.2.1 Health Service Utilisation Measures:

Using the previous twelve months as the reference time, survey participants were asked to recall their frequency of GP consultations. Based on the responses, we measured the outcome variable (GP consultations) through a three-categorical scale: not at all/nil visits, 1-5 visits, and 6 or more visits, corresponding to the linguistic terms; no, low, and high GP use, respectively. It is worth noting that these classifications of health services use were adapted from similar studies (see (Dempsey et al., 2003; Eckert, Taylor, & Wilkinson, 2004) on patterns of health services utilisation.

4.2.2.3 Chronic Physical Health Conditions:

In the SAMSS survey, interviewees were asked to report whether they suffered from a list of medical conditions that had been diagnosed by a healthcare professional which has persisted or is expected to last at least six months. In this analysis, some of the commonly reported diseases including stroke, heart attack, heart disease, diabetes and cancer were investigated (Avery et al., 2004).

4.2.2.4 Mental Health Conditions:

Similar to the measurement of the physical health conditions, respondents freely indicated any diagnosed health condition from a lists of mental health challenges ranging from depression, and anxiety to suicide ideation and psychosocial distress. We analysed data on anxiety, depression, and suicidal ideation. Table 4.2 presents percentages of survey respondents meeting self-reporting criteria for physical and mental health 'cases' for this study.

4.2.3 Data Analysis

Data on older individuals (≥60 years) between 2013-2017 were considered for this analysis. The total sample size for this investigation was 20522 survey participants. Based on the response rates and the study's objectives of highlighting the difference in disease burden and GP service use between urban and nonurban areas in general, the 7-MMM classification codes were categorized into three locations including MM1(urban city), MM2-4 (rural areas) and MM5-7 (remote areas). Descriptive statistics using frequencies and percentages were used to describe the sociodemographic and baseline characteristics of the participants. The chi-square test, or Fisher's exact test when appropriate, was used to evaluate the differences in the prevalence of chronic physical and mental health problems based on geographical location. Similarly, the chi-square test was used to evaluate the association between chronic physical and mental health conditions and the frequency of GP use. Multivariate logistic regression models were used to explore the independent effects of mental health problems on GP use after controlling for age, gender, and chronic physical conditions. All statistical analyses were performed using the Statistical Package for Social Science (SPSS) software version 24.0 (IBM Corp., Armonk, New York, NY, USA) and statistical significance was defined at a value of $p < 0.05$.

4.3 Results

A total of 20522 observations were analysed, comprising urban Adelaide (*n*= 13498), rural (*n*= 2981), and remote locations (*n*= 4043). In the population sample, 60.7% were females and 42.9% of the community participants were within the 60-69 age bracket. Residents in Metropolitan Adelaide (MM-1) were more likely to be better educated (45.6% held TAFE/Diploma or a university degree) than residents in other Modified Monash Model (MMM) categorisations (Table 4.1).

Table 4.1 Sample characteristics

Sample Characteristics	Categories	URBAN N (%)	RURAL N (%)	REMOTE N (%)	Total N (%)
Gender	Male	5473 (38.9)	966 (40.4)	1634 (40.4)	8073 (39.3)
	Female	8614 (61.1)	1426 (59.6)	2409 (59.6)	12449(60.7)
Age	60-69	6041 (42.9)	1005(42.0)	1843 (45.6)	14087(43.3)
	70-79	4874 (34.6)	911 (38.1)	1448 (35.8)	2392(35.8)
	80+	3172 (22.5)	476 (19.9)	752 (18.6)	4043(21.4)
Education	Basic	944 (6.7)	255 (10.7)	392 (9.7)	14054(7.8)
	High School	6697 (47.7)	1271(53.3)	2388 (59.1)	2386(50.6)
	TAFE/Diploma/Degree	6413 (45.6)	860 (36.0)	1259 (31.2)	4039(41.7)

4.3.1 Prevalence of Physical and Mental Health Conditions Based on MMM Categories

Overall, the proportions of survey participants with physical health conditions were not statistically different across the MMM categories (Table 4.2). About four per cent of the total sample, across various geographical locations, had stroke, heart attack (6%), and heart disease (8%). However, the prevalence of diabetes was moderately higher in rural (18.2%) and remote (17.1%) areas than in urban Adelaide (15.6%). The percentages of cancer patients in the study samples were 24% for urban Adelaide and, 24.9% and 23.4% for rural and remote communities, respectively. The prevalence of mental health conditions related to anxiety was 5% in Adelaide, 5.1% in rural locales, and 4.3% in remote locations. Those that self-reported as living with depressive symptoms or were diagnosed with depression were 5.9%, 6.4%, and 5.2% for urban, rural, and remote locations, respectively. Except for remote localities (0.8%), there was a similar percentage (1%) of suicidal ideation in urban and rural areas (Table 4.2).

Table 4.2 Prevalence of physical and mental health conditions based on geographical location**.**

Conditions	Categories	URBAN N (%)	RURAL N (%)	REMOTE N (%)
Physical Health				
Stroke	Yes	588 (4.2)	96 (4.0)	142 (3.5)
	No	13499 (95.8)	2296 (96.0)	3901 (96.5)
Heart attack	Yes	930 (6.6)	153 (6.4)	252 (6.2)
	No	13157 (93.4)	2239 (93.6)	3791 (93.8)
Heart Disease	Yes	1350 (9.6)	203 (8.5)	331 (8.2)
	No	12737 (90.4)	2189 (91.5)	3712 (91.8)
Diabetes	Yes	2197 (15.6)	435 (18.2)	693 (17.1)
	No	11868 (84.2)	1953 (81.6)	3341 (82.6)
Cancer	Yes	3375 (24.0)	589 (24.9)	945 (23.4)
	No	10700 (76.0)	1802 (75.4)	3094 (76.6)
Mental Health				
Anxiety	Yes	700 (5.0)	123 (5.1)	172 (4.3)
	No	13387 (95.0)	2269 (94.9)	3871 (95.7)
Depression	Yes	837 (5.9)	153 (6.4)	209 (5.2)
	No	13250 (94.1)	2239 (93.6)	3834 (94.8)
Suicidal thoughts	Yes	129 (1.0)	22 (1.0)	29 (0.8)
	No	13083 (99.0)	2211 (99.0)	3777 (99.2)

Table 4.3 Physical and mental health conditions and use of general practise services in the past 12 months, based on geographical location**.**

Conditions	Urban			Rural			Remote		
	None%	<5%	>6%	None%	<5%	>6%	None%	<5%	>6%
Physical Health									
Heart disease									
No	3.1	58.7	38.2	4.3	59.6	36.1	4.6	59.4	36.0
Yes	0.9	34.5	64.6	0.5	28.4	71.1	0.3	39.0	60.7
Stroke									
No	3.0	57.5	39.6	4.1	57.6	38.3	4.3	58.5	37.1
Yes	0.9	31.5	67.7	1.1	41.3	57.6	1.4	36.2	62.3
Diabetes									
No	3.3	59.2	37.5	4.8	60.1	35.1	4.9	60.0	35.1
Yes	0.4	41.3	58.3	0.2	42.5	57.2	0.9	47.2	51.9
Heart attack									
No	3.1	57.8	39.1	4.2	58.6	37.6	4.5	58.0	38.5
Yes	0.3	35.7	64.0	-	38.4	61.6	0.4	45.2	54.4
Cancer									
No	3.3	58.5	38.2	4.9	59.6	35.5	4.9	60.9	34.1
Yes	1.6	49.6	48.8	1.0	48.8	50.2	1.9	47.3	50.8

Mental Health									
Anxiety									
No	3.0	57.6	39.4	4.2	57.7	38.1	3.4	58.7	37.0
Yes	0.3	33.2	66.5	-	42.5	57.5	1.8	37.3	60.9
Depression									
No	3.1	58.0	39.0	4.2	58.2	37.6	4.4	58.7	36.8
Yes	0.1	31.0	68.8	-	38.4	61.6	1.0	39.5	59.5
Suicidal thought									
No	2.9	56.7	40.4	4.1	57.8	38.1	4.	57.7	37.9
Yes	1.6	32.8	65.6	0.0	23.8	76.2	0.0	25.9	74.1

The total percentage does not equal 100% due to missing responses.

4.3.2 Patterns of GP Services Use

The level of GP primary care service use, stratified by MMM categories, is presented in Table 4.3. There was no statistically significant variation in the frequency of GP visits across the study locations. However, rural (76.2%) and remote (74.1%) residents reported higher (≥6 visits) GP presentations for mental health care such as suicidal ideation than older adults in the urban area (65.6%). Regardless of mental health conditions, the following characteristics were correlated with a high GP attendance: being female, increasing age, and the presence of chronic physical condition(s) (see Tables 4.3 and 4.4).

Again, no statistical difference was observed between the effects of chronic physical conditions and the frequency of self-reported increased GP consultations across South Australia. Nevertheless, there existed some variations between the populations in the three adopted MMM geographical locations regarding GP visits for chronic physical disease care. For instance, GP presentations by stroke patients were higher in urban Adelaide (67.7%), compared to rural (57.6%) and remote (62.3%). Similarly, cancer and diabetes patients in the urban city reported higher use of general practice service use than their colleagues in rural and remote areas (see Table 4.3).

Table 4.4 explains multivariate models on the independent effects of physical and mental conditions on high GP use. Female gender and increasing age were associated with high GP use (Model1). Females were slightly more likely to consult a GP; in urban (OR, 1.2, 95% CI, 1.1-1.3), rural (OR, 1.1, 95% CI, 0.9-1.3) and remote (OR 1.2 (1.1-1.4) locations. Respondents aged 80 years or above were twice or higher more likely to use GP services compared to adults aged 60-70 years. In urban South Australia, the odds of high GP use were 2.7 (95% CI, 2.4-3.0). A similar pattern was observed in rural (OR 2.1, 95% CI, 1.6-2.7) and remote locations (OR 2.6, 95% CI, 2.2-3.2).

Heart disease, stroke, and diabetes were independently associated with higher GP use after controlling for gender and age in Model 2. In rural locales, older adults with heart disease were 3.5 times more

likely to use GP services compared to individuals without heart conditions (OR, 3.5, 95% CI, 2.5-4.9). Similar associations were recorded for the other physical conditions (see Table 4.4).

Model 3 confirms anxiety, depression and suicidal thoughts were independently associated with increased GP health seeking after controlling for gender, age, and chronic physical conditions. Respondents with suicide ideation were 4.8 times more likely to present to GP offices compared to individuals without (OR, 4.8, 95% CI, 1.9-11.7) (see Table 4.4, Model 3).

Table 4.4 Multivariable regression on the association between physical and mental health conditions and high use of general practice services

	URBAN		
	Model 1 OR (95% CI)	**Model 2 OR (95% CI)**	**Model 3 OR (95% CI)**
Gender (Female)			
Male	Ref		Ref
Female	1.1 (1.0-1.2)	1.3 (1.2-1.4)	1.2 (1.1-1.3)
Age			
60-70	Ref		Ref
70-80	1.9 (1.7-2.0)	1.7 (1.6-1.9)	1.8 (1.7-2.0)
>80	2.9 (2.6-3.0)	2.5 (2.2-2.7)	2.7 (2.4-3.0)
Physical health			
Heart disease		2.6 (1.3-2.9)	2.5 (2.2-2.8)
Stroke		2.8 (2.3 -3.4)	2.7 (2.3-2.4)
Diabetes		2.2 (2.0-2.4)	2.2 (1.9-2.4)
Cancer		1.4 (1.3-1.6)	1.4 (1.3 -1.6)
Mental health			
Anxiety			2.2 (1.8-2.7)
Depression			2.9 (2.4-3.4)
Suicidal thought			1.5 (1.0-2.3)
	RURAL		
	Model 1 OR (95% CI)	**Model 2 OR (95% CI)**	**Model 3 OR (95% CI)**
Gender			
Male	Ref		
Female	1.0 (0.8-1.2)	1.1 (0.9-1.4)	1.1 (0.9-1.3)
Age			
60-70	Ref		
70-80	1.6 (1.3-1.9)	1.4 (1.1-1.7)	1.5 (1.2-1.8)
>80	2.4 (1.9-3.1)	1.9 (1.5-2.5)	2.1 (1.6-2.7)
Physical health			
Heart disease		3.4 (2.4-4.8)	3.5 (2.5-4.9)
Stroke		1.8 (1.2-2.8)	1.8 (1.2-2.8)
Diabetes		2.2 (1.7-2.8)	2.2 (1.7-2.7)
Cancer		1.7 (1.4-2.1)	1.7 (1.4-2.1)
Mental health			
Anxiety			1.8 (1.2-2.7)
Depression			2.4 (1.6-3.6)
Suicidal thought			4.7 (1.6-13.6)
	REMOTE		
	Model 1	**Model 2**	**Model 3**

	OR (95% CI)	OR (95% CI)	OR (95% CI)
Gender			
Male	Ref		
Female	1.1 (0.9-1.2)	1.3 (1.1-1.5)	1.2 (1.1-1.4)
Age			
60-70	Ref		
70-80	2.0 (1.7-2.3)	1.8 (1.6-2.1)	1.9 (1.6-2.2)
>80	2.8 (2.3-3.4)	2.4 (2.0-3.0)	2.6 (2.2-3.2)
Physical health			
Heart disease		2.3 (1.8-2.9)	2.2 (1.7-2.8)
Stroke		2.2 (1.5-3.2)	2.2 (1.5-3.2)
Diabetes		1.9 (1.6-2.3)	1.9 (1.6-2.2)
Cancer		1.9 (1.6-2.3)	1.8 (1.6-2.2)
Mental health			
Anxiety			1.8 (1.2-2.6)
Depression			2.2 (1.5-3.0)
Suicidal thought			4.8 (1.9-11.7)

Abbreviations: OR = odds ratio; CI = confidence intervals; Ref = reference category

4.4 Discussion

We analysed survey data (SAMSS survey data) from the South Australian Department of Health to compare the burden of physical and mental health conditions and their independent effects on GP visitations. We observed that the prevalence of physical and mental health conditions was largely similar across MMM categories in South Australia. Again, there were no statistically significant differences between urban and nonurban participants with respect to the frequency of self-reported GP consultations. Irrespective of geographical location, older adults with chronic physical and mental health conditions reported a higher frequency of visits to GP offices. Importantly, mental health conditions were independent predictors of higher GP use in rural and remote communities.

This analysis is one of only a few attempts to study health conditions and patterns of health services uptake in larger population samples using the modified Monash model geographical taxonomy. Contrary to an earlier report of approximately 1.4 times higher disease incidence in nonurban Australia against urban centres (Australian institute of Health and Welfare, 2019b), our data suggest an equal burden of physical and mental health conditions across the MMM classifications employed in this study. We suggest that this contradiction may be because we refined our population to South Australia. Previous studies focused on an Australia national dataset. Hence, disaggregated data may have unique characteristics, which may have been lost to a less refined larger national data set on health. Also, our categorisation of the seven MMM indexes into 3 (urban, rural, and remote) may have blurred the actual differences in the physical and mental health burden across geographical areas. Of note, our results support a similar report on the incidence of cardiovascular disease (CVD) in a Northwest Adelaide study where the researchers concluded that Metropolitan areas do not always

have better CVD risk profiles and outcomes than rural and remote areas (Tideman et al., 2013). International studies such as that of Sun and colleagues (2022) did not find any significant difference in risk factors and depression prevalence between urban and rural older Americans. Similarly, Y. Hu, Li, and Martikainen (2019) report that after controlling for demographic characteristics, and urban and nonurban locations, trajectories of depression burden in later life did not change over time. In summary, our findings are not unique to South Australia, for example, similar conclusions have been reported in other advanced healthcare systems around the world when contrasting urban and rural environments or pooled population samples (Kessler et al., 1994; Parikh et al., 1996; Romans-Clarkson et al., 1990).

Patterns of GP visitations for both chronic physical and mental health assistance were generally similar in the study settings. Despite the reported evidence that access and use of health services decrease with increasing rurality (Humphreys et al., 2002; Kathleen Strong & Strong, 1998), there was no significant difference emanating from the data on self-reported high-frequency usage (>6) of GP services across the geographical areas. However, rural, and remote older adults made more GP visitations for mental health needs than their urban counterparts. This result confirms previous observations in South Australian population surveys (Dempsey et al., 2003; Eckert et al., 2004), and similar findings have been reported in older health system record audits (Roh et al., 2017; Roos et al., 1999). Underutilisation of speciality mental health services prevails among rural older adults; this is despite changes in mental health services delivery to a more personalised care and support. This result coincides with previous research findings in Canada and the US, suggesting that older adults with mental health conditions in rural environments tend to use less specialised mental health services (Crabb & Hunsley, 2006, 2011; Roh et al., 2017; Sanders, Fitzgerald, & Bratteli, 2008; Sanders et al., 2017).

The higher GP presentations for mental healthcare needs among rural and remote older adults stress the need for making mental health resources easily accessible and available in nonurban Australia (Coalition on the Ageing, 2018; National Rural Health Alliance, 2017). This will help solve the problem of overreliance on GP services for mental health care for improved mental well-being as reported in earlier investigations (Futeran & Draper, 2012; Henderson et al., 2018).

Without recourse to the physical health condition, age, and gender, anxiety and depressive ‘cases’ were associated with a frequent presentations to GP offices. Our observations on the higher use of GP services for mental health services align with earlier assertions that older adults are less likely than younger individuals to consult speciality mental health professionals for mental health care (Crabb & Hunsley, 2006; Muir-Cochrane et al., 2014). Nonurban older adults with anxiety and

depressive symptoms may be less likely to be referred to mental health professionals in urban centres by their GPs. Thus, except for extreme cases, rural and remote older Australians rely greatly on GP services for mental health needs, a situation believed to exacerbate their health and well-being outcomes (Crabb & Hunsley, 2006).

4.5 Conclusion and Limitations

Using data from a cross-sectional population survey, we studied the prevalence of chronic physical and mental health burdens and their independent effects on GP visitations in South Australia. Largely, our data show no significant difference in either disease burden or frequency of GP services use across the MMM categories in this study. However, rural, and remote older adults use GPs more for mental healthcare needs as opposed to management of their chronic conditions. Given the prevalence of mental health seeking via GPs consultations in other reported studies (Crabb & Hunsley, 2006, 2011; Roh et al., 2017; Sanders et al., 2008; Sanders et al., 2017) align with our results, our findings do reinforce the need for governments and other stakeholders to act effectively to improve mental health services in rural and remote areas. Some limitations should be considered when interpreting the results of this study. First, the findings reflect a representative sample of the SAMSS survey data and may not be reflective or generalisable to other states and territories in Australia, where characteristics of rural communities such as population density and accessibility of health resources may differ. Specifically, South Australian regions are predominantly small rural or remote with only few communities classified under MMM as rural and Adelaide as the urban city (Modified-Monash-Model, 2012). Moreover, other crucial determinants of health services utilisation such as income levels and socio-cultural factors (Andersen, 1995; Anderson, 1999; Marmot & Allen, 2014) were not accounted for in the current analysis. Again, the study relied on self-reported doctor diagnosed conditions and health services use. The issue of recall among older people may have impacted the accuracy of information recorded. More in-depth analysis is warranted to untangle the relationship between mental health problems and primary healthcare service use (Eckert et al., 2004). Future studies may account for these possible limitations and replicate our findings.

PROLOGUE TO CHAPTER 5

The findings of the first study in the current thesis (viz., (Asante, McLachlan, & Isaac, 2022) suggested significant associations between physical and mental health problems and general medical practitioner visits by older adults across urban and rural areas in South Australia. Moreover, certain demographic characteristics, including increasing age and female gender were strongly associated with high GP service utilisation. However, older people in rural and remote communities were more likely to resort to GP services for mental health challenges than their urban counterparts. The results suggest among other things, geographical differences in the understanding of mental health and specialist mental health services use among older adults in Australia (Asante, McLachlan, & Isaac, 2022). Socioeconomic factors and the availability of specialist services may be crucial determinants of specialist healthcare use in older populations rural areas.

Using available data from the SAMSS survey, the next study in this thesis (viz., Asante et.al., 2022) extends these results by examining the patterns and determining factors associated with specialist services use among older adults across rural and urban South Australia. Specifically, outpatient specialist doctor services for chronic disease management and mental healthcare were examined. The study contributes to a more fine-grained understanding of ageing and specialist health services utilisation and disparities between rural and urban locations.

CHAPTER

5

SPECIALIST CARE VISITS OUTSIDE THE HOSPITAL BY SOUTH AUSTRALIAN OLDER ADULTS

Dennis Asante[1], *Agyemang-Duah Williams,[2] Fiona Stanaway[4,] Paul Worley[3]*, and Vivian Isaac[1]

[1]College of Medicine & Public Health, Rural and Remote Health, Flinders University, Renmark, SA, Australia

[2] Department of Geography and Planning, Queen's University, Kingston, Ontario, Canada K7L 3N6

[3] Riverland Mallee Coorong Local Health Network, SA Health, Government of South Australia

[4]Sydney School of Public Health, Faculty of Medicine and Health, University of Sydney, Sydney Australia

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Summary

A growing number of older adults with complex health conditions require specialist medical services. Limited access to specialist medical services is a major barrier to healthcare in rural areas. Rural-urban differences and factors associated with specialist services use in old age are poorly understood. Using the SAMMS 2013-2017 population health survey (n=20522), we compared rural-urban specialist doctor consultations outside of the hospital by older adults (≥60 years) across South Australia. The Modified Monash Model (MM1-7) of remoteness was used to categorise the data into rural (MM 3-4), remote (MM5-7), and urban (MM1-MM2). Specialist doctor consultation in the past 4 weeks was 14.6% in our sample. In multivariable analysis, increasing age, higher educational attainment, diagnosed physical health conditions and common mental disorders, and residing in urban areas were associated with higher specialist care use. Specialist care use among rural (odds ratio 0.8, 95% CI: 0.6-0.9, p< 0.001), and remote (odds ratio 0.8, 95% CI: 0.7-0.9, p< 0.001) older people was significantly lower than their urban counterparts after controlling for age, education, and chronic disease. Our findings demonstrate a disparity in the use of out-of-hospital specialist medical services between urban and non-urban areas.

5.1 Introduction

Specialist doctors provide diagnostic and treatment services for specific ailments and help in managing chronic health conditions. Specialist medical services include geriatric medicine, rheumatology, neurology, and urology. Older people (60+ years) constitute 16.5% of the Australian population and are the greatest users of specialist health services (Australian Institute of Health & Welfare, 2021). In 2019-2020, about 14.6 million older adults were treated by a specialist in the country, which constituted 1 in 2 (46%) specialist claims (Medicare-subsidised consultations) (Tam & Clarke, 2015). Specialist care services (particularly geriatrics services) are crucial for chronic health management to ensure improved quality of life and independent living in old age (Ettelt et al., 2006). However, access to specialist care services among older people in rural and remote communities is a concern in many countries (Ettelt et al., 2006; van Gaans & Dent, 2018).

There is expanding research on the impact of geographical location on health services use (Liu et al., 2007; Zeng, Xu, & Tao, 2022), and health outcomes (Luo et al., 2022). Where people live impacts their health status, health behaviours, and health services use patterns (Sibley & Weiner, 2011). Rural older adults have reduced access to needed health services, increasing their risk of experiencing poorer health outcomes (Asante, McLachlan, et al., 2022; McGilton et al., 2018). For example, limited access to geriatric support and mental health services has been described in the Australian rural care system (Henderson et al., 2018). Additionally, several social determinants of health

including education, income, social support, and housing may determine older people's access to and use of health services in rural locations (Sibley & Weiner, 2011; Suominen-Taipale et al., 2004).

Rural people tend to experience poorer health outcomes than urban residents, largely due to disadvantages in social determinants of health (Abshire et al., 2021). Social determinants of health (SDH) are the factors that impact individuals' health and wellbeing, which include locations where people were born, live, work and age, as well as the accessibility and responsiveness of health services to their needs (Lutfiyya et al., 2012; Marmot & Allen, 2014; Paul et al., 2021). Rural populations are also linked with lower levels of socioeconomic status such as lower education, and lower household incomes and both are associated with a higher risk of multiple chronic conditions and poor health outcomes (Wanless, Mitchell, & Wister, 2010). One would hypothesise that, with higher rates of complex chronic diseases, patients living in rural and remote areas would require higher specialist medical services.

In Australia, the rural-urban difference in health services such as general practice (GP) visits, hospitalisations, and emergency department (ED) visits have been previously reported. While the use of GP services is largely similar across regional and urban areas (Asante, McLachlan, et al., 2022; Eckert et al., 2004), rural and remote Australians have higher rates of hospitalisations, and poorer access to, and use of, primary health services (National Rural Health Alliance, 2017) Even though, these reports have highlighted the access gaps and health disparities between rural and urban locations, there is limited understanding of rural-urban differences in specialist doctor visits among older adults, including determining factors of specialist care services use.

Over the past decades, continued research efforts have been devoted to developing and refining models of health services access and use to inform policy initiatives. A widely used framework is the Andersen (Andersen, 1995) model, which has been applied to understand health service use for vulnerable populations such as refugees and homeless populations. This model suggests that personal health services use balances on three functional domains; predisposing factors (e.g., age, sex), enabling variables (e.g., location, social support, income, health literacy, belief systems) and need variables (e.g., health status, perception of illness) (Andersen, 1995). The utility of the model in understanding specialist medical service use among older individuals is limited in the Australian context.

Based on the Anderson model of health services use, this study proposes that older adults' use of specialist doctor services is explained by sex and age (predisposition); educational attainment -as a proxy to income/wealth, and location (enabling factor); and diagnosed health conditions (need). Our study aims to compare self-reported specialist doctor visits outside of the hospital by older adults

(≥60 years) across rural and urban South Australia and to validate the factors of specialist visits with the constructs of Andersen's model in the study sample.

5.2 Materials and Methods

5.2.1 Survey Design and Research Sample

Population health survey data (2013-2017) was available from the South Australian Department of Health database. This cross-sectional survey (the South Australian Monitoring and Surveillance System (SAMSS) draws a sample of approximately 7000 from listed households in the Electronic White Pages (EWP) across the state every year (Campostrini et al., 2019). Through random digit dialling, the SAMSS survey uses a dual overlapping sampling strategy (70 per cent mobile, 30 per cent landline) (Campostrini et al., 2019). This sampling technique is intended to include a representative sample of the population. The only inclusion criterion is a resident of South Australia with access to a telephone and the average response rate of this survey is 69%. (Campostrini et al., 2019).The survey monitors disease burden, access issues, and other critical health concerns of South Australians at regular intervals (Asante, McLachlan, et al., 2022; Avery et al., 2004). Hence, the data provide pertinent retrospective population health information to help in designing policy interventions that are more responsive and focused to meet the health needs of South Australians (Avery et al., 2004).

Each interview lasts for about 15-20 minutes. Interviews are conducted in English by trained interviewers and responses are recorded using computer-assisted interviewing (CATI) technology. This system is highly effective in collecting high-quality data on rural and remote communities where the costly conduct of face-to-face surveys has led to the underrepresentation of rural cohorts in prior studies (Eckert et al., 2004). Further information on the survey's objectives, methodologies, and initial findings can be found elsewhere (Avery et al., 2004).

5.2.2 Geographical Classification

The Modified Monash Model (MMM) was used for rural-urban and remote categorizations. The Australian Department of Health developed the modified Monash Model geographical classification system using data on population and remoteness from the Australian Bureau of Statistics (Drovandi & Woolley, 2020). Based on ABS data, the model assigns a remoteness index (MM1-MM7) to various postcodes across Australia (Modified-Monash-Model, 2012). We designated postcodes as urban (MM1-MM2), rural (MM3-MM4) and remote (MM5- MM7) based on their population densities and proximity to major cities and services.

5.2.3 Measures

5.2.3.1 Sociodemographic Variables:

Baseline demographic characteristics such as age, educational attainment, and gender were included in the analyses. Age (in years) was categorised into three groups including 60-69, 70-79, and 80 or above. Education was assessed in three categories namely basic/primary, high school, and diploma or above (Table 5.1).

5.2.3.2 Specialist Health Services Use:

Specialist doctor visits were assessed with the item "In the last four weeks, have you used Specialist doctor services (not in a hospital)", with binary response categories 0= no and 1= yes. It is important to note that this question was not intended to include outpatient specialist services that took place in hospitals.

5.2.3.4 Physical Health Conditions:

Survey respondents self-reported common doctor-diagnosed health conditions. The reported medical conditions analysed in this study include diabetes, heart attack, heart disease, and cancer. According to available data, these are the most common chronic conditions in Australian older adults (Australian Institute of Health and Welfare, 2023).

5.2.3.5 Mental Health Conditions:

Like physical health conditions, respondents indicated the presence of any doctor-diagnosed mental health condition and/or ongoing treatment for a mental health condition.

5.2.4 Ethics Statement

The study received ethics approval from the relevant institutional review committee.

5.3 Statistical Analysis

All analyses were performed using IBM SPSS software version 24.0 (IBM Corp., Armonk, New York, NY, USA) and statistical significance was set at $p< 0. 05$. Frequencies and percentages were used to describe the demographic characteristics of the survey respondents. Pearson Chi-Square test assessed rural-urban differences in the use of specialist doctor services. The difference in the use of

specialist services by demographic variables and health conditions (diagnosed health conditions vs non) was similarly determined by the Chi-Square test. Multivariable logistic regression models were used to explore the effects of explanatory variables on specialist services use, mutually adjusting for other variables in the model.

5.4 Findings

Table 5.1 shows the characteristics of the research sample. Of the 20,522 (urban = 13,498; rural = 2981; remote = 4043) participants analysed in this study, 60.7% were female and the mean age was 72.33 years (SD = 8.34), with the age range 60-69 years constituting 42.9%. Older adults in urban Adelaide reported higher educational qualifications (45.6% with a diploma or degree certificate) than rural and remote respondents.

Table 5.1 Characteristics of the sample

Sample Characteristic	Categories	SPC N (%)	Chi-square (p-value)
Gender	Male	1254(15.5)	8.537(.003)
	Female	1750(14.1)	
Education	Basic	198 (12.4)	45.971(.001)
	High School	1383(13.4)	
	TAFE/Diploma/Degree	1416(16.6)	
Age	60-69	1156(13.0)	33.709(.001)
	70-79	1140(15.8)	
	>85	708 (16.1)	
Location	Urban	2218(15.7)	44.082(.001)
	Rural	294 (12.3)	
	Remote	492 (12.2)	

5.4.1 Patterns of Specialist Doctor Visits Outside a Hospital

Prior to the survey, 14.6% of the participants had at least ever-consulted a specialist doctor within the past 4 weeks given the timeframe. Respondents aged 80 years or over (16.1%) were more likely to visit a specialist doctor compared to those in the 60-69 (13%) age group (X^2 =33.709, p <0.001. (Table 1). Older adults who had completed a diploma or degree course (16.6%) accessed more specialist services than the proportions with high school (13.4%) and basic school (12.4%) qualifications (X^2 =45.971, p <0.001). There was a statistically significant difference in specialist health services use by geographical location. A greater proportion of urban older people (15.7%),

than rural, and remote (Both 12. %) had visited a specialist doctor before the survey (X^2 =44.082, p <0.001).

Specialist doctor visits in the past 4 weeks were more common with the presence of diagnosed physical conditions (diabetes, cancer, heart disease) and common mental health conditions (depression and anxiety) across urban, rural, and remote locations. However, the proportion reporting specialist visits among rural and remote older people with physical health conditions and common mental health disorders was lower than that observed in urban locations. For instance, there was a statistically significant difference in specialist consultations in those with heart disease between urban = 25.6%, rural = 21.2%, and remote = 21.5% locations (p <0.001). The geographical distributions of specialist doctor visits with diabetes were urban = 15.2%, rural = 11.9%, and remote = 11.7%. Similar significant differences between urban and remote locations were observed for heart attack (25% vs 15.9%), cancer (23.3% vs 17%), anxiety (21.1% vs 15.7%), and depression (20.4% vs 17.7%) (Table 5.2).

Table 5.2 Health conditions and specialist service use across South Australia

Conditions	Categories	SPC N (%)	Chi-square (p-value)	Urban	Rural	Remote	p-value
Diabetes	No	2432(14.2)	18.895(.001)	1809(15.2)	232(11.9)	391(11.7)	(p< .001)
	Yes	568(17.1)		406 (18.5)	62 (14.3)	100(14.4)	
Heart Disease	Yes	460 (24.4)	158.735(.001)	346(25.6)	43 (21.2)	71 (21.5)	(p< .001)
	No	2544(13.6)		1872(14.7)	251(11.5)	421(11.3)	
Heart Attack	Yes	309(23.1)	82.721(.001)	233(25.1)	36 (23.5)	40 (15.9)	(p< .001)
	No	2695(14.0)		1985(15.1)	258(11.5)	452(11.9)	
Cancer	No	1952(12.5)	231.193(.001)	1426(13.3)	195(10.8)	331(10.7)	(p< .001)
	Yes	1046(21.3)		787(23.3)	98 (16.6)	161(17.0)	
Anxiety	Yes	200(20.1)	24.972(.001)	148(21.1)	25(20.3)	27(15.7)	(p< .001)
	No	2804(14.4)		2070(15.5)	269(11.9)	465(12.00	
Depression	Yes	237 (19.8)	26.804(.001)	171 (20.4)	29 (19.0)	37 (17.7)	(p< .001)
	No	2767(14.3)		2047(15.4)	265(11.8)	455(11.9)	

Mental health treatment	Yes	461(19.2)	44.786(.001)	334(20.1)	46 (15.6)	81 (18.0)	(p< .001)
	No	2537(14.0)		1880(15.2)	246(11.8)	411(11.5)	

Table 5.3 Association between demographic variables, chronic conditions, and specialist doctor visits

	SPC Use	p-value
Gender		
Male	1.0	.331
Female	0.9 (0.8-1.0)	
Age		
60-69	1.0	.001
70-79	1.3 (1.1-1.4)	
>80	1.3 (1.2-1.4)	
Education		
Basic/Primary school	1.0	.001
High School	1.2 (1.0-1.4)	
TAFE/Diploma/Degree	1.5 (1.3-1.9)	
Diabetes		
No	1.0	.001
Yes	1.2 (1.1-1.3)	
Cancer		
No	1.0	.001
Yes	1.8 (1.7-2.0)	
Heart disease		
No	1.0	.001
Yes	1.9 (1.6-2.1)	
Depression		
No	1.0	.001
Yes	1.3 (1.1-1.5)	
Anxiety		
No	1.0	.001
Yes	1.4 (1.1-1.6)	
Rurality		
Urban	1.0	.001
Rural	0.8 (0.7-0.9)	
Remote	0.8 (0.7-0.9)	

Note: Specialist care (SPC)

5.4.2 Association between Demographic Characteristics and Specialist Care Use

Table 5.3 presents the results from the multivariable regression model. Increasing age, higher educational attainment, physical health conditions, and common mental disorders were independently associated with a greater likelihood of using specialists' services. Compared to the urban participants,

rural (OR: 0.8, 95% CI: 0.6-0.9, p= 0.001), and remote (OR:0.8, 95% CI: 0.7-0.9, p= 0.001) older adults were less likely to use specialist doctor services, after adjusting for age, gender, education, and any present health condition.

5.5 Discussion

Our study investigated rural-urban differences in specialist doctor consultations outside of hospital settings for rural older adults to understand the factors associated with specialist care services use based on Andersen's behavioural model of health service use. In this study, the use of specialist care services out of the hospital among older adults was 14.6%. Increasing age, higher educational attainment, diagnosed physical health conditions, and common mental disorders were independently associated with higher specialist care use. There was a significant regional disparity in specialist health services use with older adults in rural locations using fewer specialist services out of the hospital compared to older adults in urban locations.

Specialist medical services are critical to chronic disease management, especially in older adults with complex healthcare needs. Rurality was found to be independently associated with less likelihood of specialist visits. The association between rurality and healthcare service use seems to be affected by specific local dynamics. No differences was observed for specialist gastroenterologist visits between rural and urban adults in Canada (Benchimol et al., 2018). It has been reported that rurality plays an important role in determining the nature and level of health services access, but it does not always translate into access disadvantage (Smith et al., 2008). The rural-urban disparity in specialist doctor visits found in this study buttresses the fact that older people in rural Australia experience poorer access to, and use of, needed specialty services (Australian institute of Health and Welfare, 2019a; Goodridge & Marciniuk, 2016). This result corroborates a similar international study where specialist care utilisation was higher in the Finnish capital- Helsinki than in regional Finland (Suominen-Taipale et al., 2004).

Chronic health conditions including diabetes, cancer, heart disease, heart attack, and mental illness were associated with higher odds of non-hospital specialist doctor visits in our study. Schulz et al. (2020) have highlighted that disease burden tends to explain differences in the use of medical specialist services among older adults in Germany. Of note, older people with a heart attack, for instance, were more likely to visit specialists if they were in an urban area (25.1%) as opposed to a remote community (15.9%). This may reflect the longstanding challenges in accessing specialised services in Australian rural environments (Gruen et al., 2001; Henderson et al., 2018). A greater supply of health services facilitates timely and appropriate service use (Häkkinen, 1991). This result

could also mean two things: First, the underutilisation may be contributing to the higher burden of multimorbidity earlier reported elsewhere (Ofori-Asenso et al., 2019). Second, the lower utilisation is a good thing as it may reflect a broader scope of cost-effective practice by rural generalists saving patients from expensive visits to a specialist.

Consistent with gerontological studies of health services use (Awoke et al., 2017; Falaha et al., 2016; Gong et al., 2016), we found increasing age and higher educational attainment demonstrated associations with specialist doctor visits. Specifically, we found that those who were 70-79 years and 80 years or above were more likely to visit specialist doctors outside the hospital. It is likely that the more frequent visits to specialist doctors among those 70 years and above is due to their higher burden of diseases (Marengoni et al., 2011). Our findings further reinforce the evidence that increasing age is associated with multimorbidity which may ultimately result in higher need for specialty care. Higher education may enable individuals to afford private specialist services due to its association with higher incomes (Suominen-Taipale et al., 2004). According to the 'Rural and Remote Health' report, social determinants such as income and education partly account for health inequalities including access to specialists in rural and remote areas(Australian Institute of Health and Welfare, 2019). The findings of the present study suggest that socio-economic variables such as education and income may better predict specialty care use. This is because older adults with higher educational qualifications were more likely to use specialist services across the study areas.

Our results validate the theoretical constructs of Andersen's behavioural health model. Age and gender (predisposing factors) demonstrated associations with specialists services use. Several published international studies (Shao et al., 2018; Wickramarachchi, Siop, & Perera, 2022) analysing health services use through the behavioural model have made similar conclusions. Similarly, having chronic health conditions (need factors) independently predicted specialist visits. Chronic health conditions have been verified in similar studies as a need variable associated with health services utilisation among older adults (Asante et al., 2022; Shao et al., 2018; Wandera, Kwagala, & Ntozi, 2015). Lastly, rurality and education that were specified under the enabling construct of Andersen's model showed associations with specialists services use. As discussed earlier, education may improve the socioeconomic status of an individual and as well broaden their knowledge base to make health services more accessible to them. Moreover, educated individuals are more conscious of their health and are more likely to use speciality care, all other things being equal (Suominen-Taipale et al., 2004). Conversely, rurality may serve as a barrier to health services due to lower levels of education, limited healthcare resources and the concept of distance decay (McGrail & Humphreys, 2015).

After several years of research and policy efforts, it is worrying to note that rural and remote populations continue to grapple with unmet health services needs (Australian institute of Health and Welfare, 2019a; National Rural Health Alliance, 2017). Gruen and colleagues (2001) argue that most of the illnesses responsible for the rural population's higher morbidity and mortality would ordinarily be managed with greater accessibility to specialist services.

5.6 Limitations

This study is one of the first studies to investigate rural-urban differences in specialist care services use and validates the factors of specialist visits with Andersen's behavioural health model. The results of the study should be interpreted along with some limitations. First, the study used cross-sectional data, and causality cannot be determined. Second, older people accessing specialist services through hospitals are not assessed in this study. Hence, we do not know the overall use of specialist services (e.g., hospital outpatient services). Third, even though, there is information about diagnosed conditions, we do not know anything about the severity of these conditions which have an important impact on the need for health services use. Again, the question used in the SAMSS survey relative to specialists' visits is quite ambiguous. Lastly, the quantitative nature of the study limited us to capturing the normative views of older adults in relation to factors influencing specialist doctor visits. As a result of this, a mixed methods study on non-hospital specialist doctor consultation is warranted.

5.7 Conclusion

We have demonstrated that rural, and remote older adults in South Australia use fewer specialist services than their urban counterparts. This may have contributed to the higher burden of diseases among older people in rural locales. Conversely, the lower use of specialist medical services may indicate cost-effective practice by rural generalists saving older patients expensive visits to specialists. Moreover, limited access to specialist services and lower socioeconomic levels in rural and remote environments could be important drivers of the low utilisation of specialist care. The findings of this study warrant further exploration to improve access to evidence-based specialist care interventions throughout the healthcare system, especially in rural settings.

PROLOGUE TO CHAPTER 6

The findings of the previous studies in this thesis show that (a) chronic physical and mental health conditions are independently associated with general practitioner services use among older adults; however, rather than seeking help from specialised mental health professionals, rural older adults relied more on general practitioners for mental health assistance (Asante, McLachlan, et al., 2022); (b) certain demographic characteristics (e.g., age, female gender, and education) are stronger predictors of health services use; and (c) disparity in the use of specialised care services between rural and urban older populations (Asante et al., under review). These results suggest that interventions designed to enhance the utilisation of specialised services for older people, particularly in rural areas could be efficacious in improving their health outcomes.

The third study of the thesis (viz (Asante, Rio, Stanaway, Worley, & Isaac, 2022) focused on rural environments and investigated the relationships between complex physical health conditions (multimorbidity), psychological distress (mental health problem) and health services utilization. Being the first known rural-centric study of its kind, Kessler's psychological distress scale was used to compute scores for unspecific symptoms of depression and anxiety disorders in older adults (aged 60 years or above) who participated in the SAMSS survey. Furthermore, self-reported healthcare services (general practitioner visits, hospitalisations, and emergency department visits) utilisation for multiple health conditions (two or more ailments in a person) care in the presence of psychological distress were examined.

CHAPTER

6

PSYCHOLOGICAL DISTRESS, MULTIMORBIDITY AND HEALTH SERVICES USE AMONG OLDER ADULTS IN RURAL SOUTH AUSTRALIA

Dennis Asante[1], *Josephien Rio[2]*, *Fiona Stanaway[3,]* *Paul Worley[2]*, and Vivian Isaac[1]

[1]College of Medicine & Public Health, Rural and Remote Health, Flinders University, Renmark, SA, Australia

[2] Riverland Mallee Coorong Local Health Network, SA Health, Government of South Australia

[3]Sydney School of Public Health, Faculty of Medicine and Health, University of Sydney, Sydney Australia

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Summary

Objective: Psychological distress may relate to higher health services use. However, data on psychological distress and health services use among rural older adults are limited. This study investigates psychological distress in older adults (aged ≥60) and evaluates the relationship between psychological distress, multimorbidity and health services utilization.

Design: A cross-sectional design was adopted using data on older adults (≥60) (n=5920) from South Australia's 2013-2017 population health survey. The Modified Monash Model MM2-7 was used to designate rural areas. The dataset provides information on reported physical health conditions, psychological distress, and patterns of health services use. The Kessler Psychological Distress Scale (K10) was used to compute scores for reported mental health disorders in this population.

Results: The mean (SD) age of the study participants was 72.1 (8.1) years. Women constituted 58.8% of the sample. The mean (SD) score for psychological distress was 12.5 (3.6). One-fourth (33.7%) reported one-chronic condition, 20.4% reported 2 chronic conditions and 13% had more than 3 chronic conditions. High psychological distress was associated with female gender (X^2=14.4, p<0.001), <80 years (X^2=11.7, p=0.019, lower education (X^2=10.9, p=0.027). Similarly, multimorbidity was associated with female gender (X^2=51.1, p<001), increasing age (X^2=173.6, p<.001) and lower education (X^2=28.8 p<.001). Psychological distress and multimorbidity were independently associated with health service use. High psychological distress was associated with general practitioner (GP) visits (odds ratio 3.6 (95% CI 2.6-5.1), p<0.001, emergency department (ED) visit (odds ratio 2.5 (95% CI 1.2-5.0), p<0.001) and hospital admission (odds ratio 2.3 (95% CI 1.3-4.3), p<0.001). Multimorbidity was associated with general practitioner (GP) visits (odds ratio 6.8 (95% CI 5.6-8.3), p<0.001, emergency department (ED) visit (odds ratio 2.5 (95% CI 1.4-4.3), p<0.001) and hospital admission (odds ratio 3.1 (95% CI 1.9-5.1), p<0.001). The model included age, gender, education, number of chronic conditions and psychological distress.

Conclusion/implication:

Psychological distress and multimorbidity were independently associated with health services use. Thus, psychological distress, particularly in the presence of multimorbidity, presents an opportunity for intervention by clinicians that may reduce the demand for rural health services.

The Known: Multimorbidity is associated with psychological problems and poor health outcomes. Multimorbidity and high psychological distress increase with age.

The New: Psychological distress is independently associated with higher health services use in rural South Australia. Association between psychological distress and higher services use holds while adjusting for multimorbidity.

The implications: Psychological distress particularly in the presence of multimorbidity, presents an opportunity for intervention by clinicians that may reduce the pressure on rural health services.

6.1 Introduction

Multimorbidity; the coexistence of two or more chronic diseases in an individual is more prevalent in older adults (Fortin et al., 2006; Ofori-Asenso et al., 2019; Xiao et al., 2021). A recent review of multimorbidity in older adults (≥65) in high-income countries reported a 66.1% prevalence estimate (Ofori-Asenso et al., 2019). Approximately, two-thirds (68%) of Australian older adults (≥60 years) reported two or more chronic conditions and the number of co-occurring diseases increased with geographical remoteness (Australian Bureau of Statistics, 2015b). Multimorbidity is associated with poor quality of life and functional capacity, higher mortality rates, increased risk of hospital admissions, and higher health care expenditures (Glynn et al., 2011; Picco et al., 2016). It is also associated with poor mental health, particularly severe psychological distress (Alhussain, Meraya, & Sambamoorthi, 2017; Brown et al., 2014; McPhail, 2016; Scott et al., 2016; Soysal et al., 2017; Swartz & Jantz, 2014). This notwithstanding, the effects of the coexistence of multimorbidity and psychological distress on health services use; especially in rural environments, have not been sufficiently examined (Fortin et al., 2006).

Psychological distress refers to non-specific symptoms of stress, anxiety, and depression and is a widely used indicator of mental health and well-being in population health and ageing surveys (Forcadela et al., 2020). Psychological wellbeing and physical health are intertwined. Older adults living with multimorbidity are more likely to experience higher levels of psychological distress (Hopman et al., 2016; Sfyrkou, 2015; Steptoe et al., 2015). The risk of developing psychological problems is 1.5-4 times higher in multimorbid patients compared to the general population (Zalai et al., 2012). Diabetes, body pains, cardiovascular diseases, abdominal adiposity, and obesity have been related to psychological distress in older adults (Alhussain et al., 2017; Brumby et al., 2012; Hopman

et al., 2016; Stockbridge, Wilson, & Pagán, 2014). Psychological distress is also associated with higher progression rates to severe mental health (e.g. major depression, mixed dementia) conditions (Atkins et al., 2013) and decreased functional ability (Jing et al., 2020). Importantly, psychological distress is a significant predictor of poor quality of life (QOL) and well-being in older people (Kelly et al., 2010).

Rural older adults suffering from multiple chronic conditions have been reported to experience higher rates of psychological distress (Hamano et al., 2020; Ross & Zhang, 2008). Several international studies have observed higher psychological stress in rural and remote settings. For example, a Chinese study reported that older adults residing in rural areas have higher rates of psychological distress than their urban counterparts (Ross & Zhang, 2008). This observation has been confirmed by Zhao and colleagues (2020) where poor sleep quality and severe psychological distress were more prevalent in rural older adults. In a related study, Jing et al. (2020) showed that rural older adults were more likely to experience a higher count of physical morbidities and high psychological distress. Similarly, Hamano et al. (2010) observed a positive association between rurality and psychological distress for older people.

In Australian rural environments, healthcare challenges such as poorer access to health services, inadequate healthcare professionals, particularly specialised care doctors and waiting times for clinical appointments are reported to affect the overall physical and mental well-being of people in rural locales (Lisa Bourke et al., 2010). These healthcare challenges exacerbate for the rural older individuals living with complex chronic conditions who may require multidiscipline care (Asante et al., 2021). This has contributed to rural-urban health differentials where the rural population, especially the older adults report poorer physical and psychological wellbeing (Lisa Bourke et al., 2010). Hence, rural older Australians may be at a higher risk of severe psychological distress due to the higher prevalence of chronic disabilities, lower incomes/financial insecurity, and healthcare challenges in rural areas (National Rural Health Alliance, 2017). An Australian study on mental health and well-being within rural communities in New South Wales (NSW) has reported 16.1% moderate and 4.5% high psychological distress in the older population aged 65 or above (Kelly et al., 2010). Previous studies have reported on the interconnection between physical and psychological health (Scott et al., 2016; Soysal et al., 2017; Swartz & Jantz, 2014). However, the independent influence of high psychological distress and multimorbidity on health service use in Australian rural environments has not been previously studied.

The long-term impact of untreated psychological distress in older cohorts with chronic multimorbidity could exacerbate their health outcomes leading to higher health services use, and early

stay in nursing homes (de Mendonça Lima & Ivbijaro, 2013; Ohrnberger, Fichera, & Sutton, 2017). Investigating the prevalence and risk factors of psychological distress in older adults is a huge leap towards the determination of resources investment for clinical and policy interventions (Amare et al., 2020). Understanding the prevalence of comorbid physical and psychological distress conditions in older adults will help provide data on needs and service gaps which may inform mental health services provision in nonurban settings. Further, the insights from this study may help to partly contribute towards the realisation of Sustainable Development Goal 3, target 3 (SDG3) which seeks to ensure health and well-being for all without recourse to age, race, and location of residence by 2030 (United Nation, 2020). To this end, this study employed a population-based survey of older South Australians in regional locations to investigate the prevalence of psychological distress in older adults (aged ≥60) and to evaluate the relationship between psychological distress, multimorbidity and health service utilisation in rural South Australia.

6.2 Materials and Methods

6.2.1 Survey Design and Research Sample

A cross-sectional survey data were obtained from South Australia's 2013-2017 population health Department database. The South Australian Monitoring and Surveillance System (SAMSS) is an epidemiological survey administered monthly by the South Australian government through the Department of Health and Aging (Campostrini et al., 2019). Every household listed in the Electronic White Pages (EWP) in south Australia is eligible for inclusion in the sample (Avery et al., 2004). Of note, the survey sought verbal consent from the participants. Every year, approximately 7000 South Australians are interviewed. The survey adopts a dual over-lapping recruitment method (mobile phone 70%; landline 30%) through random digit dialling (Campostrini et al., 2019). SAMSS is purposefully designed to recruit a more representative sample from the various geographical locations in the state. South Australians who have access to a telephone or mobile phone are randomly selected to participate in this survey. The survey's response rate was 69%. (Campostrini et al., 2019).

The survey considers the trends of diseases condition, barriers to healthcare utilisation and other health services use challenges that are determined by the state's department of health as important for South Australia (Campostrini et al., 2019). The purpose of the Government health survey is to address the healthcare needs of the growing population in South Australia to assist in policy decisions (Avery, Dal Grande, Taylor, & Gill, 2004). The survey monitors both state and national health priority areas to know and evaluate the effectiveness of and/or need for health policy review. In this context, the data provide relevant retrospective population health information for monitoring health status and attending to the population changes and aiding formulation and implementation as well as assessment

of health programs. The survey was carried out by professional interviewers in the English Language for approximately 15-20 minutes using a computer Assisted Interview (CATI). The CATI system ensures prompt entry of data from the interviewer's questionnaire to the computerized database. This system is highly rated for its ability to capture high-quality data on rural and regional locales where the cost of administering face-to-face interviews in previous surveys has led to underrepresentation (Eckert et al., 2004). Details information about the aims, methods and initial reports of the survey have been reported elsewhere (Avery et al., 2004).

The dataset analysed in the current study provides information on the proportions of respondents who reported physical health conditions, comorbidity, psychological distress symptoms, and patterns of health services use. The Kessler Psychological Distress Scale (K10) was used to compute scores for reported psychological health disorders in this population. The Kessler Psychological Distress Scale (K10) is a 10-item measure designed to assess nonspecific psychological distress in epidemiologic surveys (Kessler et al., 1994; Mewton et al., 2016).

6.2.2 Geographical Classification

We distinguished between urban and rural areas based on the Modified Monash Model (MMM) of geographical taxonomy. The modified Monash Model classification system is prepared by the Australia Department of Health, using remoteness and population data from the Australian Bureau of Statistics (Drovandi & Woolley, 2020). The model measures remoteness and population size on a scale of MM1 to MM7 (MMM, 2012). The model was used to represent urban MM1, and rural MM2-MM7 based on their population size and remoteness from capital cities and services.

6.2.3 Study Sample

The current study analysed a subsample of respondents aged 60 years and older rural South Australians (n=6435); Modified Monash Model MM2-7. To achieve the primary objectives of the study, data on respondents with diagnosed mental health conditions such as depression, anxiety or receiving mental health treatment and incomplete data (n=515) were excluded from the analysis. Excluding individuals with diagnosed mental health conditions make sense to isolate the impact of psychological distress (unspecific symptoms of mental disorders) on healthcare use.

6.2.4 Ethics Approval

Approval for the study and use of the data was granted by the South Australia Department for Health and Wellbeing Human Research Ethics Committee: HREC/18/SAH/89.

6.2.5 Measures

6.2.5.1 Outcome Variables

The use of formal health services was the primary outcome of interest. This was operationalised as having utilised at least one of the following health services: general practice (GP) visitation, hospitalisation, and emergency department (ED)/service use.

6.2.5.2 GP Visitation

In the survey, participants indicated the number of times they visited GPs for health care consultations in the past 12 months. Based on the responses, we measured GP consultations through a two-categorical scale: <6 (low GP visits, and ≥ 6 (high GP visits) to enhance a distinction between high and low frequency of GP visits (Xiao et al., 2021). It is worth noting that these classifications of health services use were adapted from similar studies (Dempsey et al., 2003; Eckert et al., 2004) on patterns of health services utilisation.

6.2.5.3 Hospitalisations

Using the previous four weeks as the referent period, interviewees were reported whether they ever spent at least a night in a health care facility/hospital for any health condition. Hospitalisation was measured as a dichotomous variable indicating “hospital admission= yes” or “no hospital admissions =no” in the past month preceding the survey.

6.2.5.4 Emergency Department/Service Use

Similar to the assessment of hospitalisation, respondents were asked to report if they ever visited or were taken to any emergency department within the past four weeks prior to the interview for any emergency health condition. Emergency department visits were measured as a dichotomous variable with “yes” indicating the use of at least one emergency service, and “no” signifying never used any emergency department service in the past month preceding the survey.

6.2.6 Explanatory Variables

6.2.6.1 Sociodemographic Variables:

Survey respondents were categorized into three age groups including 60-69, 70-79, and 80 or above years; gender and highest formal educational attainment were included in the analyses. These characteristics of the sample are depicted in Table 6.1.

6.2.6.2 Psychological Distress.

In the SAMSS survey, participants are made to indicate any nonspecific psychological distress experienced in the past 30 days prior to the interview. This was measured through the self-report K10 scale. The scale consists of 10 items about individuals' level of nervousness, agitation, psychological fatigue and depressing on a 5-point scale with scores ranging from 10 to 50; higher scores indicate heightened levels of psychological distress (Anderson et al., 2013). Extant literature has indicated a score of >15 to signify moderate to severe psychological distress and ≥20 signifies a higher likelihood of a mental disorder (Anderson et al., 2013; Forcadela et al., 2020; Kilkkinen et al., 2007). Following the National Health Survey (2015), high psychological distress was taken as a score of ≥22 (out of the maximum score of 50) in this analysis.

6.2.6.3 Multimorbidity:

This health condition is defined as the coexistence of two or more chronic conditions in an individual (Bähler, Huber, Brüngger, & Reich, 2015; Boyd & Fortin, 2010; McPhail, 2016; Pefoyo et al., 2015). Multimorbidity is common among older adults and is associated with high costs and gaps in quality of care (Pefoyo et al., 2015). In this analysis, multimorbidity was measured as suffering from three or more chronic conditions over the past 12 months prior to the survey. Given participants' responses, multimorbidity was evaluated through four categorical dimensions including "none" (no chronic health condition), "one" (only one chronic condition), "two" (two comorbid chronic conditions), and "≥3" (three or more chronic health conditions).

6.3 Data analysis

Data on older individuals (≥60) between 2013-2017 were considered for this analysis. Prior to the data analysis, initial screening was conducted to remove missing data. The total sample size for this investigation was 5920 survey participants. The statistical analysis followed the following steps: Descriptive statistics using frequencies and percentages were used to describe the sociodemographic and baseline characteristics of the participants. The chi-square test, or Fisher's exact test when appropriate, was used to evaluate the differences in the prevalence of chronic health conditions. Multivariate logistic regression models were used to explore the effects of multimorbidity and psychological distress on health services use after controlling for age, gender, and educational attainment. All statistical analyses were performed using the Statistical Package for Social Science (SPSS) software version 24.0 (IBM Corp., Armonk, New York, USA) and statistical significance was defined at a value of $p < 0.05$.

6.4 Results

As shown in Table 1, a total of 5920 older adults aged 60 or over were analysed. Two-fifth of the participants were between 60-69 years (43.1%), while 80 years and above constituted 19.9% of the sample. The mean age of the participants was 71.2 years, and more than half (58.7%) were females. The majority (57%) of the participants had completed high school; 10% (primary education), and 32.8% (diploma or tertiary degree). More than two-thirds (69%) reported one or more chronic conditions; 20.4% reported two or more chronic diseases, and 13.0% reported three or more diseases (767) (Table 6.1).

Table 6.1 Demographic characteristics

Demographics	N	%
Age (years)		
60-69	2554	43.1
70-79	2190	37.0
>80	1176	19.9
Gender		
Female	3478	58.7
Male	2442	41.3
Education		
Basic	594	10.0
High	3372	57.0
Diploma/degree	1944	32.8
Number of chronic conditions		
None	1821	30.8
One	1996	33.7
Two	1206	20.4
>3	767	13.0

6.4.1 Prevalence of Psychological Distress

The mean (SD) score for psychological distress measured using Kessler's scale was 12.5 (3.6). The prevalence of psychological distress by gender is presented in Figure 6.1 and Table 6.2. Females had statistically significantly higher levels of psychological distress than males with moderate; 11.6% against 8.9%, and high; 3.3% compared to 2.5%, respectively. The oldest old (≥80-year group) had significantly lower rates of high psychological distress than the other age groups where prevalence was similar at 3.4 % (Table 6.1).

The prevalence of high psychological distress in those with a degree certificate or diploma (2.6%) or high school (3.2%) was lower compared to those with basic school education (3.6%). All the recorded differences were statistically significant at p= ≤ 0.05.

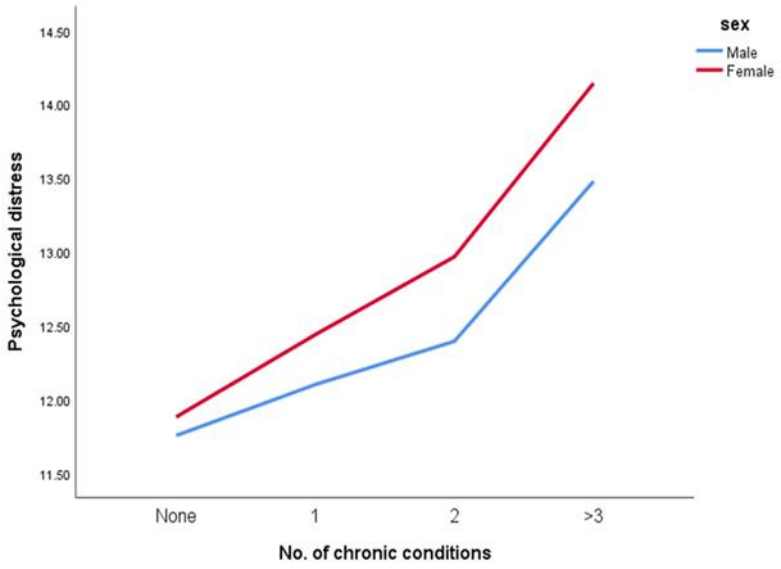

Figure 6.1 Association between psychological distress and multimorbidity

Table 6.2 Factors associated with psychological distress measured using Kessler's scale

Factors	Mean (SD)	F/T	(p-value)	Low (%)	Moderate (%)	High (%)	Chi-square (p-value)
Sex							
Male	12.2 (3.4)	-4.7	<0.001	2127 (88.6)	214 (8.9)	61 (2.5)	14.4 (0.001)
Female	12.6 (3.6)			2905 (85.1)	395 (11.6)	114 (3.3)	
Age (years)							
60-69	12.6 (3.8)	4.9	0.007	2163 (85.8)	272 (10.8)	85 (3.4)	
70-79	12.5 (3.6)			1865 (86.4)	221 (10.2)	73 (3.4)	11.7 (0.019)
>80	12.2 (2.9)			1004 (88.3)	116 (10.2)	17 (1.5)	
Education							
Basic	12.9 (3.8)	7.1	0.001	480 (82.9)	78 (13.5)	21 (3.6)	
High	12.5 (3.6)			2854 (86.2)	351 (10.6)	105 (3.2)	10.9 (0.027)
TAFE/Diploma/Degree	12.3 (3.5)			1690 (88.1)	180 (9.4)	49 (2.6)	
Number of chronic conditions							
None	11.8 (2.9)	67.0	<0.001	1643 (91.4)	123 (6.8)	32 (1.8)	127.7(<0.001)
One	12.3 (3.4)			1734 (88.2)	179 (9.1)	52 (2.6)	
Two	12.7 (3.5)			985 (83.5)	155 (13.1)	39 (3.3)	
Three or more	13.9 (4.7)			569 (76.0)	131 (17.5)	49 (6.5)	
Health Service Use							
GP Use							
<6	11.9 (2.8)	206.6	<0.001	3291 (90.3)	297 (8.1)	57 (1.6)	134.5(<0.001)
>6	13.3 (4.4)			1670 (80.1)	302 (14.5)	114 (5.5)	
Emergency visit (past 4 weeks)							
No	12.4 (3.5)	27.8	<0.001	4931 (86.8)	585 (10.3)	166 (2.9)	15.5 (<0.001)
Yes	14.0 (4.7)			101 (75.4)	24 (17.9)	9 (6.7)	

Hospitalisation (past 4 weeks)							
No	12.4 (3.5)	37.2	<0.001	4890 (86.9)	573 (10.2)	163 (2.9)	23.7 (<0.001)
Yes	14.0 (4.6)			142 (74.7)	36 (18.9)	12 (6.3)	

Note: GP = General practitioner; SD = standard deviation

Multimorbidity was more common among females (>3 chronic conditions); which was 15.5% compared to 10.% among male participants (X^2=51.3, p<0.001). Increasing age was associated with multimorbidity. The prevalence of 3 or more chronic conditions was 9.2%, 15.2% and 18.4% for 60-69, 70-79 and >80 years respectively (X^2=173.6, p<001). The results also indicated a higher prevalence of multimorbidity among those with lower education levels. The prevalence of 3 or more conditions was 11.9 for those with a university education compared to 13.7% and 15.5% for those with high school and basic education respectively.

6.4.2 Psychological Distress, Multimorbidity and Health Services Use

Moderate-high psychological distress was significantly most common in those living with comorbid conditions (19.4%) and multimorbid/three or more chronic conditions (24%) compared to participants with only one chronic health condition (11.7%). Moderate-high psychological distress was associated with higher health services use. Approximately 20% of the study sample with moderate-high psychological distress reported high GP visits (≥6 visits). The proportion of older adults with moderate-high psychological distress who reported emergency department visitation(s) was 24.6%. Hospital admissions followed a similar pattern where the proportions of hospitalised older adults with symptoms of moderate to high psychological distress were much greater than hospital admission(s) reported for those with lower symptoms of psychological distress.

In the multivariate logistic regression models (Table 6.3), the independent effect of psychological distress and health services use was investigated. There was no gender association with health services use. Respondents aged 80 years or above were more than twice as likely to use high GP services (OR, 2.6, 95% CI, 2.2-3.1); ED presentation (OR, 2.0, 95% CI, 1.2-3.2) and hospitalisation (OR, 1.6, 95% CI, 1.1-2.3) compared to the 60-69 age group. The odds of health service use with multimorbidity (≥3 chronic conditions) were high GP use (OR, 6.8, 95% CI, 5.6-8.3); ED presentation (OR, 2.5, 95% CI, 1.4-4.3); and hospitalisation (OR, 3.1, 95% CI, 1.9-5.1) compared to older people who reported no comorbidities. Individuals who had high psychological distress were also more likely to report high GP use (OR, 3.6, 95% CI, 2.6-5.1); ED presentation (OR, 2.5, 95% CI, 1.2-5.0) and hospitalization (OR, 2.3, 95% CI, 1.3-4.3). The model included age, gender, education, number of chronic conditions and psychological distress.

Table 6.3. Multivariate analyses on the association between psychological distress and health service use

	High GP Use	ED Presentation	Hospitalisation
Gender			
Male	1.0	1.0	1.0
Female	0.9 (0.8-1.0)	1.1 (0.7-1.6)	0.8 (0.6-1.1)
Age (years)			
60-69	1.0	1.0	
70-79	1.7 (1.5-2.0)	1.7 (1.1-2.5)	1.3 (0.9-1.9)
>80	2.6 (2.2-3.1)	2.0 (1.2-3.2)	1.6 (1.1-2.3)
Education			
Basic	1.0	1.0	1.0
High School	0.8 (0.6-1.0)	0.9 (0.5-1.6)	1.2 (0.7-1.9)
TAFE/Diploma/Degree	0.7 (0.5-0.8)	0.9 (0.5-1.7)	1.0 (0.6-1.7)
Number of chronic conditions			
None	1.0	1.0	1.0
One	2.0 (1.7-2.4)	1.3 (0.7-2.1)	2.1 (1.3-3.2)
Two	3.8 (3.2-4.5)	2.0 (1.2-3.4)	2.5 (1.5-4.0)
Three or more	6.8 (5.6-8.3)	2.5 (1.4-4.3)	3.1 (1.9-5.1)
Psychological distress			
Low	1.0	1.0	1.0
Moderate	1.7 (1.4-2.0)	1.9 (1.2-2.9)	2.0 (1.3-2.9)
High	3.6 (2.6-5.1)	2.5 (1.2-5.0)	2.3 (1.3-4.3)

Note: GP = General practitioner; ED = Emergency department

6.5 Discussion

We aimed to investigate the prevalence of psychological distress in community-dwelling older adults (without a diagnosis of mental health problems) and to evaluate the relationship between psychological distress, multimorbidity and health service utilisation in rural South Australia. Applying the K10 scale, we found that a significant proportion (13%) of the rural population studied reported moderate to high psychological distress. Psychological distress was higher in females and lower in the oldest old (≥80 years). Again, psychological distress increased with multimorbidity where older adults with a higher number of chronic conditions report higher levels of psychological distress. Multimorbidity and psychological distress were independently associated with higher rural health service use.

The prevalence of high psychological distress (3.3%) in rural older adults observed in this study is relatively low compared to the rates that have been reported previously. In 2013, Phongsavan and colleagues observed a 4.9% prevalence of high psychological distress in older Australians aged 65–74 years. They also reported a 5.3% high psychological distress rate for older participants within the age group 75-84 years (Phongsavan et al., 2013). Similarly, Kelly et. al (2010) reported a 4.5%

incidence of high psychological distress among rural older adults (65+) in New South Wales. These studies did not exclude people with pre-existing mental health problems possibly accounting for slightly higher prevalence than reported in our study. Further, in our study, nearly 70% of the sample had chronic comorbidities with 20% having three or more chronic conditions. This is consistent with a systematic review of Australian studies which reported high (80%) chronic conditions in older adults (Gillian et al., 2008). The increasing prevalence of high morbidity in older adults is attributed to both behavioural and biological factors (McPhail, 2016). On the behavioural dimension, physical inactivity, smoking and alcoholism and other lifestyle-related variables have been discussed (Willis et al., 2012).

In our study of rural older adults, increasing age, female gender and increasing co-morbidities were associated with high psychological distress. These results are consistent with existing studies in similar economies such as the US (Alhussain et al., 2017) and Canada (Fortin et al., 2006) where older people with multiple chronic health illnesses are reported to suffer serious psychological distress. Females have been reported to have a higher likelihood to experience high psychological distress and depressive symptoms (Forcadela et al., 2020; Australian Bureau of Statistics, 2018; Victorian Population Health Survey, 2005; Alhussain et al., 2017; Atkins et al., 2013; Zalai et al., 2012). However, the gender difference observed in this study was moderate. We also found an association between the increasing number of co-morbidities and psychological distress in our rural cohort.

Psychological distress in older multimorbid patients can often be left unattended in rural clinical settings (Sartorious, 2013). This may be because physical healthcare is normally prioritised over mental care for older adults in clinical settings, but also older adults find it difficult to differentiate between psychological symptoms and emotional changes in daily life. They consider psychological stress as a natural concomitant with ageing, and hence, rarely see the need for professional mental health assistance. This assertion has been confirmed in an Australian study where 50% of older adults (60+) with non-dementing mental health conditions report that their symptoms of depression and anxiety were normal ageing symptoms (Wuthrich & Frei, 2015). Further, people with moderate psychological distress are reported to rarely seek help due to stigma and sometimes unawareness of services, or both, a common phenomenon in rural environments (Klap, Unroe, & Unützer, 2003). Additionally, the limited specialist workforce in rural areas may constitute further challenges in rural environments. There is limited professional training in specialised psychiatric diagnosis for GPs and other general health professionals (e.g., nurses) to distinguish between distress accompanied with physical illness (e.g., cancer) and psychological distress. Hence, health professionals in rural settings may miss out on or underestimate mental distress that might be present in their older patients

(Kuswanto, Stafford, Sharp, & Schofield, 2018; Ryan et al., 2005; Zabora et al., 2001). Psychological distress sometimes hides in plain sight, and non-psychiatric clinicians may lack the competence to recognise them in older adults (Jonathan, 2015).

The significant impact of multimorbidity and psychological distress on health service use was quite evident in our study. Increased coexistence of chronic diseases and high psychological distress was associated with high GP service use, frequent ED visits and hospitalisations. These associations were independent of demographic characteristics. These results are consistent with several empirical studies previously reported on the predictive power of clinical and psychosocial factors of health services use (Alhussain et al., 2017; Andersen, 1995; Hopman et al., 2016; Stockbridge et al., 2014). Multimorbidity has been linked with higher primary care visits, hospital admissions and emergency presentations (Chan et al., 2002; Chu & Pei, 1999; Condelius et al., 2008; Zulman et al., 2015). For instance, in the US, Schneider, O'Donnell, and Dean (2009) report that older adults with three or more chronic conditions utilised 25 times more hospital bed-days and 14.6 times higher hospitalisations than those without any chronic diseases. This pattern of associations between multimorbidity and health services utilisation has been consistent and extensively reported across a range of public health studies (Chan et al., 2002; Condelius et al., 2008; McPhail, 2016; Zulman et al., 2015). The reported impact of multimorbidity and hospitalisation is also consistent with observations of high numbers of emergency visits among people with increased chronic diseases (Chu & Pei, 1999; Graves et al., 2009; Zulman et al., 2015). Adding to the literature, our study found psychological distress in older adults in rural locales is independently associated with higher health resources utilisation. The striking difference observed in this analysis for older adults with similar disease profiles, but different levels of psychological distress and health-seeking patterns suggests that the underlying psychological distress must also be prioritised in clinical settings. Importantly, poor psychological well-being adversely affects physical health outcomes (Brumby et al., 2011).

Comorbid physical and mental health conditions have been reported previously in Australian literature (Brumby et al., 2011; McPhail, 2016) and similar countries with ageing profiles and health systems such as the UK (Caroline Bahler et al., 2015; Soley-Bori et al., 2021), USA (Schneider et al., 2009), and Canada (Pefoyo et al., 2015; Romans, Cohen, & Forte, 2011) to be associated with high health resources uptake, poor health outcomes, and higher health care cost. However, our findings suggest that psychological distress may lead to high health services use and cost. This is because untreated psychological distress can adversely impact physical health outcomes, and ultimately higher resources need to manage poor health conditions . It is, therefore, noteworthy to recognise that the impact of psychological distress and multimorbidity on health care expenditure and resource utilisation transcends government funding and insurers of the healthcare system to older individuals

who directly faced out-of-pocket expenditures associated with their health services use (Hwang et al., 2001; Rogowski, Lillard, & Kington, 1997; Schoenberg et al., 2007). This implies that early screening/diagnoses and treatment of psychological distress co-occurring with chronic physical conditions in older adults will have a significant impact on patterns of health services use and reduce the cost burden of healthcare on both older individuals and the state. It is important to emphasis that screening exercise when not properly carried out may result in unintended consequences such as stigmatisation. Hence, effective integration or collaborative care system where GPs and mental health professionals pay attention to symptoms of psychological distress among older adults in rural clinical environments is appropriate.

6.6 Conclusion and Limitations

This population-based study of community-dwelling older adults in rural South Australia showed that psychological distress poses a critical challenge to chronic disease management and health outcomes for older adults. Older adults with a higher count of chronic illnesses experienced higher levels of psychological distress, and each was independently associated with high health care resource utilisation. This has crucial clinical and public health policy implications for planning interventions to address the comorbid emotional and mental health needs of chronic disease older patients in rural clinical settings. Therefore, the results of this study can serve as evidence for further investigations and baseline resource allocation to solve the complex healthcare needs of older adults in rural localities. Moreover, this in a way would help to partly achieve SDG3 target 4 which focuses on reducing chronic non-communicable ailments and improving mental health and wellbeing. Future studies are needed to explore optimal strategies and cost-effective mechanisms for addressing the complex health care needs of older patients with multiple chronic conditions and mental health issues in rural health care systems.

The following factors should be considered when interpreting the results of this study. First, the study is cross-sectional in nature and the causality between psychological distress, multimorbidity and health services use cannot be inferred. There is plausible reverse causality. Thus, repeated use of health services may elevate psychological distress due to challenges accessing healthcare needs in rural environments. Nevertheless, irrespective of the direction of the causality, psychological distress and multimorbidity are critical factors in the health outcomes of the rural older population. Again, the dataset analysed here reflects a representative sample of the SAMSS survey data and may not be reflective or generalizable to other States in Australia, where characteristics of rural communities such as population density and accessibility of health resources may differ. Also, psychological distress was defined by K10 scores computed from self-reported symptoms. Using a measure of

symptom severity rather than a diagnostic scale may have some components of reporting bias. Moreover, the categorization of some of the responses may have blurred some information in our data. However, our findings are comparable to national survey reports and other literature on the subject, indicating that potential response bias has but a negligible effect on the study results.

PROLOGUE TO CHAPTER 7

The quantitative studies in this thesis have demonstrated associations between chronic physical and mental health problems, sociodemographic characteristics, and health services utilisation among older adults. The results largely point to a disparity in the use of specialised healthcare services between rural and urban older populations suggesting that certain crucial needs such as care for psychogeriatric problems in the presence of multiple chronic health conditions and chronic management services went unmet in local rural health facilities.

To comprehensively understand specific unmet care needs and highlight reasons behind the identified factors associated with older adults' use or otherwise of needed services, the final study of the thesis (vis., (Asante, McLachlan, Pickles, & Isaac, 2023) qualitatively explored unmet care needs, barriers to, and enablers of health services utilisation from the perspectives of older adults and their rural-centric care providers. Moreover, the views on how rural healthcare challenges could be solved were investigated.

CHAPTER

7

UNDERSTANDING UNMET CARE NEEDS OF RURAL OLDER ADULTS WITH CHRONIC HEALTH CONDITIONS: A QUALITATIVE STUDY

Dennis Asante[1], Craig S. McLachlan[2], David Pickles, and Vivian Isaac[1]

[1]College of Medicine & Public Health, Rural and Remote Health, Flinders University, Renmark, SA, Australia

[2]*College of Nursing and Health Sciences, Flinders University, Renmark SA, Australia*

[3]Health Vertical, Centre for Healthy Futures, Torrens University, Sydney, NSW, Australia

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DA contributed 70%, CSM 5%, DP 5% and VI 20% to the research design, data analysis, and writing and editing of the manuscript, respectively.

Summary

Background Rural populations experience poorer access to the necessary health services for chronic health conditions. Although studies of rural healthcare access continue to expand, most are based on quantitative data, yet normative views and lived experiences of rural adults might offer a better understanding of healthcare access and their specific unmet needs. This qualitative study sought the views of both rural-centric older people and healthcare professionals to understand health needs, barriers, and enablers of accessing health services, with a focus on chronic health condition(s). ***Methods***: Between April and July 2022, separate in-depth interviews were conducted with 20 older people (≥60 years) in a rural South Australian community. Additionally, focus group interviews were conducted with 15 healthcare professionals involved in providing health services to older adults. Transcripts were coded using the NVivo software and data were thematically analysed.
Results: Participants described a range of unmet care needs including chronic disease management, specialist care, psychological distress, and the need for formal care services. Four barriers to meeting care needs were identified: Workforce shortages, a lack of continuity of care, self-transportation, and long waiting times for appointments. Self-efficacy, social support, and positive provider attitudes were the crucial enabling factors of service use among rural ageing populations.

Discussion: Older adults confront four broad ranges of unmet needs: chronic disease management care, specialist care, psychological care, and formal care. Many access barriers emerged to have contributed to the unmet care needs, however, some potential facilitators could be leveraged to improve healthcare services access for older adults.

7.1 Introduction

The global population is increasingly ageing at an unprecedented rate (World Health Organisation, 2015; Rutherford & Socio, 2012). Older adults (≥60 years) constituted 16.5% of Australia's population in 2020, and this age cohort is estimated to reach 23% by 2066 (Wilson, 2019). The ageing process is associated with an elevated risk of multiple chronic health conditions (Kingston et al., 2018; Ofori-Asenso et al., 2019), hence older people have a higher need for chronic management services (e.g., palliative care, complex diabetes care, cancer management, and cardiovascular diseases care), specialist services (e.g., dental services, outpatient diagnostic, or therapeutic care), and services for mental and psychological distress that usually coexist with chronic physical conditions (e.g., symptoms of depression, anxiety, and emotional discomfort). Older adults with complex chronic conditions in rural Australia may require assistance with personal hygiene, medication compliance, food preparation, and community engagement (formal care). The associations between ageing

multimorbidity, and functional decline have been found to become worse with geographical remoteness (Asante, Rio, et al., 2022; Ofori-Asenso et al., 2019).

Older people living in Australia's rural areas are considered vulnerable for several reasons. Rural communities have limited access to medical specialist services. Depending on the size of the community, there may be limited health infrastructure, limiting acute and chronic medical care for the diagnosis and management of complex diseases (Cai & Lalani, 2022). Rural older Australians experience higher rates of complex multimorbid health conditions than their urban counterparts (van Gaans & Dent, 2018). Furthermore, people in rural communities confront severe physical barriers, including the absence of public transport, long waiting times, and long distances to health centres, especially speciality appointments (Muir-Cochrane et al., 2014). The extended waiting times for appointments, higher rates of provider turnover, and inadequate access to speciality care and chronic disease management services in Australia's rural locales adversely impact the health and health outcomes of older people in rural environments (Henderson et al., 2018).

Surprisingly, few research projects have investigated the healthcare needs and service provision challenges of rural older people in Australia (Mariño et al., 2014; Muir-Cochrane et al., 2014; van Gaans & Dent, 2018). For instance, exploring mental health service barriers for rural older people in Australia, Muir-Cochrane, and O'Kane (2014) interviewed 19 healthcare providers and reported two broad access barriers, namely, poor recognition of mental health problems and limited-service availability. Similarly, Henderson et al. (2018) found the fragmentation of governmental responsibility, funding regime, and centralisation and standardisation of service delivery as critical barriers in rural areas from the perspective of care providers. Mariño, Khan et al (2014) studied patterns and factors of dental-care service use among older adults in rural Victoria. This cross-sectional study reported the existence of barriers such as cost, the length of the waiting list, and service availability to oral care. Indeed, most gerontological studies have adopted quantitative designs that may not be sufficient in capturing the lived experiences of rural older people and/or have underrepresented rural populations. Other international studies have demonstrated poorer access to health services among rural older people, which may be attributed to the higher burden of diseases reported in rural older adults (Ford et al., 2018; Wang et al., 2015). Again, research examining need perceptions, barriers to care, and enablers of service use for complex chronicity in rural environments through the perspectives of both providers and older patients is limited. Accordingly, a more focused understanding of health needs and barriers to accessing healthcare in rural areas from the perspective of older people and health professionals is required for policy and practice.

It is not clearly understood how rural older adults perceive their access to healthcare, particularly during the period of COVID, and how this has affected barriers to needed services, their coping strategies, and their preferred policy directions to meeting their health needs. To comprehensively understand the needs and barriers to care services, the views and lived experiences of older people and their service providers would provide valuable insight. Such information may help in the cross-validation of common concerns or themes and offer an opportunity to identify any discrepancies in perceptions about care delivery. Moreover, the views of health service providers are crucial because the quality of services ultimately depends on them (Ford et al., 2018). Therefore, we draw on qualitative interviews with rurally living older adults in South Australia (≥60 years) and local healthcare professionals to understand the health needs of rural older adults and barriers to accessing the needed healthcare. Hence, the study aimed to understand the perceptions of unmet health needs and barriers to healthcare across older adults and health service providers in rural South Australia. We also assessed their views on interventions believed to make services more accessible and responsive to the needs of older adults.

To determine this, the following specific questions served as a guide to the study.

a) What are the perceived unmet healthcare needs of community-dwelling older adults in rural South Australia?
b) What are the challenges to care access and facilitators of health service utilisation among rural older adults?

7.2 Theoretical Consideration for Healthcare Needs and Services Utilisation by Rural Older Adults

This study is guided by Andersen's model of health services utilisation. This behavioural model of health service use was originally proposed in 1968 but has undergone stages of revisions (Andersen, 1995; 2008). The model allows analysis of contextual factors that interact to shape health-seeking behaviours. Central in this framework is that an individual's use of health services balances on three functional domains including predisposing factors, enabling factors, and need factors (Andersen, 2008). Predisposing factors may include age, sex, race, occupation, and health beliefs (Bradley et al., 2002). Enabling factors are conditions that make health ser-vice resources obtainable to the individual and may comprise family and community re-sources, residential location, income, health literacy, and social capital (Andersen, 1995; 2008). Need fac-tors are based on the principle that a person must perceive illness and a need for help be-fore using health services (Andersen, 2008). Due to its robustness and flexibility for contextual analysis, several studies have applied Andersen's model in

health services research (Amente & Kebede, 2016; Awoke et al., 2017; Kim & Lee, 2016; Paduch et al., 2017).

Employing Andersen's model, Wandera and Kwagala (2015) demonstrated the effectiveness of the model in predicting health services use among older adults. In their study, need variables such as severity of diseases and mobility limitations were found to demonstrate the strongest association with health services use compared to income and social support (enabling factors), and age, sex, and education (predisposing characteristics). Evashwick et al. (1984) adopted the model to examine health services utilisation among older adults in the United States and found that need factors (e.g., diagnosed health conditions and perceived health status) were important predictors of physician visits, hospitalisations, and ambulatory care services use. Again, Weller, Minkovitz, and Anderson (2003) demonstrated that enabling factors (e.g., the type of health insurance and financial status) were associated with health services use. Similar conclusions have been drawn by Rivara et al. (2007) in a sample of American women. In this study, need factors were more highly associated with health services use than the other constructs of Andersen's model.

Based on the reviewed literature and the initial findings of this thesis, we assume in this current study that needs factors (complex chronic conditions) and the enabling/barriers (services availability, accessibility, social support, and provider attitudes) would shape health services uptake by rural older adults living with chronicity(s).

7.3 Research Design, Setting, and Methods.

Qualitative studies can capture comprehensive information about beliefs, perceptions, and the lived experiences of a population of interest (Patton, 2014). These qualitative data were gathered as part of a mixed-methods study exploring ageing and co-morbid physical and mental healthcare needs in rural and remote South Australia (SA). SA is a regional State with a population of 1.8 million people of which approximately one-quarter of the residents live in nonurban areas. It is one of the fastest ageing states in Australia with a median age of 41 years, higher than the national median age of 38 years (Australian Bureau of Statistics, 2022). The median age in SA's urban areas (39.3 years) is seven years younger than in its rural and remote areas (46.4 years) (Australian Bureau of Statistics, 2021).

Due to ethical and confidential requirements, in-depth interviews were conducted with older people. On the part of care providers, three focus groups discussions were organised to capture group dynamics and synergy, real-time feedback, and instant reactions. Prior to any data collection activity, written informed consent was obtained. The Riverland region has an increasingly older population, particularly individuals who are 60 years and over (Riverland Community Wellbeing Report, 2019). Approximately, 35,000 people live in the region's major towns (Renmark, Berri, Loxton, Barmera,

Monash, and Waikerie) and many minor townships. This region fell under Riverland Mallee Coorong Local Health Network (RMCLHN) at the time of data collection. The RMCLHN manages the delivery of public hospital services and other community-based health services as determined by the state government (Government of South Australia/SA Health, 2022). Specialist health services are delivered to older people by local health teams with acute inpatient care and other medical procedures available from the state capital, Adelaide. The decision to conduct individual interviews with older adults rather than a group setting was based on the ethical consideration of safeguarding participants' health information (privacy issues). Since this study gathered information on chronic health conditions, it was not ethically approved for the disclosure of private health information to anyone except to only the research team members.

7.3.1 Research Team and Reflexivity

Interviews were conducted by the lead author (D.A.) who is a doctoral student, and the group discussions were moderated by the last author (V.I.), the project supervisor. Co-authors (C.S.M.) and (D.P.) provided critical clinical support during data analysis and interpretation. It is important to note that none of the study participants had prior relationships with the researchers.

7.3.2 Participants

We used a purposive sampling strategy to gather a range of opinions that were then used to recruit participants to determine differences and similarities in experiences, perceptions, and beliefs (Jaramillo, Haozous, & Willging, 2022; Suri, 2011). The participants included 20 older adults and 15 healthcare service providers. To recruit older adults, the first author sought permission from relevant organisational leaders where required and attended meetings and social gatherings (e.g., Rotary meetings, Zonta meetings, and church services) with study flyers and information sheets to invite attendees to participate. Here, we approached community leaders with the project objectives, who then discussed the study with older people and directed those interested to the researchers for further briefing and recruitment. Eligible participants were 60 years or older with a self-reported chronic health condition(s) and who had used health service(s) in rural SA. Additionally, an individual had to live in a rural SA community but not in any institutionalised facility and must have a cognitive capacity to participate before been recruited to participate in this study. The study focused on community-dwelling older adults since institutionalised older adults have their care services organised by their host institutions. Hence, they do not usually experience the challenges of interest in this study.

A range of professionals was invited to participate in the study. The sample included generalists, nurses, mental health professionals, and social workers. We reached out to candidates via email with information sheets. Moreover, the first author (DA) visited hospitals and medical centres and distributed flyers and information sheets in care facilities. Two general medical practitioners, two mental health nurses, four general nurses, and seven social workers agreed to participate.

7.3.3 Data Collection

Older adults were interviewed by D.A. and V.I. in English between April and July 2022. Demographic data including age, health status, driving status (able to drive a car or not), and living arrangement (whether living alone or with relatives/friends) were taken. This data was taken to enable examination of any differences in needs and support mechanisms across the demographic characteristics. Subsequently, a semi-structured interview guide was followed with a series of open-ended questions about health needs, experiences and perceptions of health services access, challenges, facilitators including factors shaping their help-seeking and care, and opinions on how their care can be improved. Typically, the interviews lasted between 30 and 45 in the participants' agreed-upon convenient environment.

Three focus groups interview were conducted with health professionals at different periods. Two of the groups discussions were virtually conducted via Teams software (version 1.6.00.1381) with author V.I. as the moderator. The third and final focus group interview was moderated by D.A, and this was conducted face-to-faced with two GPs in a medical centre. All focus discussions began with open-ended questions about participants' work roles and responsibilities, professional backgrounds and working experiences with providing care to older adults. Their views on the health needs of their older clients and access issues were sought. Also, participants' opinions and recommendations for improving access to services. The groups interviews lasted between 45-60 min. Of note, all interviews and/or discussions were digitally recorded and professionally transcribed for analysis.

7.3.4 Data Analysis

Two research team members (D.A. and V.I) analysed the transcripts through a thematic framework using the behavioural model (Boeije, 2009; Braun & Clarke, 2006; Braun, Clarke, & Hayfield, 2022; Clarke & Braun, 2013). A systematic multistage technique, namely, (a) familiarisation, (b) identifying key concepts, (c) indexing, (d) charting and mapping, and (e) interpretation, was employed for the analysis (Braun & Clarke, 2006, 2021; Clarke & Braun, 2013).

During the familiarisation stage, D.A and V.I. reviewed the transcripts to grasp the content of the data. Using Andersen's model of health services utilisation as our theoretical framework, codes were developed through both deductive and inductive processes (Bradley, Curry, & Devers, 2007). Predetermined codes based on the topic list for the interviews and review of the relevant theoretical constructs formed the basis of the development of initial codes (deductive approach). Here, need concepts such as diagnostic services, chronic management, and care for unspecific symptoms of depression and anxiety were coded. Self-transportation, inadequate professionals, access to specialists, etc. (barriers), provider behaviours, and help from relatives (facilitators) were coded. Additional concepts from the data were coded after iterative engagements (inductive approach). Investigator meetings were held during the coding process and, where required, the initial coding framework was modified through consensus.

In the indexing phase, a line-by-line examination of the data to match the codes was conducted by the researchers. Memos were used to annotate coders' decisions and questions about the content of the transcripts and reflections on the analysis. Regular discussions were held on the annotations for the consistency of coding. The charting and mapping process involved organising similar codes into themes and comparing emerging themes between older adults and health professionals. At this stage, we matched health professionals' codes with identified themes from older adults' transcripts when appropriate. Patterns and themes from both data sources (responses from older adults and health professionals) were compared for discrepancies and/or validation.

In the interpretation stage, major themes and typical quotes were identified to summarise the findings. We shared the results with participants for confirmation, and no disagreement emerged on the findings. NVivo (version less or 2020 edition) software was used to aid in the qualitative analysis.

7.3.5 Ethics Approval

Ethics approval was granted by the Flinders University Human Research Ethics Committee (Project No: 4647). A written participant consent form assuring the anonymity of volunteers' identities was signed by all participants. Participants were offered a shopping voucher valued at AUD$ 20 for their involvement in the study.

7.4 Results

7.4.1 Characteristics of Participants

We included 35 participants, with 20 older adults self-reporting chronic health condition(s) and 15 healthcare professionals. Among the older adults, the mean age was 63.65 (range 60-87) years, 11

were women, 5 could not drive, and only 3 were living alone. Most of the healthcare personnel in this study were social care workers (n= 7), mental health nurses (n= 2), general nurses (n= 4), and general practitioners (n= 2) (Table 7.1).

Table 7.1. Participants characteristics

Characteristics		
	Older Adults (N = 20)	Healthcare Providers (N = 15)
Mean age (years)	63.65	25–35 = 9, 36–46 = 4, 47–57 = 2
Age range	60–87	
Sex	Male = 9 Female = 11	Male = 5 Female = 10
Professional background	-	General practitioners = 2 Mental health Nurses = 2 Social Workers = 7 General Nurses = 4

7.4.2 Summary of Major Themes

Based on the primary objective of this study, the findings from our data have been categorised into three prominent headings, namely, unmet health needs, access to healthcare services, and facilitators/enablers of health services utilisation. Unmet health needs comprised chronic disease management, specialist care services, psychological distress, and formal caregiving. Access challenges included workforce shortage, continuity of care, transportation and waiting time for an appointment. Facilitators involved health self-efficacy, social support, and positive attitude of service providers. Table 7.2 highlights the main themes, subdomains, and examples of corresponding quotes. A description of each finding and its related subthemes as well as any differences between patients' and healthcare professionals' perspectives.

Table 7.2 Unmet health needs, access challenges, and facilitators to health services utilisation.

Themes	**Patient Quote**	**Provider Quote**
Unmet needs		
Chronic disease management	"I have type 2 diabetes, lupus and stage 4 lung and brain cancer…..Every three weeks for four treatments and then after that it's every three weeks for 24 treatments, which I'm trying to have up here in Berri, I hope." (70-year-old woman) Because the dollar return per minute on a short consult is higher than the dollar return per minute on a long consult. So, they want more of the short consults because it raises more money, and I thought, what's the object of the practice of medicine here? Is it to raise more money, hence we want shorter appointments, or is it to provide a level of care that's	"The other thing with chronic conditions, people with chronic conditions need, I think they need the doctor to go the extra mile to do all their preventative care unrelated to their other conditions as well." (GP 1 male, 36–46 years) "Often, almost everyone's got a shopping list of six to eight things for 15 min, which means two minutes a problem with a quick hello as well. So, you've got less than two minutes a problem." (GP 1 male, 36–46 years)

	going to meet the need of the patient? (75-year-old man)	"I think yeah for a medical clinic or any medical service to be successful in providing good chronic disease care, both physical and mental health issues, the whole clinic or the whole service needs to be working together and on the same page. There's no point… We've seen it. There's no point where the doctors will be doing one thing, the receptionist will be doing another thing, and the nurses will be doing one thing"
Specialist care services	"The obvious other one is access to the level of medical care that you need. My heart condition has required operations and stents and all sorts of things which—that's a specialist care field and you've got to go to Adelaide to access that. So, there's something about the level of medical care not being accessible locally but I don't think we've got the population to justify everything for everyone. We do need to understand that's one of the costs of living in the country." (64-year-old man) "It's seeing specialists, because you've got to travel down to Adelaide. That's over 200—about 200 and something kilometres, and organising all of that." (65-year-old woman)	"if we can keep the physical and emotional health quite good with the lack of specialists and lack of other health care up here, it's a huge win for people." (GP 2 male, 25-35 years) "I've had a recent situation with someone in a regional town. They needed a significant amount of support and the doctor said well you need to put your wife into aged care, and you need to move to the city so you can get the support that you need." (social worker)
Psychological distress	"I think there was a depression associated with that that wasn't treated at the time. Now, I've got ongoing management of those, which is both a combination of local and Adelaide-based treatments." (Man in his 60 s). "I used to worry so much about things but that made me sick so you learn how to just—I don't know, just—you've got to cope, somehow you cope. I suppose at 65, you don't worry about the little stuff so much. Because the main thing at this age is your health." (Woman in her 60 s) "I haven't considered that the anxiety has been long lived. It just might be because of a situation that's arisen. Then we can resolve it within a very short period of time." (70-year-old man)	"Yeah, we just don't have the time to do a DASS-21 or a DASS-42 or something like that. The nurses in some of the health assessments will do a geriatric depression scale, or mini-mental state exam or something like that because they get given 45 min. But for a standard GP consult in 15 min, there are normally so many medical conditions, acute and chronic. Even if it's just a chronic disease consultation, that person always brings in some acute problems as well." (GP 2 male, 25-35 years) "time is a huge one, usually for proper consultant for mental health, you often need at least 20, 30 min, and that's doing it fairly superficially, and not doing a great deal more." (GP 1)
Formal caregiving	"There's just things around the home that I'm looking at whether I can get support with those. That's with things like the bathroom cleaning and general cleaning……Now, with something like cooking tea, my back can be tight by the time I finish cooking tea, and yeah, so I'm just seeing if I qualify for anything. Otherwise, we'll get somebody in to just clean periodically and do drop-ins once a month" (Man in his 70s).	"I also see that somewhere, we need to put in personal care, because when we—people need to shower, they need to look after their skin integrity. Older people become incontinent; how do we manage that?" (Social worker) "Talking from a perspective of community services under Commonwealth Home Support Program, the basic care needs commence with domestic assistance and social support, respite for the carer, shopping assistance for those very basic needs which become the first they become evident when people are wanting to stay at home and their physical health, whether it be through chronic condition or issues of ageing, prevents them from doing those activities themselves for the long-term." (Community health nurse)
Access challenges		
Workforce shortages	"Doctors—the hours of our medical staff—our healthcare providers generally, the hours that they're working are ridiculous. I don't understand how they can operate safely. If you put that degree of work	"But then just one of the big ones it's just access, because there's just not enough general practitioners to cope with the load. There's not enough psychiatrists, not enough people in mental

	pressure onto other professions, they would fold. If we made our air traffic controllers work like our doctors, we'd have planes crashing often. So, I just think we expect too much of our doctors and why? Because we haven't got enough of them. We need more doctors." (Woman in her 70 s). "There is certainly not enough doctors in this place. That's the simple truth of it." (80-year-old woman).	health teams, there's not enough psychologists, not enough counsellors like access is difficult." (GP 2 male, 25-35 years) "I think it comes down a lot to, once again, there's a staff shortage. We don't have enough support workers. Certainly, when I listen to the support workers and they'll talk about their workload. Some of them now are only finishing at six o'clock at night, because that's what they need to do because there's not enough workers to provide the services that are required" (nurse)
Continuity of care	"I've only been here for years myself, so I haven't got what I would call a regular doctor." (73-year-old man) "What I want is I want one doctor—just one—who doesn't have to be the world's best doctor but I want them to know about me. I don't want every time I go to the doctor to have to explain this and this and this and they get on the computer and they—oh yes, I see." (Man in his 60 s) "It's the change of doctors you have all the time. It's all right if you have the same doctor, because when you have different doctors, I don't think they should read your notes." (65-year-old woman).	"Well, I think since we've started doing the chronic disease management a lot better and a lot more structured, you get better. You can stave off a lot of chronic diseases worsening by just dealing with them regularly, which is just been a major change that we've done, going from ad hoc appointments to some structured follow up the physical side are actually seeing a lot better health outcomes for our patients." (GP 2 male, 25-35 years) "So, yeah, I'd agree that if you're doing good, if you've got good continuity of care, you can normally pick up when someone's mental health has dropped off. Even if we see them four times a year, it's enough."
Transportation	"I'm not allowed to drive at the moment due to the brain cancers. I only drive locally anyway, so if I need to go to Berri or further, I need to get friends to take me." (Woman in her 70s) I possibly could but I probably don't feel confident to drive after I've had the injection in the eye.	"We have a lot of people with significant issues that just can't leave home, either physically or emotionally, which is huge, up here as well, because you've been three hours away from Adelaide. Where if your health is terrible, you're a long way from a tertiary centre and you just can't access certain things." (GP 1) "As people get older, they're not confident driving long distances, they often have to go to Adelaide for medical appointments, or to Port Pirie, and transport becomes a big thing. They can't get onto a bus, there's no bus services available." (Social worker)
Waiting time for an appointment	" if you need to go see a podiatrist or you need to go see a dietitian, the waiting lists are long, so long. Sometimes I've been—you have specialists that come up to the Riverland and a lot of the times, they'll recommend you; it's easier to—and quicker if you just go to Adelaide to see them, rather than waiting to get something up here." (Woman in her 70 s). "You have to wait a fair while to see a specialist, like I see an eye specialist and it's pretty hard. I book three or four months in advance for an annual appointment." (73-year-old woman)	"The role that I'm in now, which is supporting people with ongoing chronic conditions, sometimes they might have five chronic conditions at the same time, including rare genetic disorders. If people had assistance earlier, the outcomes could be a lot better than what I'm seeing every day in my work. Just the massive barriers for people actually getting access to the services that they do need." (Nurse) "Then in terms of visiting specialists, there's often long waits to get into them for these more complicated conditions." (GP 2 male, 25-35 years)
Facilitators		
Self-efficacy	"Well the physical things—I do lots of physical exercise and try and keep myself very fit. I do Pilates, I walk, I do aerobics—so I've been trying to fix my body myself, yeah. When I need to see a doctor, I go for an appointment." (61-year-old woman). I've been involved in a number of health programs, reaching out for the community. Stress management, stop smoking programs. One time, weight loss and because of my awareness of—it's the importance of	"I'm relatively new into the health space, I've only been here 12 months, and I still don't feel confident in navigating certain parts of it. I'm coming from an educated background, with the ability to advocate for myself if I need it. A lot of the clients that I see, actually don't have that." (Social worker) "The people who are proactive often get a better outcome because they're prepared to take responsibility for their own needs, and they're

	maintaining good health, I think that's sort of helpful in my situation. It keeps me focused that if there's something that I feel is not right, I like to get it checked out. (72-year-old man)	prepared to ask for help. Their prepared to find out what needs to be done." (Nurse)
Social support	"They are accessible but because of the glaucoma I'm having injections in one eye and I have a brother in Berri who will come and get me and take me home again. Also, a brother-in-law who will come and get me and take me home." (78-year-old woman)	"Family support is also wonderful, but a lot of people in Port Pirie—and Mel will attest to this—they go into hospital, they don't even have someone who can feed their cat or go and get them a bag of clothing because they just don't have a support network." (Social worker)
Positive service provider attitude	"I've been quite happy with the reception of the nurses and the reception staff because they're very polite [here]. Even at Berri they're quite good too, the specialist." (Woman in her 70s)	"sometimes, we—depending on risk, we might need to transport ourselves. So we don't promote that, but we talk about it as a team and if we need to do it, we will do it….. Again, not really our business, but we can't sort of ignore that so we then reopen another referral and help them navigate that whole process" (Social worker)

7.5 Unmet Needs

Older adults' self-reported (chronic) health condition(s) including heart diseases, cancer, diabetes, sleep apnoea, asthma, glaucoma, depression, bipolar, arthritis, and osteoporosis. Chronic health conditions require a structured and well-coordinated management plan to prevent health decline and the onset of new conditions (Kroenke et al., 2023). Interestingly, our data highlighted many interrelated factors showing an association between reduced chronic disease management and a decline in physical activity and an increase in common mental health disorders. Both older people and health professionals emphasized on the need for care.

7.5.1 Chronic Disease Management.

Participants described healthcare challenges including a limited interprofessional coordination, unstructured chronic disease management plan, data transfer/sharing, and limited consulting time. Both patients and providers mentioned that the typical period of consulting which ranges from 15 mins to 20 mins is not enough for dealing with multimorbid conditions and screening for any new onset health condition or worsening of pre-existing conditions. A general medical practitioner indicated that … '*Often, almost everyone's got a shopping list of six to eight things for 15 min, which means two minutes a problem with a quick hello as well. So, you've got less than two minutes a problem*' (GP1, male, 36–46 years). Older adults were more concerned about the handling of their health data records. They raised issues with the norm of carrying their health records around any time they visited new practitioners or facilities. One older patient in his 70s noted:

'*I do think record keeping on my health could be better. My personal record is up here, but it should be instantly available to all doctors anywhere. But the way that the medical record is kept, it seems, from just sitting in the patient's seat, that it's a lot of chronological stuff and it's far too much stuff for a doctor to take in at the time that he is with you, you've got the appointment to go through, deal with it and get out type thing. I think the structure and the way that the data is kept in terms of the database for my medical record could be improved to make it simpler for a doctor to horne in on exactly what he's trying to see based on what he's thinking might be the problem with this patient.'* (Older participant 7, male)

Interprofessional coordination and a structured chronic disease management plan were primarily discussed by health professionals as the only effective and efficient way of managing the chronic conditions of older people. There was a perception that a lack of coordination and a structured management plan affects the provision of needed services to a wider coverage of older adults. A senior generalist practitioner had this to share: '*Everyone's doing something different, no one's working together with a clear plan of how the system or service is supposed to be working. So, certainly, we inherited a very broken system. It takes a lot of effort to try and get everybody all on the same page with it. That includes, so even just in between doctors, doctors will want to do their own sort of thing. Where we're at after five or six years of playing around with it, the only way we can make it work and make it work really well is to make sure we're super, super organised.'* (GP2, male, 25-35 years)

7.5.2 Specialist Care Services

Most of the older people reported that accessing speciality care meant waiting for specialists to come from urban Adelaide or making a long trip to tertiary care centres located in Adelaide. Older people expressed being concerned about the long trips for some specialist care. Those unable to drive long distances rely on relatives to access speciality services. Specialist appointments were considered very difficult to secure by the study participants. Except for life-threatening emergencies, patients wait several weeks for appointments, a situation that health professionals feared could lead to the deterioration of chronic conditions, the onset of new conditions, and rapid functional decline due to delayed treatment. One participant stated:

'*Then in terms of visiting specialists, there are often long waits to get into them for these more complicated conditions, if the specialist even comes up to the area as well and being three hours away from Adelaide, often people don't want to travel, or they can't afford to travel or they're too sick to travel. If they can't get into the specialist, we end up doing the care which is quite complex and complicated.'* (GP1, male, 36-46 years)

'*My heart condition has required operations and stents and all sorts of things which – that's a specialist care field and you've got to go to Adelaide to access that. If I go to make an appointment, they say, oh well, it's six weeks. In six weeks, the problem's either a lot worse or it's gone away.'* (64-year-old man, participant 5).

7.5.3 Psychological Distress

More than half of older adults reported two or more health conditions and most of these people discussed psychological distress associated with their physical condition. There was a perception among older people that psychological distress and other psychological challenges that might be coexisting with their chronic conditions do not capture the attention of doctors as much as their physical conditions. A 75-year-old cancer patient shared her experience of untreated depressive symptoms that coexisted with her physical condition *'... Interestingly, I think there was a depression associated with that wasn't treated at the time. Now, I've got ongoing management ...'* (Participant 11). The GPs also described their awareness of distresses that normally coexist with multimorbid physical health conditions in older people. *'We see a lot more chronic depression and anxiety around poor health conditions.'* (GP2). This is an indication that GPs are not oblivious of the associations between psychological distress associated with chronic conditions in older adults. However, time limitation doesn't allow for screening and treatment unless there are manifestations of severe symptoms:

'*Yeah, we just don't have the time to do a DASS-21 or a DASS-42 or something like that. The nurses in some of the health assessments will do a geriatric depression scale, or mini-mental state exam or something like that because they get given 45 minutes. But for a standard GP consult in 15 minutes, there's normally so many medical conditions, acute and chronic. Even if it's just a chronic disease consultation, that person always brings in some acute problems as well.'* (GP1)

Healthcare providers also discussed the complexities of the health system as a source of mental stress to older adults. As a mental health nurse put it: *'it's not just the access, but it's that ongoing navigation of our health system. you've got most - a lot of people have more than one chronic illness. They'll have two or three. They'll have a combo of things that trying to get all those specialists or people working together and I know you have GP management plans and things like that, but seriously, they're not helping a client coordinate their care and sorting out drug interactions or what - you know, one specialist will start on this and then another specialist will start on that and the client doesn't know where they're at with all their medications and things like that. It's not like - I really*

do find the GP is not coordinating all that by any means when it comes to their chronic conditions.' (Participant 22_Mental health nurse, male, 36-46 years)

Some older adults did not consider symptoms of depression and emotional distress as medical conditions requiring formal assistance but rather as normal symptoms of ageing. Most older people are not able to distinguish between daily emotional changes and distresses associated with their physical health conditions. There was also the perception that emotional changes are natural concomitant with the ageing process, hence no need to seek help for natural ageing process.

7.5.4 Formal Caregiving

Older adults discussed the need for support in carrying out activities of daily living. For instance, participants frequently mentioned needing domestic assistance (e.g., cleaning, cooking, gardening). They also described the need for help to do grocery shopping and access certain public places. Older adults indicated a preference to receive help from formal support networks or organisations. Health professionals, particularly social workers and nurses added personal care (bathing, laundry, hair grooming), transport and assistance with medication. As one social worker put it:
'*We need to put in personal care because when we - people need to shower, they need to look after their skin integrity. Older people become incontinent; how do we manage that? So somewhere in there, I'd like to see personal care and transport put in*.' (Participant 26, female, Social worker, 25-35 years)

7.6 Challenges to Healthcare Access.

From our discussions with the participants, four categories of barriers to health services access were constructed from the data: workforce shortages, continuity of care, transportation, and difficulty scheduling appointments/long waiting times. Of note, patients described their challenges accessing health services as well as difficulties they believed their peers also faced.

7.6.1 Workforce Shortages

Participants were focused on the limited number of healthcare practitioners in their localities and linked this phenomenon to unbearable workload (on providers) and limited consulting time and/or limited healthcare supply. Discussion about the inadequate number of health professionals included difficulty attracting GPs, specialists, nurses, and other care providers to rural communities. According to the participants, workforce shortages were largely a result of limited job and educational opportunities for relatives of the providers in rural areas. One man in his 80s said, '*They are obviously*

overworked and tired. Not enough of them, too many of us. Too many patients, and not enough doctors. They need to do something to entice them [providers] to the country. Why wouldn't you want to live here? It's beautiful, isn't it?' Another 65-year-old woman could not see any solution to the problem, "*I guess if there were more doctors, that would ease some pressure but no, I can't see any easy fix or short-term solution. There's just a lot of people who need to see a doctor and yeah, it just makes the doctors very busy.'* (Participant 3).

Many older adults find the high healthcare professional turnover rate in their communities very problematic. However, they believed limited opportunities in rural locales are to blame for the situation, as one woman indicated, '*Once they do their thing up here, next minute, they're gone. But then I suppose, too, a lot of them, their—once their children get to a certain age, the better schools are down that way, where the kids [that] go to university, so they tend to move*." (Participant 12). In discussing staff shortages, a social worker had this to say, "*I think it comes down a lot too, once again, there's a staff shortage. We don't have enough support workers. There are very few allied health disciplines within Port Pirie*.' (Participant 27).

7.6.2 Continuity of Care

The lack of continuity of care was discussed as one of the critical barriers to required healthcare. Continuity of care was interrelated with workforce shortages such that attracting and maintaining enough providers in the rural areas was discussed as the effective way to ensure care continuity. Two main issues arose under continuity of care, namely, irregular or unstructured appointments and a lack of regular doctors or widespread provider turnover. Older people wanted to see a particular doctor for a longer period to build trust and for the doctor to know them and their conditions well. This, they believed, will ensure the continuity of patient care, minimise medical errors, and promote the efficient use of limited consulting time. One man shared his frustration, '*What I want is I want one doctor—just one—who doesn't have to be the world's best doctor, but I want them to know about me. I don't want every time I go to the doctor to have to explain this and this and this and they get on the computer and they—oh yes, I see.*' (Participant 19, Man in his 60s). In the words of a 70-year-old woman, not being able to see her regular doctor has resulted in a medical error that she must live with. An excerpt from her account is as follows:

'Very hard to see the GP that you want to see. I had to see a registrar when my voice went strange and he told me it was laryngitis and it was lung cancer. So I was a bit annoyed but we all make mistakes, don't we? So what can you do? That's the only thing, the doctors are obviously overworked. When you get a doctor that is your doctor, you want to see them all the time. Sometimes you can't. So that's the only issue, but everyone else has the same issue. If it's just for a script you'll see whomever you can get into, but it's nice to see your doctor who knows you. Because he knows me he would have

known that I'd lost a bit of weight and he knew as soon as he saw me in the supermarket that something was wrong. So if I'd seen him, maybe things would have been a bit different, but who knows?' (Participant 9).

There was a perception among older adults that new providers normally do not have enough time to abreast themselves of the conditions of patients … *Yeah, like the man with my voice. Maybe if he'd read a bit more of my history, he would have been a little bit more thorough.*

On the part of health professionals, continuity of care promotes physical and mental well-being outcomes. As a generalist put it *... if you've got good continuity of care, you can normally pick up when someone's mental health has dropped off. Even if we see them four times a year, it's enough.* (GP1).

7.6.3 Transportation

Issues of transportation featured significantly in the interviews. Primarily, transportation barriers included limited public buses, travelling out of town for speciality appointments, the inability to drive longer distances, parking problems in the city, and limited medical transportation programs. Many older adults reported they travel long distances to urban areas for health services that went unmet in their communities, particularly for specialists' consultations. One man commented, '*My heart condition has required operations and stents and all sorts of things which—that's a specialist care field and you've got to go to Adelaide to access that.*'(participant 5). One woman indicated that without assistance from friends and relatives to drive her, she may not be able to attend her appointments as she did not feel confident to drive, especially after medication *... I possibly could but I probably don't feel confident to drive after I've had the injection in the eye.*' (Participant 8, 72-year-old woman). Similar sentiments were shared by the health professionals. They described transportation as one of the frequent reasons older people cited for missed appointments. '*As people get older, they're not confident driving long distances, they often have to go to Adelaide for medical appointments, or to Port Pirie, and transport becomes a big thing. They can't get onto a bus, there's no bus services available…..oftentimes, they miss appointments because of this' (Participant 17, Social worker)*

7.6.4 Waiting Time for Appointments

Older people expressed dissatisfaction with waiting too long to have access to physicians. One woman said, *"to see a specialist, like I see an eye specialist and it's pretty hard. I book three or four months in advance for an annual appointment."* (Participant 20, 73-year-old woman). The waiting time

varied for different services (e.g., to see a GP vs specialist) and communities. One woman said, "*I think it's disgraceful. I don't know what the answer is but if you need to see a doctor, you should not have to wait four to six weeks to see the doctor of your choice necessarily I don't think."* (Participant16, 71-year-old woman).

Even on the day of the appointment, patients are sometimes made to wait several hours before they get to see a doctor, a situation according to them, is very stressful to bear given their health conditions and age. A male participant commented, *'like when we go to the doctor's, they are busy and sometimes we've had to wait an hour even though our appointment was at 11 o'clock, we haven't been able to see the doctor until noon. Then when we see the doctor, we've waited an hour and then after five minutes, we're finished.'* (Participant 2). Health providers agreed that getting access to doctors, particularly specialists is sometimes difficult. This is exemplified in the words of a generalist practitioner, *'Then in terms of visiting specialists, there are often long waits to get into them for these more complicated conditions.'* (GP1).

7.7 Facilitators of Health Services Utilisation

Despite the challenges of accessing health services, most older adults we interviewed described three broad factors including self-efficacy, social support, and positive attitudes toward health services providers that help them to navigate the healthcare system to access their healthcare needs.

7.7.1 Health Self-efficacy

Older adults who described themselves as more assertive, hopeful, and aware of the benefits of healthy behaviours and asked questions about their conditions and treatment options reported that they always feel encouraged to seek help whenever needed. As a 72-year-old man said when asked to share factors that facilitate access to needed services:

'*I've been involved in several health programs, reaching out to the community. Stress management, stop smoking programs. One time, weight loss and because of my awareness of—it's the importance of maintaining good health, I think that's sort of helpful in my situation. It keeps me focused that if there's something that I feel is not right, I like to get it checked out.*' (Participant 12)

Another woman shared, ' *I've never been frightened to actually ask something or get them to explain something if there's—yep.*' (Participant 1, 65-year-old woman).

Healthcare providers reported that older people who are more proactive and confident in asking questions tended to make regular appointments and follow-ups to improve their conditions. As a nurse discussed, ' *The people who are proactive often get a better outcome because they're prepared to*

take responsibility for their own needs, and they're prepared to ask for help. Their prepared to find out what needs to be done.' (Participant 27). This finding is very concerning given the potential for unintended negative consequences for older adults considered to have low self-efficacy. Particularly, older people with severe psychological distress may be more secluded and may not readily be open to discuss their feelings or ask questions. Providers are, therefore, encouraged to pay attention to such older individuals as much as those considered as proactive.

7.7.2 Social Support

Getting help from friends and relatives to attend out-of-town appointments including speciality care appointments in Adelaide, encouragement, and financial support from relatives, according to older adults, were very crucial in meeting their healthcare needs. As exemplified in the words of a woman in her 70s, '*I haven't got a car, so they're [her children] driving around everywhere. I just tell them straight out, I say you drive. So that's it, they take me there.*' (Participant 13). On the other hand, older people with an inadequate social support network sometimes delayed their treatment or lost out on their medications. A 65-year-old woman commented, '*Sometimes if you go down to Adelaide and you need to stay there, those are just extra costs and that - and then also getting medication is an extra cost. Sometimes, I don't even get my medication because I can't afford it*.' When asked whether she could receive support from friends and relatives, she responded, '*No, because they're in the same boat*.' (Participant 4).

7.7.3 Positive Attitudes of Service Providers

Even though older people discussed various struggles in accessing healthcare services, most spoke highly of their healthcare providers. Their primary concern had to do with the lack of a long-term, trustworthy relationship due to the regular change in doctors. However, older adults generally reported satisfaction with their providers. In discussing their experiences with health services providers, older people frequently used phrases such as '*they're accommodating*', '*they're respectful*', '*they're polite.*', '*they're quite good.*', '*they're doing their best.*', and '*quite pleased*'. The professional conduct and positive behavioural disposition of care providers, according to some older people, encourage them to use the needed services. In response to the question 'what is your experience with the healthcare system and providers?' one man submitted:

'*I think they're doing a—I value the doctors who own the practice, I value their experience. If I can, I'll see them.*' (Participant 1, 66-year-old man).

Healthcare providers sometimes went beyond their responsibilities to help older patients to prevent conditions from worsening. They noted that such decisions were normally made based on risk assessment and in strict consideration of professional ethics. A social worker described a typical case: '*sometimes, we—depending on risk, we might need to transport* [patients] *ourselves …. Again, not our business, but we can't sort of ignore that, so we then reopen another referral and help them navigate that whole process*' (Participant 23, Social worker).

7.8 Suggested Interventions to Address Access Barriers.

In our interviews with the participants, we sought their opinions on interventions or programs they believed can help reduce the barriers to health services delivery and access. Although both healthcare providers and older people proffered solutions that targeted workforce shortages more broadly including recruiting and training more locals, attracting professionals from abroad, and instituting incentive packages for rural practice, healthcare providers further suggested the need for structural changes in the healthcare system.

'*We've got to attract them to the country, and we've got to retain them in the country…If you're a doctor in the country, you've got an additional cost associated with educating your kids, if you want them to be privately educated, and accessing additional training is all much more difficult if you're a doctor in the country. So, I think the answer is to recruit more doctors to the country*' (Participant 13)

'*We've got to consider other options……why can't we attract doctors from abroad? we've had different—doctors from different countries in our local town and we've found them to be just as good as the Australian doctors*' (Participant 7)

'*I think yeah for a medical clinic or any medical service to be successful in providing good chronic disease care, both physical and mental health issues, the whole clinic or the whole service needs to be working together and on the same page. There's no point… We've seen it. There's no point where the doctors will be doing one thing, the receptionist will be doing another thing, and the nurses will be doing one thing. Everyone's doing something different, no one's working together with a clear plan of how the system or service is supposed to be working. So, certainly, we inherited a very broken system*' (GP 2).

7.9 Discussion

We conducted a qualitative study with older adults with chronic health conditions and healthcare providers in rural areas to understand their perceptions of needs. The data highlighted four interrelated unmet care needs: (a) Chronic disease management, (b) specialist care, (c) psychological distress, and (d) formal caregiving. Participants discussed four major barriers to health services including workforce shortages, the continuity of care, transportation, and waiting times for appointments. These challenges are partly mitigated through health-related self-efficacy, social support, and the provider's positive attitudes. Andersen's health services utilisation framework (Andersen, 1995) provides useful insight into understanding the access to and use of needed care services (see below). Our study provides valuable insight into how service provision to older rural people could be improved to meet their expected needs, particularly in those with complex diseases or two or more chronic conditions. Both respondent groups discussed suggestions believed to improve health services delivery and access for older adults. Overall, the findings highlight the critical gaps and opportunities for a geriatric care model for rural older adults with chronic health conditions.

This work builds on prior literature on older people's experiences with rural healthcare systems in accessing health services. As reported in earlier studies (Henderson et al., 2014; Jaramillo et al., 2022; Miao et al., 2021; Muir-Cochrane et al., 2014), this study shows that older adults with chronic health condition(s) require a range of healthcare services that remain to be addressed in rural and remote areas. It has been reported that 'rural areas have significant gaps in the continuum of care since community-based long-term care services are often unavailable' (Goins et al., 2005). The study have highlighted the need for improved chronic disease management and addressing of psychological distress and better access to speciality care for complex multimorbid conditions that older individuals in rural environments are prone to experience (Asante, Rio, et al., 2022; Jacobs, Gallagher, & Heydt, 2019; Ofori-Asenso et al., 2019). This finding adds to a similar Australian qualitative study, which reported unmet speciality care needs of rural and remote older adults (Henderson et al., 2014). However, our data also show additional domains of service gaps such as formal care and untreated psychological distress that are critical to the health and well-being of older people. While this study recruited both older adults and providers to understand their perspectives of health needs and barriers to accessing services, the earlier study (Henderson et al., 2014) only reported data on provider perspectives; a possible reason for the discrepancy in the findings. This study, therefore, highlights the need to prioritise psychological distress and formal care services for rural older people with complex chronic conditions.

The unmet care needs of rurally living older adults have been a longstanding public health concern in many parts of the globe, and this phenomenon is attributed to exacerbating barriers to healthcare services in rural locales (Goins et al., 2005; Gong et al., 2016; Jaramillo et al., 2022; Miao et al., 2021; Suntai, Won, & Noh, 2020; Suntai, Won, & Noh, 2021). Access barriers such as workforce shortage and provider turnover are common challenges in rural health systems (Winterton et al., 2016). Workforce shortage and provider turnover are related to the problems of continuity of care and long waiting times for appointments in this study. Therefore, attracting and maintaining adequate rural health practitioners will significantly reduce the long wait times and lack of continuity of care. Older adults build trust and are more confident with providers they have seen for a reasonable period (Jaramillo et al., 2022). As rural older adults rarely discuss their mental health issues, this suggests that designing more effective interventions through their regular GPs present an opportunity to improve their utilisation of mental health services. Shorter periods of employment for care providers and long wait times may impact older adults (across multiple domains including physical health and psychological wellbeing) who are likely to require frequent and complex health services as they age (Goins et al., 2005; Jaramillo et al., 2022).

An important care need identified by participants that have not attracted enough research attention within the population studied was formal care. Participants reported that chronic health and formal care needs were addressed as separate issues for older adults, with a limited understanding of how these are interrelated. Available studies on the unmet care needs of rural older adults have reported mental health services (Henderson et al., 2014; Muir-Cochrane et al., 2014), chronic health management services (Alananzeh et al., 2019), and speciality diagnostic services (Hopley, Horsburgh, & Peri, 2009). According to the study participants, especially the care providers, complex chronic conditions may impact older people's ability to effectively adhere to routine medications, personal hygiene activities, food preparation and proper dieting. This may, in turn, impact the health and well-being of older people. This suggests that an integrated care model that incorporates physical and mental care as wells as contextual needs such as formal care as demonstrated in this study is likely to be better for rural older individuals with complex health conditions.

Transportation was also identified as a critical barrier to accessing the healthcare needs of rural older adults with chronicity. Accessing care that is not available in local communities, especially speciality care, normally required long-distance travel to urban areas. Some older adults discussed their inability to cope with long-distance driving and, hence, made them dependent on relatives to access such services when there is no public transport. A similar Australian study (Muir-Cochrane et al., 2014) and another synthesis of primary evidence on barriers to health services (Corcoran et al., 2012; Suntai et al., 2021) reported transport barriers to health services use among rural older adults. Moreover,

qualitative research on the barriers to accessing specialist care among older people with chronic obstructive pulmonary disease in rural New Zealand indicated, among other challenges, transport barriers (Hopley et al., 2009). It is important to note that navigating these barriers is associated with significant levels of psychological distress and anxiety (Asante et al., 2022; Hopley et al., 2009).

For older people to access the required health services promptly, self-efficacy, social support, and positive attitudes of healthcare staff are crucial. Self-efficacy has been shown in the general population to be associated with positive health behaviours (Peters et al., 2019; Tzeng et al., 2019). The current study explicitly demonstrates how self-efficacy facilitates health services use among rural older adults with complex chronicity. Self-efficacy elements were associated with older adults' confidence and inner drive and may represent self-cognitions with respect to a desire to achieve their best possible health and well-being (Tzeng et al., 2019). Self-efficacy is very important in complex chronic disease management and is associated with the appropriate use of health services to improve health outcomes in multimorbid patients (Peters et al., 2019). This observation implies that higher self-efficacy may result in enhanced well-being for chronically ill older adults. Hence, an awareness of the self-efficacy levels of older patients may assist providers to identify those in need of enhanced self-management support (Peters et al., 2019). Further, as anticipated (Jaramillo et al., 2022; Muir-Cochrane et al., 2014), social support and positive attitudes of care professionals were crucial facilitators of accessing healthcare among older adults. Bardach, Tarasenko, and Schoenberg (2011) emphasized the importance of social support domains for rural older adults with significant medical needs.

Our participants shared their opinions on how the perceived barriers to healthcare could be addressed. Both older adults and care providers concurred with the need to address the inadequate workforce to reduce the workload of current practitioners and improve waiting time for appointments. Suggested strategies, however, differed slightly between providers and older adults. While providers were in favour of structural adjustments to attract more providers and ensure efficient use of care resources, patients tied workforce shortages to limited economic gains and suggested financial incentive packages to attract more providers to rural areas.

7.10 Theoretical Perspective

As explained earlier, Andersen's behavioural model of healthcare services use is a widely applied framework to analyse health-seeking behaviours. The framework assumes that health service use is a function of three constructs, namely, predisposing characteristics (e.g., age, health beliefs, and gender), need variables (perception of illness or diagnosed health conditions), and enabling factors

(e.g., wealth, availability of services, and support networks) (Andersen, 1995, 2008). Our findings contribute to the understanding of the need and enabling constructs of this model. We have highlighted common unmet needs of rural older adults with complex chronic conditions, corroborating the need variable of Andersen's model (Figure 7.1). Regarding the enabling factors, this study demonstrates that perceived positive attitudes of providers are an enabling resource for timely health services uptake by rural older adults. Self-efficacy has been shown to facilitate the appropriate use of needed health services (Isaac, Wu, McLachlan, & Lee, 2018). Moreover, social support is an enabling resource for health service use in a rural context. On the other hand, contextual factors such as transportation problems, long waiting times, workforce shortages, and the lack of continuity of care serve as critical barriers to accessing the required healthcare services. This study expands this model and its application by demonstrating how the model could be applied to study underlying factors of rural older people's underutilisation of specialist care services and has identified new factors including self-health efficacy, formal care, and continuity of care as potential determinants of health services use in the study subpopulation group

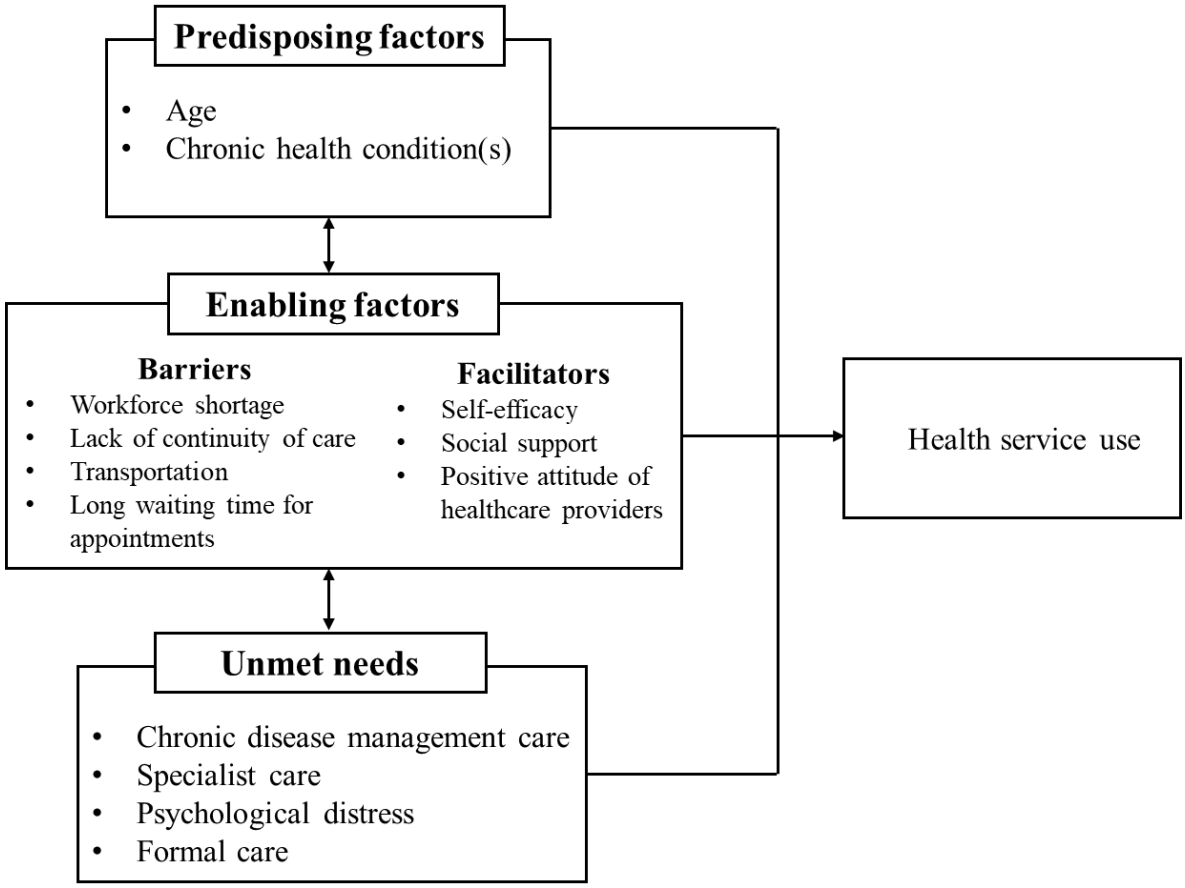

Figure 7.1. Unmet healthcare needs and factors of older adults' health services use

Source: Adapted from Andersen (2008)

7.11 Limitations

The findings of this study should be interpreted considering the following potential limitations. First, the study sample of older adults was from rural SA. As such, the generalisation of this study's results to different states would need further replication studies, such as, in different Australian regional areas. Second, the views shared by participants, especially healthcare workers, may be influenced by patient privacy issues and social desirability bias. Again, we did not stratify the views of healthcare professionals in the focus group interview. It is plausible that if we probed participants separately, differences in perceptions or contradictions may occur. However, the study aimed to explore unmet healthcare needs, barriers, and enablers in accessing health services from the perspectives of demand and supply sides in a composite manner. In this regard, the study has contributed to knowledge in several ways. Theoretically, the study shows the applicability of Andersen's model in qualitatively investigating the lived experiences of rural older adults in accessing healthcare. Through this, how various factors interact to shape health-seeking behaviour among older people in rural environments is demonstrated. The results also augment the literature on older adults with complex healthcare needs in rural environments. Again, this study is among the first to sample the voices of rural older adults and their healthcare providers in evaluating needs, barriers, and enablers of health services use. Hence, more qualitative studies will be necessary to explore this and other relevant details to contribute information and potentially shape policy by providing a forum in which older people and rural health practitioners can voice unique issues related to the rural healthcare system.

7.12 Conclusion

We explored the perspectives of older adults and healthcare professionals on health needs, barriers, and enablers of accessing health services among rural older adults with chronic health conditions. Older adults confront four broad unmet needs: Chronic disease management care, specialist care, psychological care, and formal care. Many access barriers have contributed to the unmet care needs; however, there are potential facilitators that could be leveraged to improve healthcare services access for older adults. The findings reinforce the need for governments and other stakeholders to act effectively to think of ways to improve care services in rural areas. Particularly, the existing system of formal care services provided in areas of personal hygiene, daily activities, and engagement in community and social activities may be strengthened. One way to achieve this might be to initiate programs to attract care workers to work in rural areas. Importantly, the provision of geriatric care services in rural settings needs to be reassessed and efforts should be made to train more professionals through scholarships and other appropriate incentive packages to work in rural care facilities. The study also provides new insight into the care needs and facilitators of services use. Particularly the

impact of health self-efficacy on health services uptake in late life and formal care needs, which has not been previously reported. The awareness of self-efficacy levels of older patients may assist providers in identifying those in need of enhanced self-management support. Overall, the findings of this study provide valuable data on perceived unmet healthcare needs and barriers to and facilitators of health services use (answering the research questions posed) and highlight the need for comprehensive stakeholder engagements, particularly among older adults, in an effort to address their care needs in rural environments.

CHAPTER

8

GENERAL DISCUSSION

8.1 Summary of Research Findings and Original Contributions

Expanding evidence suggests that the older population with complex chronic health conditions will require more professional care in the coming years (Borson et al., 2001; Jeste et al., 1999; Lippens, 2011). As the scientific community, policy drafters, and healthcare practitioners strive to institute measures to tackle the increasing pressures specifically posed by the ageing population on healthcare resources, significant attention has focused on understanding the factors associated with health services demand and use in later life (Lippens, 2011). Despite the crucial need for more data on older adults with complex care needs especially in under-served communities, limited attention has been paid to this cohort (Lippens, 2011). To address this crucial issue, this thesis was designed to make an original and novel contribution to extant knowledge on healthcare needs and factors associated with healthcare services utilisation among older adults with chronic health conditions, particularly in rural environments. The specific objectives of the studies undertaken in this research were to i) examine the prevalence of chronic physical and mental health conditions and their effects on general medical practitioners' visits among older South Australians; ii) investigate factors associated with specialist doctor visits and highlight rural-urban differences in speciality care services use ; iii) explore the impact of co-morbid psychological distress and multimorbidity on health services use among rural older people; and iv) understand unmet healthcare needs of older adults with co-morbid physical and mental health conditions and barriers to accessing needed care.

8.2 The Behavioural Model of Health Services Use

Andersen's behavioural model of health services utilisation served as the theoretical underpinning for this research project. As outlined in chapter one of this thesis, Andersen's model proposes four main constructs to explain health services use: (i) contextual factors (e.g., systemic factors and community variables), (ii) personal characteristics (e.g., socioeconomic factors), (iii) health behaviours (e.g., health services utilisation), and (iv) outcomes (e.g., satisfaction). The focus of the current research was on the first three components associated with health services use among older adults. The various characteristics within each component are discussed under three constructs: predisposition, enabling factors, and need for care (Andersen, 2008).

The research objectives were successfully achieved in four related studies and the findings contribute to improve our understanding of ageing and healthcare demand, factors affecting health services utilisation, and barriers to health services utilisation,—particularly in rural and remote locales. Moreover, the results from these studies offer invaluable insights for public health policy design, practice, and future research directions. Table 8.1 summarises the specific research objectives, key

findings and implications of the research observations from the four studies. This work has shown that older people across rural and urban South Australia have similar burden of chronic physical, and common mental health conditions and that these conditions are associated with higher demand for GP services. Mental health conditions were independent predictors of higher GP visits in rural and remote areas. Moreover, certain demographic characteristics such as increasing age and female gender were significantly associated with a higher frequency of GP visits (Study 1—Chapter 4). Again, physical, and mental health conditions, as well as increasing age and attaining a higher level of education, were found to predict specialist doctor services use. However, a rural-urban disparity in the use of speciality care was observed where urban older adults reported significantly higher uptake of speciality care services than their rural counterparts after controlling for age, education, and chronic health conditions (Chapter 5). The results also provide evidence that psychological distress and multimorbidity have independent associations with health services use among older adults in rural areas. This implies that regular screening and initiating early treatment of psychological distress that may be present with multimorbidity in older people may help reduce the demand for rural health services (Chapter 6). It is important to emphasis that screening exercise when not properly carried out may result in unintended consequences such as stigmatisation. Additionally, older people in rural Australia with complex chronic health conditions are confronted with four broad range of unmet needs: chronic disease management care, specialist care, psychological care, and formal care. Many access barriers emerged to have contributed to these unmet care needs, however, some potential facilitators could be leveraged to improve healthcare services access for older adults.

Even though a more in-depth discussion has been provided in the relevant chapters of the thesis, the subsequent sections presents general overview of the key findings and discuss the implications of the research findings, limitations as well as future research directions in more detail.

Table 8.1 Summary of key results and main implications

Specific study objectives	Main findings	Key implications
Examine the prevalence of chronic physical and mental health conditions and their effects on general medical practitioners' visits among older South Australians	(a) The prevalence of physical and mental health conditions was similar across urban, rural, and remote areas. (b) Rural and remote older adults used GP services more for mental health needs.	(a) Mental health services inadequacies and gaps in rural areas need to be revisited for policy remedy. (b) Psychosocial interventions such as psychotherapies and integrated care are to be instituted in rural clinical settings. (c) Need for further research on integrated physical and mental care models capable of meeting the needs of rural older adults with complex care needs.
Investigate factors associated with specialist doctor visits and highlight rural-urban differences in speciality care services use	(a) Availability of services and SES were associated with specialist care use. (b) Rural older adults reported lower use of specialist care services compared with urban older people.	(a) The provision of specialist care services in rural environments needs to be improved. (b) Further social health policy interventions are required to cushion the poor older adults in rural areas to meet their speciality care needs. (c) Further exploration to improve access to evidence-based interventions to improve specialist care throughout the healthcare system, but especially in rural settings is needed.
Explore the impact of co-morbid psychological distress and multimorbidity on health services use among rural older people	(a) Multimorbidity was associated with increasing age. (b) Psychological distress was associated with complex chronic conditions. (c) Multimorbidity and psychological distress were independently associated with higher demand for health services.	(a) Psychological distress particularly in the presence of multimorbidity presents an opportunity for intervention by clinicians that may reduce the demand for rural health services. (b) Future studies are needed to explore optimal strategies and cost-effective mechanisms to holistically address multimorbidity and psychological distress in older patients. (c) There is a need to improve primary care to reduce the prevalence of multimorbidity and psychological distress. (d) Again, psychosocial interventions will be crucial in dealing with comorbid physical and mental health problems among rural older adults.
To understand the perceptions of unmet care needs, barriers to care access and facilitators of care use in rural areas	(a) Four interrelated unmet needs including chronic disease management, psychological distress care, specialist care and formal care were identified. (b) Workforce shortages, a lack of continuity of care, inability to self-transportation, and long waiting times for appointments were the key barriers to care needs. (c) Self-efficacy, social support, and positive provider attitudes emerged as crucial enabling factors of service use.	(a) The findings reinforce the need for governments and other stakeholders to act effectively to think of ways to improve care services in rural areas. (b) Opportunities for older adults and their rural-centric care providers to make inputs into policy formulations intended to improve health services access and outcomes for older people should be provided by structural and community efforts. (c) Further qualitative studies on complex health needs and service barriers and experiences of older patients in rural areas are required. This will help highlight contextual issues of ageing and healthcare access in distinct geographical locations.

8.3 Overall Answer to the Research Problem

Several aspects of rural older people's health and services utilisation could potentially be explored, but this research project focused on key issues and explanations of their health services uptake as shaped by personal characteristics, supportive systems, and geographical variables.
Specifically:

- Chapters 4 and 5 argue that older people's health and their use of speciality care services could be influenced by factors of geographical context usually beyond individual capabilities: that making services available and accessible in rural areas could influence health-seeking decisions in later life.
- Chapter 6 suggests a strong association between multimorbidity and psychological distress and demonstrates how both appear to independently predict largely undesirable outcomes of health services use (i.e., hospitalisation and ED services) among rural older people.
- Chapter 7 demonstrates that rural older individuals experience four broad barriers to meeting needed healthcare and that self-efficacy and positive attitudes of care providers could be leveraged to improve appropriate use of needed health services in later life.

These findings indicate that both individual factors and geographical circumstances should be evenly prioritised in public policy development to safeguard the well-being of the usually vulnerable older population in society. This thesis argues that health and patterns of health services use is shaped by much more than just the characteristics of older adults. Summaries by topics are found below.

8.3.1 Prevalence of Chronic Physical, and Mental Health Conditions in Older Adults Across South Australia and their Independent Effects on GP Visits

As reviewed in chapters 1 and 2 of this thesis, older people have a higher need for healthcare services. They are known, for example, to visit emergency departments and GPs more frequently than the younger age groups (Lowthian et al., 2013; Schlichthorst et al., 2016). With the reported higher prevalence of complex physical and mental health conditions in later life, whether the pattern of GP consultations among older adults is influenced more so by their physical or mental healthcare needs is not clearly established in the literature. Moreover, beyond the descriptive reportage of available national health data, a more fine-grained analysis of chronic health prevalence across rural and urban areas was needed to guide public health policy development. The first study of this thesis utilised the South Australian Monitoring and Surveillance System (SAMSS), subsequently changed (in 2017) to the South Australian Population Health Survey (SAPHS) data on older adults (60 years or above) to

(a) compare the burden of chronic physical and mental health conditions between rural, remote, and urban areas; and (b) examine the independent effect of physical and mental health conditions on patterns of GP service use.

8.3.2 Prevalence of Physical and Mental Health Conditions in Older Adults across South Australia

Overall, the burden of common physical and mental health conditions examined was similar in the study sample across rural, remote, and urban locations based on the Modified Monash Model (MMM) of geographical taxonomy employed. It is important to note that this result was unanticipated given the expanding reports about differences in prevalence estimates of physical and mental health burdens between rural and urban areas in the literature (Probst et al., 2006; Purtle et al., 2019; Rahman et al., 2021). While many of these studies argued that older adults in rural and remote communities vs urban residents suffer disproportionate risk of chronic health conditions (Durazo et al., 2011; Goeres et al., 2016; Weden et al., 2018; Zhong et al., 2007), other researchers contend that certain rural specific characteristics such as relatively lower noise pollution levels which are believed to impact sleep quality, and community connectedness may serve as a protective factor against chronicity, especially mental health in rural areas (Peen et al., 2010; Purtle et al., 2019; Rahman et al., 2021).

Studies reporting on the disproportionate burden of physical and mental health conditions in older people in rural vs urban areas (Goeres et al., 2016; Zhong et al., 2007) have cited limited access to health services, risky health behaviours such as lower intake of fruits and vegetables, excessive smoking and alcoholism, self-reliance— the act of taking care of one's own health problems without seeking professional help, and lower socioeconomic status that are more prevalent in rural locales as the major risk factors of chronic conditions. Limited access to mental health resources in rural and remote Australia has been linked the higher suicide rate in rural areas compared with urban Australian locations. Similarly, previous reports have indicated a higher burden of physical health conditions such heart conditions, diabetes, and cancers in rural and remote Australia when comparing rural and urban data (Australian Institute of Health and Welfare, 2019; Alston et al., 2017; Sahle et al., 2016). The contradiction observed between previous Australian data and the current study may be due to reasons such as the inclusion of data on younger age groups in prior studies. It is not clearly understood why data was not aggregated in prior Australian studies. However, the findings reported here are refined to only older adults in South Australia. Hence, a refined data may exhibit unique characteristics, which may have been lost to less refined national datasets.

Notwithstanding this contradiction, the result of the current study agrees with similar findings in South Australia and other international studies. Particularly, this finding is in keeping with the analysis of Tideman et al. (2013) of rural-urban differences in the risk profiles and outcomes of CVD in Australia, as well as the observations of Sun and colleagues (2020) on rural-urban differences in risk factors and depression prevalence in older American adults. In both studies, the researchers could not find significant differences between the relevant physical and/or mental health conditions studied between urban and non-urban adults. Moreover, Phaswana-Mafuya et al. (2019) have reported a similar prevalence of common chronic health conditions including asthma, arthritis, lung disease, obesity, stroke, depression, and anxiety among older adults across rural and urban locations. An interesting finding of this thesis is that suicide ideation independently predicts frequent GP visitations. This finding suggests that the increasing rate of suicide deaths among rural older people could be reduced through designing more effective interventions specifically for mental health problems in older adults at rural GP settings .

Again, similar patterns of results to that observed for the distribution of the burden of physical and mental health conditions emerged for self-reported GP consultations across the study settings. Contrary to the widely reported assertion that access to, and use of health services decrease with geographical remoteness (Humphreys et al., 2002; Strong & Strong, 1998), there was no significant difference in the self-reported high GP visits (6 visits or more in a year) between urban and rural samples, suggesting that healthcare need may be a better predictor of health services use in later life rather than access variables. This is generally in alignment with Andersen's behavioural model of health services use, such that a similar burden and/or need for health services is likely to induce similar help-seeking patterns (Andersen, 1968, 1995). An individual's need for health services may serve as a motivating factor to circumvent access barriers to the needed care services (Sutter, 2017). Access to services and utilisation are two different concepts and the former cannot be construed as or equated to the latter. According to Lewis et al. (1976), evidence of access is achieved through utilisation. For any individual to use health service(s), there must be a perception of a need for the service(s). Thus, the person must become aware of a health condition, and decide whether the condition warrants medical assistance in consideration with service availability within a reasonable time or distance (Fiedler, 1981; Mechanic, 1972).

Interestingly, despite the similar pattern of rural-urban GP services use in this study, more rural and remote vs urban older people visited GPs with mental health challenges. This may be an indication of limited specialised mental health services in rural and remote areas. Rural and remote-centric older Australians are faced with inadequate specialist psychiatric services and acute mental health services (Muir-Cochrane et al., 2014). Another potential explanation is the awareness or recognition of their

mental health conditions in the first place, to determine the appropriate service required. Older people living in rural areas may not necessarily visit GPs for mental health care as they may not be aware of their mental health conditions due to lower education and health literacy rates, and hence, they may interpret mental health challenges as physical health challenges requiring GP attention (Sartorious, 2013). This finding validates prior claims from similar studies in South Australia (Dempsey et al., 2003; Eckert et al., 2004), and other international reports in which older people in rural locales have been found to underutilise needed speciality mental health resources (Crabb & Hunsley, 2006; Roh et al., 2017; Sanders et al., 2008). Beyond limited access to specialists in rural locales, there may be other factors contributing to older individuals' underutilisation of speciality services. Contributing to understanding of this phenomenon, the qualitative interviews of this thesis suggested that most older people were not aware of available mental health services. Also, most of them do not perceive distress and emotional changes as mental problems requiring professional attention. These observations are particularly troubling in light of the Andersen's behavioural model, which posits that need and enabling variables are associated with appropriate health service utilisation (Andersen, 1995). The overreliance on GPs for mental health services reinforces the need to improve mental healthcare provision in rural environments (Henderson et al., 2018; Muir-Cochrane et al., 2014).

8.3.3 Specialist Care Visits Outside the Hospital by South Australian Older Adults

As outlined in Chapters 1 and 5, specialist practitioners help in managing complex chronic health conditions that are particularly more prevalent in older individuals. However, speciality care resources are relatively limited in rural areas compared to metropolitan settings. Currenty, only a few studies have investigated speciality care services utilisation among older adults with chronic health conditions (Hopley et al., 2009; Suominen-Taipale et al., 2004; Williams et al., 2020), and no study has overtly examined the correlates and rural-urban differences in specialty care use among older Australian adults. The Andersen's (2008) framework was utilised to provide some insights into patterns and factors associated with specialist doctor visits by older adults across rural and urban South Australia.

It was found that increasing age and male gender were the strongest predictors of specialist doctor visits among the predisposing characteristics. Increasing age and higher use of specialised care services continues to attract the attention of care professionals and researchers (Anderson, 1973; Bowling, Farquhar, & Browne, 1991; Dall et al., 2013; Fernández-Mayoralas, Rodríguez, & Rojo, 2000; Kwon et al., 2019; Newbold, Eyles, & Birch, 1995). The oldest-old are about five times more likely to use formal healthcare services compared with the younger-old group (Gyasi, 2018).

Increasing age has implications for health and well-being and growing older is generally associated with increasing health challenges and greater demand for specialised health services (World Health Organisation, 2015a). Therefore, older people tend to access more specialised services to manage their complex chronic conditions and to monitor and prevent the onset of new ones (Starfield et al., 2005).

Counterintuitively, older females were less likely to use specialist care than males. It has widely been reported that men are reluctant to access formal health services due to male 'business as usual' norms which describe men as stoics (Addis & Mahalik, 2003) and subject to social construction and expectation of masculinity (Alston & Kent, 2008). Again, epidemiologists have long noted that due to the biological make-up and childbearing role of females, they tend to suffer a higher prevalence of complex chronic health conditions, holding all other things constant (Ofori-Asenso et al., 2019). It is, therefore, very surprising to find that older women in South Australia reported lower levels of specialist consultations than men in this study. A possible reason could be that most females needing specialist care are seeing their GPs. As already demonstrated in the first study of this project, females were more likely than males to access higher levels of GP service. Again, available evidence suggests a gender difference in the risk of certain chronic diseases requiring speciality care management. For instance, men have a higher risk of cardiovascular diseases (i.e., heart disease, stroke) requiring specialists' care management (Milani et al., 2016). Moreover, female use of specialist doctor services at lower rates compared to males may also be tied to socioeconomic disadvantages as discussed subsequently in paragraph 6 of this section.

Among the need variables, having chronic physical health and/or mental health condition demonstrated a significant association with speciality service use. This result corroborates earlier international reports on speciality care services use among older adults (Lippens, 2011; Schulz et al., 2020; Starfield et al., 2005). For instance, examining predictors of help-seeking for mental health challenges among older Canadian adults, Lippens found that comorbid health conditions and subjective poor self-rated mental health and severity of mental health symptoms positively related to frequent service use. Comorbid health conditions are highly prevalent in later life (Fortin et al., 2006; Fortin et al., 2005; Glynn et al., 2011; Gontijo Guerra et al., 2019; Lippens, 2011; Ofori-Asenso et al., 2019), and associated with poor well-being outcomes and greater functional impairments among these older cohorts (McPhail, 2016). Research examining the rate of chronicity in later life has shown that older people have a higher risk of coexistence of physical and mental health conditions (Hopman et al., 2016; Steptoe et al., 2015), requiring higher demand for speciality care. Also, multimorbidity has been shown to increase with age in a recent systematic review (Ofori-Asenso et al., 2019). It was,

therefore, anticipated that chronic physical and common mental health conditions were to be positively related to specialist doctor visits.

It is insightful that chronic physical and mental health (as an indicator of the need for services) demonstrate significant association with speciality care service use. However, the low rate of service uptake in this sample of older adults may imply that a greater number of older people who may need specialty services are not accessing them. Although older people may be aware of available specialist care options and acknowledge the effectiveness of these services, they may not interpret (especially with mental health problems) their conditions as warranting these services (Lippens, 2011; Mackenzie et al., 2008). Given that older people are shown to underrate their perceived need for health services (Issakidis & Andrews, 2002; Mackenzie, Pagura, & Sareen, 2010), the perceived need is a potential contributor to lower use of speciality care among older adults with chronic health conditions in South Australia.

This study also found that educational attainment and geographical location have significant associations with specialist visits. These two variables were used as enabling factors for service use. While education was used as a proxy for better opportunities for present or previous high-paying jobs (higher income), geographical remoteness indicated limited access to needed speciality care. Hence, it was expected that: 1) higher education will be positively related to a speciality doctor visit, and 2) urban living will be positively associated with speciality care uptake. In line with the expectations, older adults with higher educational qualifications (diploma certificate or above) tended to visit medical specialists more than those with lower academic certificates. Probing this phenomenon further, the qualitative data indicated that older adults with lower socioeconomic status and without adequate social support who perceive a need for speciality care were not accessing services due to financial challenges. Higher income may enable individuals to afford out-of-pocket charges involved in a specialist consult when a need is perceived.

Finally, this study also found a rural-urban disparity in the use of medical specialist services. Rural older adults reported significantly lower levels of speciality care utilisation than their urban counterparts. Even though complex chronic conditions (as discussed earlier) were strongly related to specialist consultation, older adults with heart attacks for example, were more likely to visit a specialist if they were in a metropolitan area (25.1%) as opposed to a remote community (15.9%). This reflects the longstanding challenges in accessing specialised services in Australian rural environments (Gruen et al., 2001; Gruen, Weeramanthri, & Bailie, 2002; Henderson et al., 2018; Jong et al., 2005). The low rate of speciality services use among rural older folk is especially concerning for several reasons. Increasing evidence of effective chronic disease management in older adults

(Hopley et al., 2009; Suominen-Taipale et al., 2004) suggests that many who are not currently accessing services could be experiencing significant improvement with speciality services. Additionally, the proportion of older people keeps increasing in rural communities; hence, the number of rural older people needing speciality care services will also rise significantly. It has been argued that a greater supply of health services facilitates timely and appropriate service use (Häkkinen, 1991). From a different perspective, the lower rate of speciality services use could also mean two things: First, the underutilisation may be contributing to the higher burden of multimorbidity in rural areas earlier reported elsewhere (Alston et al., 2017; Ofori-Asenso et al., 2019). Second, lower utilisation may be a good thing as it may reflect a broader scope of cost-effective practices by rural clinicians, saving patients from expensive visits to a specialist.

Taken together, the findings of this study extend the literature and generate invaluable data by exploring the effects of geographical and socioeconomic factors associated with speciality care utilisation in later life. These findings may have implications for future policies and research direction towards improving access to evidence-based specialist care interventions throughout the healthcare system, especially in rural settings.

8.3.4 The Impact of Psychological Distress and Multimorbidity on Health Services Use Among Older Adults

The findings of the first two studies in this project indicated that older adults in non-urban areas underutilise medical speciality services, particularly mental health services. As discussed in the concluding part of Chapter 5, underutilisation may be contributing to the higher prevalence of suicide rates, and increased burden of multimorbidity in rural areas (Alston et al., 2017; Ha et al., 2015; Kshatri et al., 2020; Ma et al., 2020; National Rural Health Alliance, 2017; Wang et al., 2015). Multimorbidity has been linked to poor mental health, especially severe psychological distress (Alhussain et al., 2017; Brown et al., 2014; McPhail, 2016; Scott et al., 2016; Soysal et al., 2017; Swartz & Jantz, 2014). However, relatively few studies have investigated the relationship between psychological distress and multimorbidity in older adults. Further, no study has been found to have explicitly explored the impact of comorbid psychological distress and multimorbidity on health services use among older adults in rural settings. The next goal of this thesis, therefore, was to investigate the prevalence of psychological distress in rural older adults and to evaluate the relationship between psychological distress, multimorbidity and health services (GP, hospitalisation, and emergency service) utilisation in South Australia.

The current study found 13% of the rural older adults to have symptoms of moderate to high levels of psychological distress. Compared to previous Australian data (Phongsavan et al., 2013; Kelly et al., 2010), a relatively low (3.3%) prevalence of severe psychological distress observed in older adults in the current study may be due to many factors. First, the current study excluded data on older adults self-reporting diagnosed mental health conditions which may not have been done in prior studies. The reason for the exclusion of this subsample was to tease out psychological distress from doctor-diagnosed mental health conditions. Diagnosed mental health disorders when not set apart may confound the relationships (association between psychological distress and health services use) been tested. Older adults with mental health conditions such as anxiety are more likely to experience non-specific depressive symptoms and mood disorders. Comorbid anxiety and psychological distress are highly prevalent in late life (Byers et al., 2010). Studies investigating the onset of severe mental health conditions among older people with comorbidity have suggested that psychological distress often precedes the onset of depression and anxiety (Atkins et al., 2013; Brumby et al., 2011; Burnette, Duci, & Dhembo, 2017). Therefore, excluding those with self-reported diagnosed mental health conditions helped to provide a better gauge of the prevalence of psychological distress in older adults living with physical health conditions. Secondly, these earlier studies included much younger participants than the current study. For instance, while the average age of participants in the current study was 71.2 years, that of Kelly et al. (2010) was 55.1 years. The prevalence of psychological distress has been found to decrease with increasing age (Alhussain et al., 2017; Avery et al., 2004), another possible reason accounting for the lower rate reported in this sample. These findings support the need for targeted population groups for screening and treatment of severe distress.

In line with expectations, multimorbidity was associated with severe psychological distress such that an increasing number of chronic health conditions coexisting demonstrated a significant association with high psychological distress. Similar findings have been discussed earlier in the literature where older people suffering from multiple chronic health conditions were more likely to experience high psychological distress (Alhussain et al., 2017; Fortin et al., 2006). These findings raise a critical question about psychogeriatric practice and services in rural locales. According to Sartorious (2013) which has been re-echoed by Bor (2015), many psychological disorders associated with physical health conditions in older adults often go undiagnosed in generalist consultations. This is because only few health care providers have the requisite training to address mental health disorders in older patients. This may be because physical health is normally prioritised over mental health for older people in medical training and in clinical settings, but also older people find it challenging to differentiate between psychological distress and emotional swings of daily life (Wuthrich & Frei, 2015).

In addition, limited specialist providers in rural areas constitute further challenges in rural environments. There is limited professional training in specialised psychiatric diagnosis for GPs and other general health professionals (e.g., nurses) to distinguish between distress accompanied by physical illness (e.g., cancer) and mental health challenges, such as psychological distress or depression. Hence, health professionals in rural settings may miss out on or underestimate mental distress that might be present in their older patients (Kuswanto et al., 2018; Ryan et al., 2005; Zabora et al., 2001).

The study found sufficient evidence to suggest that both psychological distress and multimorbidity have independent associations with health services utilisation. Specifically, irrespective of sociodemographic profiles, multimorbidity was associated with hospitalisations, high GP visits, and frequent ED services use. The findings contribute theoretically to the need construct of the Andersen's model. Further, psychological distress in older adults in rural locales was for the first time found to be independently associated with higher health resources utilisation. The striking difference observed in this analysis for older adults with similar disease profiles, but different levels of psychological distress and health-seeking patterns, suggests that the underlying psychological distress must also be prioritised in clinical settings. This implies that early diagnoses and treatment of psychological distress co-occurring with chronic physical conditions in older adults will have a significant impact on patterns of health services use and reduce the cost burden of healthcare on both older individuals and the state. Hence, effective integration or collaborative care system where GPs and health professionals pay attention to symptoms of psychological distress among older adults in rural clinical environments is appropriate.

8.4 Unmet Health Care Needs of Older Adults with Comorbid Physical and Mental Health Chronic Conditions in Rural South Australia

In previous studies in this thesis, the prevalence of chronic physical and common mental health problems and the associated factors of older adults' health services utilisation are noted. In the final study, perceived unmet health needs and the contextual factors that restrict rural older people from accessing needed care services were explored using qualitative data. It is believed that quantitative methods are generally inadequate in addressing social and behavioural problems such as health-seeking behaviour and that firsthand account of study population may produce more realistic results. To date, only a few studies have tried to understand perceptions of health needs and whether available services and modes of delivery or provision structures can meet those needs from the standpoint of rural older adults.

This study, therefore, was not only designed to provide in-depth insights into the nature of the associations observed in the quantitative studies, but also to describe the context in which health and patterns of health services uptake among rural older adults is shaped. The overarching question addressed in this study is: How do rural older adults with chronic conditions perceive their health needs and navigate the healthcare system to access needed care? This question is addressed with two sub-questions: (1) What are the perceived unmet healthcare needs of community-dwelling older adults in rural South Australia? and (2) What are the challenges to care access and facilitators of health services utilisation? A comprehensive understanding of these issues could be an important premise of policy design and practice evaluation to improve rural older people access and utilisation of services for positive outcomes. Specifically, data gathered on rural older adults' needs and services use determinants could inform policy design and care delivery models to meet their most pressing needs.

Using Andersen's theoretical constructs of health services use to guide the analysis of interview data from both older adults and their rural-centric providers, the present study found that older adults have four broad unmet care needs (need dimensions) which may be due to a range of barriers (enabling/barrier dimension) to care that confront this population group. However, participants discussed potential enablers (enabling factors) that could be maximised to improve healthcare access and utilisation for older adults. The study findings are summarised and, where appropriate synthesised with the quantitative results below.

8.4.1 Unmet Health Care Needs

There was a general perception that older adults require a range of care services including chronic disease management resources, speciality services, psychological distress management, and formal caregiving that are either limited or unavailable in rural locales, as was expected (Jaramillo et al., 2022; Miao et al., 2021). This finding is consistent with the observations of similar studies reporting on rural and remote healthcare challenges in similar health systems. A recent review of available literature to understand barriers to and facilitators of access to chronic disease management care in rural areas has indicated among other things that poorly structured systems in rural locales and limited access to services such as palliative care may result in unmet healthcare needs and goals of care (Cai & Lalani, 2021). In rural America, for example, limited access to chronic disease management services has been noted as one of the main reasons that led to poor disease management and health outcomes (Dickman, Himmelstein, & Woolhandler, 2017).

Despite their critical role in the diagnosis and management of complex chronic health conditions that rural populations are known to be at higher risk of, medical speciality services are limited in small rural towns and remote communities (Baldwin et al., 2008; Karunanayake et al., 2015; Kuhlthau et al., 2004). Unmet mental care needs of older people in rural environments have been recognised both locally and internationally. This study is the first to report unmet psychological distress needs of rural older adults. However, this finding is related to earlier reports Australian reports Muir-Cochrane et al. (2014) and Henderson et al. (2018). Both studies have earlier demonstrated that rural older adults with mental health problems are faced with difficulties meeting their service needs due to service gaps (availability, accessibility, and awareness) and governance structures. Based on this, it was not surprising that rural older adults were found to be more likely to rely on GPs for their mental care needs in the quantitative phase of this project. Earlier research has indicated that rural older adults prefer to visit their GPs or family physicians for mental help (Waxman, Carrier, & Klein, 1984), and has found lower levels of speciality doctor visits among older adults with depressive symptoms (Unützer et al., 2002).

These findings are particularly troubling since the rates of mental health problems in community-dwelling older adults in rural areas have been rising and these problems are usually linked with comorbid physical diseases, worsening the health outcomes of older patients (Sirey et al., 2008). In particular, the high levels of unmet care for mental health problems in rural older adults continue to attract attention (Crabb & Hunsley, 2006; Gureje, Kola, & Afolabi, 2007; Sirey et al., 2008). These findings imply that older adults may not be accessing needed services that are not locally available, receiving inadequate care or may delay treatment for conditions requiring such services. Accessing some of these services, normally requires older people to travel long distances to urban areas where these services are available. Socioeconomic factors such as education and income have been shown to predict speciality care services even when they are available locally since most of these services require patients to bear full consultation payments or make co-payments. Unsurprisingly, some of the rural older adults with chronic conditions who participated in the present study mentioned that given their financial and health conditions they cannot afford the cost of these specialised services even when subsidised by national insurance policies and still take on the additional travelling costs. This situation, according to prior studies continues to increase underutilisation of needed services, missed appointments, rapid functional decline and frailty, higher morbidity, and mortality rates among rural and remote older populations (Thompson, Issakidis, & Hunt, 2008; Trollor et al., 2007; Crabb & Hunsley, 2006)

While the quantitative analysis showed a significant association between education, rurality and lower odds of specialised services use, this qualitative data has also highlighted that rural older people's

relatively lower use of mental health and other specialised services is partly tied to the unavailability of services in local clinical settings and socioeconomic factors.

8.4.2 Barriers to and Enablers of Health Services Use

This study also explored barriers to and enablers of health services utilisation by older adults. Consistent with Andersen's proposed health services utilisation model, older adults and their healthcare providers discussed four broad barriers including workforce shortages, long wait times for appointments, lack of continuity of care, and transportation challenges that impede access to and use of needed services among older adults. The access barriers identified were interrelated and similar to those earlier reported in other rural communities (Muir-Cochrane et al., 2014). On workforce shortages, for instance, participants in this study discussed inadequate healthcare professionals and a high rate of provider turnover which they believe has led to limited healthcare supply in local facilities. Other studies of gaps in healthcare for rural older populations have reported similar barriers (Douthit, Kiv, Dwolatzky, & Biswas, 2015; Suntai et al., 2021; Thorpe, Thorpe, Kennelty, & Pandhi, 2011). In addition, a systematic review aimed to understand shortages of sufficient healthcare in rural areas found provider shortages as one of the crucial healthcare challenges in rural areas (Weinhold & Gurtner, 2014).

Provider shortage in rural environments has almost exclusively been discussed from the perspective of providers. GPs are the largest provider groups in rural areas (Geyman et al., 2000; Humphrey et al., 2012). The emergence of workforce shortage has been linked to infrastructural deficiencies and physical barriers, such as those related to a communication infrastructure (Cleland et al., 2012), public transport issues (Matsumoto, Inoue, & Kajii, 2001), and sometimes an absence of sociocultural facilities (Alexander, 1998; Kearns et al., 2006). These issues were discussed among the participants as contributing factors to the widespread unwillingness to practice in rural locales. Moreover, other sociocultural factors including provider's family resistance, fear of social isolation and perceived unsuitable work-life balance are known to discourage rural practice (Renner et al., 2010; Rogers, Searle, & Creed, 2010; Smith, 2005). Also, participants were of the view that limited opportunities in rural areas for practitioners to specialise or further their medical education demotivates many providers; a finding which aligns with prior research observations (Curran, Rourke, & Snow, 2010; Kralj, 2001)

Lack of continuity of care which is closely related to a high turnover of health professionals was identified and discussed extensively by the study participants. The general perception among the participants was that physicians stay shorter periods in local health facilities. This phenomenon, the

study participants believe has led to seeing new faces in consulting rooms most of the time. Older people will want to see a regular doctor who will get to know their conditions very well. Some of them suggested that continually seeing a regular doctor will help build patient-doctor trust upon which they (older adults) can confide with their mental health challenges. Moreover, seeing a regular doctor was linked to efficient use of consulting time amid the busy schedules of physicians. Doctors may not need to read the medical history of older patients each consulting time. According to Jaramillo and colleagues (2022), older adults build trust and are more confident with providers they have seen for a reasonable period. This result suggests the need for more physicians to pursue their carriers in rural clinical settings. This can be achieved through policy decisions that make rural practice more attractive for physicians.

As imagined, participants in this study identified transportation barriers to healthcare in rural areas. Specifically, participants mentioned long-distance travel, unavailable public transport, and incapacity to self-drive to metropolitan areas. Research has shown that rural populations have huge transportation challenges and often commute longer distances to receive healthcare (Goins et al., 2005; Van Rooy et al., 2015). These are known to affect healthcare access by rural older adults (Agyemang-Duah et al., 2019). Moreover, qualitative research on transportation barriers to accessing specialist care among older people with chronic diseases have been described in rural areas around the globe (Hopley et al., 2009). It is important to note that navigating these barriers may be associated with significant levels of psychological distress and anxiety (Asante et al., 2022; Hopley et al., 2009).

Despite the challenges to meeting the healthcare need discussed above, this study also found that factors such as self-efficacy, social support, and positive attitudes of providers encouraged the use of available services. Health self-efficacy is crucial in chronic disease management (Peters et al., 2019). Higher self-efficacy enhances health literacy and promotes healthy behaviours and compliance with treatment regimens (Chang, Park, & Sok, 2013; Roncoroni et al., 2019). The significant role of self-efficacy in the use of services and promotion of self-management and health well-being is widely acknowledged in the literature (Bowen et al., 2015; Fan & Lv, 2016; Farley, 2020; Remm et al., 2021). It was, therefore, not surprising that health self-efficacy was found to promote health services use in the current study. This supports the idea that health self-efficacy plays a critical role in healthy ageing of older people in areas of health-promoting behaviours and better self-management of chronic health conditions (Remm et al., 2021).

Further, in line with expectations (Horsburgh & Peri, 2009; Jaramillo, Haozous, & Willging, 2022; Muir-Cochrane et al., 2014), social support and positive attitudes of care professionals were discussed by the participants as crucial facilitators of health services use among older adults. These findings are

not exclusive to this study as Bardach et al. (2011) have emphasised the importance of social support domains for rural older adults with significant medical needs. Social support aspects such as having caregivers, receiving remittances from adult children, and regular contact with friends and relatives are demonstrated to improve healthcare utilisation (Gyasi et al., 2020). Typically, older adults who are less confident driving long distances rely on friends and relatives to transport them for appointments out of town. Researchers examining the relationship between social support and the use of needed health services among older individuals have acknowledged the important role of various social support domains in ageing and healthcare (Kouzis & Eaton, 1998; Maulik, Eaton, & Bradshaw, 2011; Peng et al., 1995).

Researchers have long indicated that healthcare provider behaviours potentially can impact health services utilisation across all age groups. The current study contributes knowledge to this debate about the relationship between provider behaviour and healthcare utilisation by older adults. Largely, older people in this study were satisfied with the attitudes of providers and commended them (providers) highly. While most older adults indicated their appreciation of the attitudes of their care providers and willingness to continue their chronic management plans with them, a few indicated that they had transferred their care to urban areas, particularly healthcare facilities in Adelaide. This group of older adults frequently cited continuity and limited supply of specialist services as the main reasons, rather than the attitudes of rural-centric providers. Of note, it has been argued that prior unsatisfactory experience by older adults with physicians could affect future help-seeking decisions when a need is perceived (Haug & Ory, 1987). The authors further explained that the fear of recurrent perceived ageist stereotypes could deter older adults from utilising formal care services by resorting to alternative care options available.

Older people may be very sensitive to the behaviours of healthcare professionals and prefer their service providers to be kind, polite, and friendly and have ample time to communicate with them during consultations (Marcinowicz et al., 2014). In examining barriers to and enablers of older people's utilisation of health services, Kiyak and Reichmuth (2005) found that provider behaviours could be an important enabler or barrier. Provider behaviours were found to be an enabler of health service use in this study. This finding suggests that positive attitudes by providers could be leveraged as an important enabling factor of health services use among rural older adults.

8.5 Research Limitations

The findings of this thesis, like any other social scientific research, have some limitations that must guide its interpretation. These limitations have been discussed within each of the four studies. However, some of the key limitations are: First, the quantitative data findings (Studies 1-3) on

associations between variables reflect a sample of the SAMSS survey data and may not be reflective or generalisable to other states and territories of Australia, where characteristics of rural communities such as population density and accessibility of health resources may differ. Specifically, South Australian regions are predominantly small rural or remote with only a few communities classified under MMM as rural and Adelaide as an urban city (Modified Monash Model, 2012). Again, the state (South Australia) is one of the most cosmopolitan and culturally mixed regions of Australia with a higher proportion of Indigenous Australians and older population, making the findings crucial and relevant to policy decisions and practice. However, it is regrettable to emphasise that due to ethics limitations, the qualitative phase of this study did not include Indigenous individuals who are a very significant population group when looking at health status, access issues in rural and remote communities in Australia. Moreover, given that SAMSS was designed to exclude institutionalised older adults (e.g., residents in nursing homes, and those on hospital admission), only community-dwelling older individuals were interviewed. It is, therefore, possible that the generalisability of the results will be limited to community-dwelling older individuals.

Second, the first three studies employed a cross-sectional design and do not provide information to determine causal relationships between variables. It also suffices to note that most of the variables assessed in this research project, including health service utilisation, physical health conditions, mental health conditions, and other distressing symptoms were based on self-reports which potentially suffer social and subjective biases. These biases, normally arising from recall and response challenges, particularly among older populations are almost inevitable which could, in turn, affect the veracity of research findings (Van de Mortel, 2008). However, self-reporting is very common in health service utilisation research as it is considered the most convenient method to capture respondents' subjective views of health-seeking behaviours (Andersen , 1995). Again, subjective responses and recall problems associated with this technique may confound the findings of research studies of this nature. In the case of this thesis, the probability of response bias is very minimal, given that bias mitigation measures such as assurance of strict anonymity of information given and voluntary consent of participation as well as free exit from participation at any stage were available. Additionally, ample information about the survey and/or interview aims relative to potential inputs for policy design was provided to participants. Further, the SAMSS survey is a state survey with a very high reputation in South Australia. Hence, participants are less likely to give false information. Moreover, other crucial determinants of health services utilisation such as actual income levels and other socio-cultural factors (Andersen, 1995; Anderson, 1999; Marmot & Allen, 2014) were not accounted for in the current analysis. More in-depth analysis is warranted to delineate particularly,

the relationship between mental health problems and primary health care service use (Eckert et al., 2004). Future studies may account for these possible limitations and replicate the thesis findings.

Third, the views of healthcare professionals was not stratified based on professional backgrounds from the focus group interviews (study 4). It is plausible that if the views of the participants were analysed separately, differences in perceptions or contradictions may have occurred. However, the study aimed to explore unmet healthcare needs, barriers, and enablers in accessing health services from the perspectives of demand and supply in a composite manner. Separate analysis of interview transcripts has the potential to bring out all the minute details of participants' views that may have been blurred in a composite presentation of the participants perceptions. More qualitative studies will be necessary to explore this and other relevant details to contribute information and potentially shape policy by providing a forum in which older people and rural health practitioners can voice unique issues related to the rural healthcare system. Last, only two general practitioners participated in the study, possibly due to busy schedules and time constraints. Being the frontline providers in rural health systems, more representation of GPs will be beneficial in future studies. However, a separate focus discussion was conducted with the GPs, allowing ample time to adequately capture their perspectives on the topic.

8.6 Further Research Agenda

It is believed that the findings of this thesis make invaluable clinical and policy contributions towards the health and general well-being of the ageing population. However, one direction for future research would be longitudinal studies that would offer valuable insights into the factors that have a causal impact on the utilisation of health services by rural older individuals. Although some longitudinal evidence on women's and men's health in Australia exists, further longitudinal analyses primarily focusing on rural older populations are warranted. Studies examining health-seeking determinants that result in improved health outcomes would also offer critical insights into the use of services by rural older people. Similarly, research examining rural older adults' utilisation of health services through models that focus on the process of health-seeking (Goldberg & Huxley, 1980; Pescosolido, 1992) and the psychological dimensions of services uptake (Ajzen, 1985; Rosenstock, 1966) will contribute further to the understanding of services use among the ageing population.

As indicated earlier, this research focused on older adults in South Australia and therefore the findings may not be generalisable to the ageing population in Australia as a whole. It will be interesting to validate this study's results with a dataset pooled from various Australian states and territories to further explore issues reported in this thesis. Such analysis could particularly prioritise the underlying

mechanism of mental health and other specialised services use among rural older adults. This would help in developing a fuller understanding and assist the prediction of future dynamics of general well-being in late life which could provide data-informed policy development. The findings of the current study could serve as a form of blueprint for further research, providing leads and foci for examination. Particularly, future studies may adopt mixed methods approach to validate the rural-urban disparities in speciality care use evidenced in this study. The relationship between psychological distress, multimorbidity and health services use in rural areas needs further investigations.

Given the observation that rural older adults use speciality care services at lower levels compared to their urban counterparts, further analysis is warranted to clarify whether this is so due to the cost-effective practice of rural GPs to save older people from expensive specialist referrals or other rural-specific factors. An interesting question arising from this thesis that future studies should probe is whether lower use of specialised care services is related to levels of multimorbidity and poor health outcomes in rural environments. Relative to independent associations observed between physical and mental health conditions and high GP visits (Study 1-Chapter 4), and the relationships between psychological distress, multimorbidity and health services use (Study 3-Chapter 6), future studies are to target optimal care models capable of holistically addressing older patients' care needs. Such studies should consider psychosocial interventions in GP settings in any proposed integrated care model. Again, the findings of this project reinforce the urgent need for improved primary healthcare interventions to reduce the care demand on rural clinicians. In this regard, intervention studies on suitable primary care services and how these could be effectively delivered to the ageing population in rural areas are warranted. Further, pragmatic policy response based on population size in rural and remote areas as well as consideration of other possible service delivery models such as fly-in/fly out and telehealth services may be helpful in meeting care needs of rural older patients.

8.7 Conclusions

The present thesis contributes knowledge on care needs and the use of health services by chronically ill older adults in rural South Australia. Among the main findings reported herein are: physical and mental health conditions in older adults are independently associated with frequent general practitioner visits; rural older adults with mental health problems are more likely to seek help from general practitioners than their urban counterparts. Concerning factors associated with medical speciality services use, it was observed that rural older adults were less likely to use speciality care services compared to those in urban areas and that indicators of enabling resources and need for services were strongly associated with speciality services use. Moreover, multimorbidity was found to be associated with severe psychological distress and both multimorbidity and psychological

distress demonstrated independent associations with higher healthcare demand. While increasing age showed an association with complex multimorbidity, high psychological distress was less prevalent in the oldest old. Finally, rural older adults with complex health conditions are often confronted with four broad ranges of unmet needs, namely, chronic disease management care, specialist care, psychological care, and formal care. Many access barriers emerged to have contributed to the unmet care needs, however, some potential facilitators could be leveraged to improve access to healthcare services for older adults. Taken together, the findings of this research project provide a significant baseline contribution to shape both future research and public health policy development aimed at promoting rural health services access and use in later life.

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APPENDICES

SAPHS

South Australian Population Health Survey

QUESTIONNAIRE 2020

Government of South Australia

SA Health

Note: Bold text denotes 'read out'

A. Demographics (1)

All ages

A1. As this is a survey about health, can you tell me your/NAME's age please?

(Single Response)

1._____(RANGE 0 – 120)
2. Not stated
3. Don't know

Sequence Guide: If A1=1 (age), go to A3

A2. Which age group are you/name in? Would it be...

(Single response)

1. Under 2 years
2. 2 to 4 years
3. 5-15 years
4. 16 or 17 years
5. 18 to 24 years
6. 25 to 34 years
7. 35 to 44 years
8. 45 to 54 years
9. 55 to 64 years
10. 65 to 74 years
11. 75 years or over
12. Prefer not to say *(End interview)*

A3. Are you…

(Single response)

1. Male
2. Female
3. Other SPECIFY _____

A4. How many <u>people aged 18 or over</u> live in this household?

(Enter number)

1._____(RANGE 1-20)
2. Not stated (999)

A5. How many children under 18 years live in your household?

(Enter number).

1._____(RANGE 1-20)
2. Not stated (999)

B. Overall Health Status

5 years and over

B1. In general, would you say that your/NAMEs health is:

(Single Response)

1. **Excellent**
2. **Very good**
3. **Good**
4. **Fair**
5. **Poor**
6. Don't know
7. Prefer not to say

C. Health Care Utilisation

All ages

C1. In the last 12 months, how many times have you/NAME used these health services in South Australia?

(Enter number of times)

1. **GP**
2. **Specialist Doctor**
3. **Dentist**
4. **Other health professional (Note: allied health, nursing, Aboriginal health worker)**
5. **Hospital admission (in-patient)**
6. **Hospital Outpatient Clinic**
7. **Hospital Emergency/casualty department**
8. Prefer not to say

All ages

C2. Apart from Medicare, are you (your child) currently covered by private health insurance?

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

18 years and over

The next few questions are about the public health system in South Australia. This includes public hospitals as well as other health services such as pathology, pharmacy, ambulance, breast screen, drugs and alcohol, dental and mental health services to name a few. So, thinking about the public health system in South Australia….

If you became seriously ill, how confident are you that you would:

C3. Get quality and safe medical care?

(Single response)

1. **Not at all confident**
2. **Not very confident**
3. **Somewhat confident**
4. **Very confident**
5. Don't know
6. Refused

C4. Receive the most effective medication?

(Single response)

1. **Not at all confident**
2. **Not very confident**
3. **Somewhat confident**
4. **Very confident**
5. Don't know
6. Refused

C5. Receive the best medical technology?

(Single response)

1. **Not at all confident**
2. **Not very confident**
3. **Somewhat confident**
4. **Very confident**
5. Don't know
6. Refused

C6. Be able to afford the care you need

(Single response)

1. **Not at all confident**
2. **Not very confident**
3. **Somewhat confident**
4. **Very confident**
5. Don't know
6. Refused

C7. Which of the following statements come closest to expressing your overall view of the public health care system in South Australia?

(Single response)

1. **Our health care system has so much wrong with it that we need to completely rebuild it**
2. **There are some good things about our health care system, but fundamental changes are needed to make it work better**
3. **On the whole the system works pretty well and only minor changes are needed to make it work better**
4. Don't know
5. Refused

D. Country Health

All ages

The next few questions are about people who have had to travel long distances to access a health service within South Australia.

D1. In the last 12-months did you/Name travel over 75kms to use a health service?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

Sequence Guide: If D1 >1 go to next section

D2. What was the reason you travelled over 75kms to use this health service? If you have /NAME has done this more than once, please answer for the most recent occasion.

(Select as many as apply)

1. **Earlier appointment or service available**
2. **Service not available in home community**
3. **Referred by GP**
4. **Family support available**
5. **Own choice (to use particular health professional or service)**
6. **Other (specify)**
7. Don't know
8. Prefer not to say

D3. How did you/NAME travel to this service?

(On the most recent occasion if more than once. select as many as apply)

1. **Private car – own car**
2. **Private car – someone else's car**
3. **Bus**
4. **Plane**
5. **Royal Flying Doctor Service**
6. **Health/Medical bus (PATS – Patient Assistance Transport Scheme)**
7. **Ambulance**
8. Other (specify)
9. Don't know
10. Prefer not to say

The next question is about rating the access to the health service that you/NAME travelled to.

D4. On a scale of 1 to 5 where 1 means 'very difficult' and 5 means 'very easy', how easy was it for you to get to this health service?
(Single response)

1. **1 = very difficult**
2. **2 = difficult**
3. **3 = neutral**
4. **4 = easy**
5. **5 = very easy**
6. Don't know
7. Prefer not to say

Sequence Guide: If D4 = 1 or 2 go to D5.
Else go to next section

D5. What was the main difficulty in getting to this health service?
(Select as many as apply)

1. **Health services was too far from home**
2. **Transport issues (e.g. no access to car, no-one to take them)**
3. **Financial considerations**
4. **Waiting time too long**
5. **Accommodation issues for themselves or family/friends**
6. **Lack of support for family members while in hospital**
7. **Other (specify)**
8. Don't know
9. Prefer not to say

E. Chronic Conditions

2+ years

E1. Has a doctor or nurse ever told you/NAME that you have/NAME has diabetes?

(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

Sequence guide: If E.1 >1 go to E7.
If E1 = 1 and A3 = 2 (female), go to E2.

Females 16+ only

E2. Were you/Name pregnant when you/name were first told you/name had diabetes?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

Sequence guide: If E2 = 1, go to E3

Females 16+ only

E3. Have you/has NAME ever been told by a doctor or nurse that you/NAME had diabetes other than when you were/NAME was pregnant?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

2+ years

E4. Have you/Has NAME got diabetes now?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

Sequence guide: If E4 >1 go to E7

2+ years

E5. What type of diabetes were you /NAME told you/NAME has?

IF E2 = 1 Show **Other than diabetes at the time of pregnancy**
(Single response)

1. **Type 1**
2. **Type 2**
3. Other (specify)
4. Don't know
5. Prefer not to say

2+ years

E6. How do you/does NAME currently treat your/their diabetes?
(Select as many as apply)

1. **Insulin**
2. **Tablets**
3. **Diet**
4. **Exercise**
5. Other (specify)
6. Don't know
7. Prefer not to say

2+ years

E7. Has a doctor or nurse ever told you/NAME that you have/NAME has asthma?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

Sequence guide: If E7>1 go to E11

2+ years

E8. Symptoms of asthma include coughing, wheezing, shortness of breath and chest tightness. Have you/has name had any symptoms of asthma or taken treatment for asthma in the last 12 months?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

2+ years

E9. Do you/does name still have asthma?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

2+ years

E10. Do you/Does NAME have a written asthma action plan, that is, written instructions of what to do if the asthma is worse or out of control?
(Single response)

1. **Yes**
2. **No**
3. Never heard of one
4. Don't know
5. Prefer not to say

16+ years

E11. Has a doctor or nurse ever told you/NAME that you have/NAME has chronic bronchitis or emphysema that has lasted 6 months or more?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

All ages. Children aged 0-17 only have response options of heart disease and stroke

E12. Have (has) you (your child) ever been told by a doctor or nurse that you (he/she) have any of the following conditions?
(Select as many as apply)

1. **Heart attack**
2. **Angina**
3. **Heart Disease***
4. **Stroke**
5. **TIA or 'mini stroke' (Transient Ischaemic attack)**
6. None of the above
7. Prefer not to say

* Heart Disease may include congenital, rheumatic, coronary, peripheral arterial disease, peripheral vascular disease, heart arrhythmia, cardiomyopathy.

2+ years

E13. Has a doctor or nurse ever told you/NAME that you have/NAME has arthritis? And if so, what type?
(Select as many as apply)

1. **Yes - Osteoarthritis**
2. **Yes – Rheumatoid Arthritis**
3. **Yes – Gout**
4. **Yes – Other type (specify)**
5. **Yes – Don't know what type**
6. No – Don't have arthritis
7. Don't know
8. Prefer not to say

16+ years

E14. Has a doctor or nurse ever told you/NAME that you have/NAME has osteoporosis?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

All ages

E15. Has a doctor or nurse ever told you/NAME that you have/NAME has cancer?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

F. Cancer Screening and Prevention

All ages

F1. The next question is about sun exposure. A sunburn is any reddening of one's skin that lasts longer than 12 hours after exposure to the sun. In the last 12-months has any part of your/NAME's body been sunburned?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

F2. Do you /does NAME do any of the following during summer or when the sun is out?
(Select as many as apply)

1. **Wear sunglasses**
2. **Wear a broad brimmed hat**
3. **Wear clothing to protect yourself from the sun (i.e. long sleeves, collars, long pants)**
4. **Use SPF 30+ sunscreen or face moisturiser that includes SPF 30+**
5. **Seek shade**
6. None of the above
7. Prefer not to say

G. Disability and Carers

All ages

The next question is about disability, that is, a limitation, restriction or impairment which has lasted, or is likely to last more than 6-months and restricts every day activities.

G1. Do you/does Name have a disability?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

16+ years

G2. Do you /Does Name provide any long-term care for a parent, partner, child, other relative or friend who has a disability, is aged 65 years or over or who has a chronic mental or physical illness?
By long-term care we mean a minimum of 6-months and may extend to years

(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

H. Biomedical Risk Factors

16+ years

H1. Has a doctor or nurse ever told you/NAME that you have/NAME has high blood pressure?
(Single response)

1. **Yes**
2. **Yes – but medication has now addressed it**
3. **Yes – but it was only during pregnancy (female only)**
4. **Yes – but it was only temporary**
5. **No**
6. Don't know
7. Prefer not to say

16+ years

H2. When did you last have your blood pressure measured by a health professional?
(Single response)

1. **0-3 months**
2. **4-6 months**
3. **7-12 months**
4. **13 months – 2 years**
5. **More than 2 years ago**
6. **Never Measured**
7. Don't know
8. Prefer not to say

Sequence guide: If H1=1 or 2, go to H3.

16+ years

H3. How do you/does NAME currently treat your high blood pressure?
(Select as many as apply)

1. **Prescribed medication (tablets)**
2. **Healthy eating**
3. **Being physically active**
4. **Trying to lose/maintain a healthy weight**
5. **Other (specify)**
6. **No treatment**
7. Don't know
8. Prefer not to say

16+ years

H4. Has a doctor or nurse ever told you/NAME that you have /NAME has high cholesterol?

(Single response)

(Probe: if respondent does not have high cholesterol anymore because they are taking medication, code as yes)

1. **Yes**
2. **Yes – but medication has now addressed it**
3. **Yes – but it was only temporary**
4. **No**
5. Don't know
6. Prefer not to say

16+ years

H5. When did you last have your cholesterol measured by a health professional?

(Single response)

1. **0-3 months**
2. **4-6 months**
3. **7-12 months**
4. **13 months – 2 years**
5. **More than 2 years ago**
6. **Never measured**
7. Don't know
8. Prefer not to say

Sequence guide: If H4=1 or 2 to go H6.

16+ years

H6. How do you/does NAME currently treat your/their high cholesterol?
(Select as many as apply)

1. **Prescribed medication (tablets)**
2. **Healthy eating**
3. **Being physically active**
4. **Trying to lose/maintain a healthy weight**
5. **Other (specify)**
6. **No treatment**
7. Don't know
8. Prefer not to say

All ages

H7. What is your/Names height without shoes?
(Single response)

1. ____Centimeters
2. ____Feet
3. ____Inches
4. Don't know
5. Prefer not to say

All ages

H8. What is your (your child's) weight? (undressed in the morning)
(Single response)

1. ____Kilograms range
2. ____Stones
3. ____Pounds
4. Don't know
5. Prefer not to say

I. Protective Factors

5-17 years

I1. How many days in the past week did NAME do any vigorous or moderate physical activity for a total of at least 60 minutes? This could include active transportation, leisure, active play, organised and non-organised sport, games, physical education and other activities at home, school or the community.
(Single response)

1. ____Enter number of days
2. None
3. Don't know
4. Prefer not to say

65+ years

I2. How many days in the past week did you/NAME do any moderate physical activity for a total of at least 30 minutes? This could include brisk walking, golf, dancing, or garden work and household chores.
(Single response)

1. ____Enter number of days
2. None
3. Don't know
4. Prefer not to say

18+ years

I3. In the last week how many times have you/NAME walked continuously for at least 10 minutes for fitness, recreation, sport or to get to and from places?
(Single response)

1. ____Enter number of times
2. None
3. Don't know
4. Prefer not to say

Sequence guide: If I3 > 1 go to I5

18+ years

I4. What do you estimate was the total time that you (your child) spent walking in this way in the last week?
(Single response)

1. ____hours
2. ____minutes
3. Don't know
4. Prefer not to say

18+ years

I5. This question excludes household chores or gardening. In the last week, how many times did you/NAME do any vigorous physical activity which made you breathe harder or puff and pant? (e.g. tennis, jogging, cycling, keeping fit exercises)
(Single response)

1. ____Enter number of times
2. None
3. Don't know
4. Prefer not to say

Sequence guide: If I5 > 1 go to I7

18+ years

I6. What do you estimate was the total time that you/NAME spent doing this vigorous activity in the last week?
(Single response)

1. ____hours
2. ____minutes
3. None
4. Don't know
5. Prefer not to say

18+ years

I7. This question excludes household chores or gardening. In the last week, how many times did you do any moderate physical activity that you have not already mentioned? (e.g. lawn bowls, golf, gentle swimming)
(Single response)

1. ____Enter number of times
2. None
3. Don't know
4. Prefer not to say

Sequence guide: I7 >1 go to I9

18+ years

I8. What do you estimate was the total time that you/NAME spent doing this moderate activity in the last week?
(Single response)

1. ____hours
2. ____minutes
3. None
4. Don't know
5. Prefer not to say

5+ years

I9. Some activities are designed to increase muscle strength or tone, such as lifting weights, resistance training, pull-ups, push-ups or sit-ups. Including any activities already mentioned, on how many days in the last week did you/NAME do any strength or toning activities?
(Single response)

1. ____Enter number of days
2. None
3. Don't know
4. Prefer not to say

5-17 years

I10. The following questions relate to screen-based activities which include the use of TV, tablets, computers, smartphones and electronic games. The questions do not relate to screen use for school or education purposes. On a typical <u>weekday</u> how many hours do you /does NAME use electronic media (screen time) for entertainment?
(Single response)

1. ____hours
2. ____minutes
3. None
4. Don't know
5. Prefer not to say

5-17 years

I11. On a typical <u>weekend day</u> how many hours do you /does NAME use electronic media (screen time) for entertainment?
(Single response)

1. ____hours
2. ____minutes
3. None
4. Don't know
5. Prefer not to say

All ages

I12. On average, how many hours per day do you /does NAME spend sleeping?
(Single response)

1. ____hours
2. ____minutes
3. Don't know
4. Prefer not to say

1+ years

I13. How many serves of vegetables do you /does NAME usually eat each day?

A 'serve' is ½ cup cooked vegetables or 1 cup of salad.
(Single response)

1. None (don't eat vegetables)
2. Less than one serve
3. Enter number of serves
4. Don't know
5. Prefer not to say

1+ years

I14. The next question is about eating fruit, which includes fresh, dried, frozen and tinned fruit.nHow many serves of fruit do you /does NAME usually eat each day?

A 'serve' is 1 medium piece or 2 small pieces of fruit, 1 cup diced pieces or 1 tablespoon of dried fruit
(Single response)

1. None (don't eat fruit)
2. Less than one serve
3. Enter number of serves
4. Don't know
5. Prefer not to say

1+ years

I15. How many times a week on average do you /does NAME have meals or snacks such as burgers, pizza, chicken or chips from places like McDonalds, Hungry Jacks, KFC, Dominos, or your local take-away?
(Single response)

1. ____number of times per day
2. ____number of times per week
3. ____number of times per month
4. Rarely (less than once per month)
5. Never
6. Don't know
7. Prefer not to say

1+ years

I16. How many times a week on average do you/does NAME have snacks like chocolate, lollies, cake, donuts, pastries crisps, ice-cream and sweet or savoury biscuits?
(Single response)

1. ____number of times per day
2. ____number of times per week
3. ____number of times per month
4. Rarely (less than once per month)
5. Never
6. Don't know
7. Prefer not to say

1+ years

The next few questions are about how many glasses of tap water, soft drinks and energy drinks, and flavoured milks that you drink /NAME drinks in a day. On an average day how much ….. do you drink?

I17. On an average day, how much tap water do you/does NAME usually have? This includes pura-tap/water filters and if tap water is used to make cordial, coffee and tea.
(Single response)

1. ____number of glasses
2. ____mls
3. ____litres
4. None
5. Don't know
6. Prefer not to say

I18. On an average day, how much diet or 'sugar-free; soft drinks, sports drinks or energy drinks do you/does NAME usually have?

(Single response)

1. ____number of glasses
2. ____mls
3. ____litres
4. None
5. Don't know
6. Prefer not to say

I19. On an average day, how much soft drink, sports drink or energy drinks do you/ does NAME usually have? (excludes sugar-free drinks)

(Single response)

1. ____number of glasses
2. ____mls
3. ____litres
4. None
5. Don't know
6. Prefer not to say

I20. On an average day, how much flavoured milk do you/ does NAME usually have? (includes iced-coffee, milo, milkshakes)

(Single response)

1. ____number of glasses
2. ____mls
3. ____litres
4. None
5. Don't know
6. Prefer not to say

2+ years

I21.How often do you/does NAME brush your/their teeth or dentures with toothpaste?
(Single response)

1. **Less than once a day**
2. **Once a day**
3. **Twice a day**
4. **More than twice a day**
5. Don't know
6. Prefer not to say

J. Behavioural Risk Factors

16+ years

J1. Now for some questions about smoking. Do you /does NAME currently smoke cigarettes, cigars, pipes or any other tobacco products
(Single response)

1. **Daily**
2. **At least weekly (not daily)**
3. **Less often than weekly**
4. **Not at all**
5. Prefer not to say

J2. Over your /NAME's lifetime would you /they have smoked at least 100 cigarettes or a similar amount of tobacco?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

Sequence guide: If J1 = 1-3 or J2 = 1, go to J3

J3. During the past 3-months, have you seen any TV advertising about tobacco smoking?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

J4. During the past 3-months, have you seen any online advertising about tobacco smoking?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

Sequence guide: If J3 or J4 = 1, go to J5

J5. Please describe the ads?
(Multiple response)
Note: Identify the ad without aiding awareness. Continue to probe - 'anything else?'

1. Quit campaign/quit smoking/dangers of smoking
2. Dying man in his home with oxygen tube - It's never a perfect time to quit (best intentions)
3. Multiple attempts to quit (Never give up Giving up)
4. Black and white ad, Gary talks about how he quit for his kids (Real story – Gary)
5. Biker with emphysema and an oxygen tube (Mick's story)
6. Woman (Terrie) with throat cancer and a wig who later died (Terrie)
7. Cartoon about triggers for smoking (triggers)
8. 'You know smoking causes all these diseases' – images of a tar sponge, brain clot, gangrene, artery (many diseases)
9. Quitters give a message to every smoker 'Please don't smoke around me while I'm quitting' (From Every Quitter)
10. Smoking causes 16 cancers (16 Cancers)
11. Young man grows older and doesn't quit when he says he will 'e.g. I'll quit before I wake up coughing' (Quit Stalling)
12. Man coughs into handkerchief and realises there is blood on it (Cough)
13. Cancer causing mutations form within the chest of a man (Mutations)
14. Nicotine replacement therapy ad
15. Other (specify)
16. Don't know
17. Prefer not to say

The next few questions refer to 'standard drinks'. A standard drink varies according to type of alcohol (i.e. beer, wine, spirits) and the form it comes in (schooner, stubbie, can, bottle, cask etc.).

In the following questions would you let me know what type and form of alcohol you are referring to in order to calculate the number of standard drinks you consume.

J6. In the last 12 months, how often did you have an alcoholic drink of any kind
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Not in the last 12 months (NS)
9. No longer drink (Go to J8)
10. Never drunk alcohol (NS)
11. Prefer not to say (NS)

Sequence guide: If J6= 8, 10 or 11, go to next section. If J6=9 go to J8.

J7. On a day that you have an alcoholic drink, how many standard drinks do you usually have?
(Single response)

1. 20 or more drinks
2. 16-19 drinks
3. 13-15 drinks
4. 9-10 drinks
5. 7-8 drinks
6. 5-6 drinks
7. 3-4 drinks
8. 2 drinks
9. 1 drink
10. Half a drink
11. Don't know
12. Prefer not to say

J8. In the last 12 months, how often did you have 20 or more standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J9. In the last 12 months, how often did you have 11-19 standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J10. In the last 12 months, how often did you have 7-10 standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J11. In the last 12 months, how often did you have 5-6 standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J12. In the last 12 months, how often did you have 3-4 standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J13. In the last 12 months, how often did you have 1-2 standard drinks in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J14. In the last 12 months, how often did you have less than one standard drink per day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

J15. In the last 12 months, how often did you have no alcohol in a day?
(Single response)

1. Every day
2. 5-6 days a week
3. 3-4 days a week
4. 1-2 days a week
5. 2-3 days a month
6. About 1 day a month
7. Less often
8. Never
9. Don't know
10. Prefer not to say

K. Food Security

All ages

K1. In the last 12-months, were there any times that you/NAME ran out of food and you couldn't afford to buy more?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

Sequence guide: If K1 >1 go to next section

K2. How often did this happen?
(Single response)

1. ____times per week
2. ____times per month
3. ____times per year
4. Rarely
5. Don't know
6. Prefer not to say

L. Mental Health

5+ years

L1. In the last 12 months, how many times have you/has NAME used these health services in South Australia?
(Answer for each)

1. ___**Psychologist**
2. ___**Psychiatrist**
3. ___**Other community mental health services**
4. ___**Online/phone services (self-help)**
5. Prefer not to say

5-15 years

L2. Has a doctor or health professional ever told you NAME has any of the following conditions?
(Select as many as applicable)

1. **Depression**
2. **ADHD – Attention Deficit Hyperactivity Disorder**
3. **Conduct Disorder**
4. **Anxiety (including social phobia, separation anxiety, OCD or generalized anxiety)**
5. **Other mental health condition (specify)**
6. None
7. Don't know
8. Prefer not to say

Note: A conduct disorder is a *behavioural problem in children and adolescents which may involve aggression (for example, towards authority figures, other children, and animals) and law-breaking tendencies (for example, stealing, lighting fires, breaking into houses and vandalism)*

Sequence guide: If L2 >5 go to L4

5-15 years

L3. Is NAME currently receiving treatment for any mental health concerns? What form of treatment is that?
(Select as many as applicable)

1. **Yes - Medication**
2. **Yes – Health professional (i.e. psychologist, psychiatrist, GP)**
3. **Yes – Counsellor**
4. **Yes – Online/Phone resources (self-help)**
5. **Yes – Other (specify)**
6. None
7. Don't know
8. Prefer not to say

5-18 years

L4. Have you /has NAME ever been suspended from school?
(Single response)

1. **Yes**
2. **No**
3. Don't know
4. Prefer not to say

16+ years

L5. In the last 12 months, have you/Has NAME ever been told by a doctor that you have any of the following conditions?
(Select as many as applicable)

1. **Anxiety**
2. **Depression**
3. **A stress related problem**
4. **Any other mental health problem**
5. None
6. Don't know
7. Prefer not to say

Sequence guide: L5 > 4 go to L7

16+ years

L6. Are you/is NAME currently receiving treatment for anxiety, depression, stress related problems or any other mental health problem?
(Select as many as applicable)

1. **Yes - Medication**
2. **Yes – Health professional (i.e. psychologist, psychiatrist, GP)**
3. **Yes – Counsellor**
4. **Yes – Online/Phone resources (self-help)**
5. **Yes – Other (specify)**
6. None
7. Don't know
8. Prefer not to say

18+ years

The next questions are about how you have been feeling in the last 4 weeks. Some of the questions might make you feel uncomfortable so you don't have to answer them if you don't want to.

L7. In the past four weeks, about how often did you feel tired out for no good reason?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L8. In the past four weeks, about how often did you feel nervous?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

Sequence guide: If L8>4, go to L10

L9. In the past four weeks, about how often did you feel so nervous that nothing could calm you down?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L10. In the past four weeks, about how often did you feel hopeless?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L11. In the past four weeks, about how often did you feel restless or fidgety?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

Sequence guide: If L11>4 go to L13

L12. In the past four weeks, about how often did you feel so restless you could not sit still?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L13. In the past four weeks, about how often did you feel depressed?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L14. In the past four weeks, about how often did you feel everything was an effort?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L15. In the past four weeks, about how often did you feel so sad that nothing could cheer you up?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

L16. In the past four weeks, about how often did you feel worthless?
(Single response)

1. **All of the time**
2. **Most of the time**
3. **Some of the time**
4. **A little of the time**
5. **None of the time**
6. Don't know
7. Refused

18+ years

Now I'm going to ask you some questions about suicide. Remember that if you feel uncomfortable, you don't have to answer these questions.

L17. In the past 12 months have you considered suicide?
(Single response)

1. Yes
2. No
3. Refused

Sequence guide: If L17 >1 go to next section

L18. Did you seek (or are you seeking) professional help for this?
(Single response)

1. Yes
2. No
3. Refused

Sequence guide: If L18 =2 go to L19. Else go to L20.

L19. Why did you not seek professional help?
(Select as many as applicable)

1. Did not know who to contact
2. Stigma/embarrassment
3. Concerned about privacy
4. Did not feel I needed help
5. I had other supports
6. Other (specify)
7. Refused

L20. What did you do at the time, or have you done since that time that helped your wellbeing?
(Open response)

If you feel distressed following this call or these questions have caused you concern, you may find it helpful to contact the following support services for support:

Lifeline – 13 11 44

Adult Mental Health Service – 13 14 65

M. Wellbeing

16+ years

The next few questions are about how you rate your general wellbeing. On a scale of 0 to 10, where 0 means 'not at all' and 10 means 'completely'….

M1. Overall, how satisfied are you with your life nowadays?
(Single response)

1. ____ Enter number
2. Don't know
3. Refused

M2. Overall, to what extent do you feel the things you do in your life are worthwhile?
(Single response)

1. ____Enter number
2. Don't know
3. Refused

M3. Overall, how happy did you feel yesterday?
(Single response)

1. ____Enter number
2. Don't know
3. Refused

M4. Overall, how anxious did you feel yesterday?
(Single response)

1. ____Enter number
2. Don't know
3. Refused

N. Disadvantage and Inequity

16+ years

We know that people of different social and economic backgrounds can have different health outcomes. Some of these next few questions may seem personal, but they will help us understand how these issues affect the health of South Australians. Remember, all responses are confidential and you don't have to answer the questions if you don't want to.

N1. Which one of the following options best describes how you think of yourself?
(Single response)

1. **Straight**
2. **Gay or lesbian**
3. **Bisexual**
4. **Other (specify)**
5. Don't know
6. Prefer not to say

N2. In the last 12 months, have you /has NAME experienced discrimination or been treated unfairly because of your /their racial, ethnic, cultural or religious background?
(Single response)

1. Never
2. Less than once a year
3. A few times a year
4. A few times a month
5. At least once a week
6. Almost every day
7. Don't know
8. Prefer not to say

N3. Have you / has NAME ever been discriminated against because of your:
(Select all that apply)

1. **Religion**
2. **Race**
3. **Sexual Orientation**
4. **Gender**
5. **Age**
6. **Disability**
7. **Other (specify)**
8. None
9. Don't know
10. Prefer not to say

N4. What types of transport do you /does NAME routinely have available to get to and from places like medical appointments, recreational facilities, visiting friends and family, shopping or going to the supermarket?
(Select as many as applicable)

1. Own car (household car)
2. Someone else's car
3. Bus (public transport)
4. Train (public transport)
5. Bicycle
6. Tram
7. Taxi
8. Motorcycle
9. Walk
10. Other (specify)
11. None
12. Don't know
13. Prefer not to say

N5. If suddenly you had / NAME had to get $2,000 for something important, could you/NAME get the money within a week?
(Single response)

1. Yes
2. No
3. Don't know
4. Prefer not to say

O. Demographics (2)

Now to finish with some general questions.

All ages

O1. What town or suburb do you/NAME live in?

(Single response)

1. ____Enter town/suburb
2. Not stated

18+ years

O2. Which of the following best describes your /NAMEs current marital status?

(Single response)

1. **Married**
2. **Living with a partner**
3. **Separated**
4. **Divorced**
5. **Widowed**
6. **Never Married**
7. Prefer not to say

16+ years

O3. Which of these best describe your /NAMES current employment status?

(Single response)

1. **Full-time employed (permanent/contract) including self employed**
2. **Part-time employed (permanent/contract) including self employed**
3. **Casual**
4. **Unemployed**
5. **Engaged in home duties**
6. **Student**
7. **Retired**
8. **Unable to work**
9. **Carer**
10. **Volunteer work**
11. Other (Specify)
12. Don't know
13. Prefer not to say

16+ years

O4. Do you /does NAME receive any of the following pension benefits?

(Select as many as applicable)

1. **Aged /widow's pension**
2. **Service or defence/ War widow's/ Repatriation Pension**
3. **Invalid/Disability Pension**
4. **Unemployment Benefits**
5. **Sickness Benefits**
6. **Family or parenting benefit**
7. **AUSTUDY/student allowance**
8. **Carer allowance**
9. Other (*specify*)
10. None
11. Prefer not to say

All ages

O5. In which country were you /NAME born?

(Single response)

1. Australia
2. Afghanistan
3. Austria
4. Bosnia-Herzegovina
5. Canada
6. China
7. Croatia
8. Egypt
9. Lebanon
10. France
11. Germany
12. Greece
13. Holland / Netherlands
14. Hungary
15. Iran
16. India
17. Italy
18. Malaysia
19. Malta
20. New Zealand
21. Philippines
22. Poland
23. Slovenia
24. South Africa
25. UK or Ireland
26. USA
27. Vietnam
28. Former Yugoslav
29. Other country (*specify*) _____
30. Not stated/Refused

All ages

O6. Are you / is NAME of Aboriginal or Torres Strait Islander origin?

(Single response)

1. No
2. Aboriginal
3. Torres Strait Islander
4. Aboriginal and Torres Strait Islander
5. Prefer not to say

All ages

O7. Are any other members of your /NAME's household of Aboriginal or Torres Strait Islander origin?

(Single response)

1. ___Enter number of adults
2. ___Enter number of children
3. None
4. Don't know
5. Prefer not to say

Sequence guide: If O6 =2-4 go to O8 and O9. Else go to O10.

All ages

O8. Do you /Does NAME speak any (enter O6) languages?

(Single response)

1. Yes
2. Yes, some words only
3. No
4. Prefer not to say

All ages

O9. In the last 12-months, have you /has NAME gone to or been involved in any of these Aboriginal and Torres Strait Islander cultural activities or ceremonies?

(Select as many as applicable)

1. **Ceremonies**
2. **Funeral/sorry business**
3. **NAIDOC Week activities**
4. **Sport Carnivals (excluding NAIDOC week activities)**
5. **Festivals or carnivals involving arts, crafts, music or dance (excluding NAIDOC week activities)**
6. **Been involved in any Aboriginal or Torres Strait Islander Organisations**
7. None of the above
8. Prefer not to say

All ages

O10. What is the main language you speak /NAME speaks at home?

(Single response)

1. English
2. Italian
3. Greek
4. Mandarin
5. Vietnamese
6. Cantonese
7. Arabic
8. German
9. Polish
10. Spanish
11. Punjabi
12. Hindi
13. Other (specify)

14. Prefer not to say

16+ years

O11. What is the highest level of education you have /NAME has completed?

(Single response)

1. Never attended school
2. Some primary school
3. Completed primary school
4. Some high school
5. Completed high school
6. TAFE, Trade or certificate
7. Diploma, advanced diploma
8. University or some other tertiary degree
9. Other (specify)
10. Prefer not to say

All ages

O12. The next question is about housing. Is where you live /NAME lives…

(Single response)

1. **Owned or being purchased by the occupants**
2. **Rented from the Housing SA**
3. **Rented privately**
4. **Retirement village**
5. Other (specify)
6. Prefer not to say

All ages

O13. What is the approximate annual gross income of your /NAME' household? This is, before tax is taken out.

(Single response)

1. **Up to $12,000**
2. **$12,001 - $20,000**
3. **$20,001 - $40,000**
4. **$40,001 - $60,000**
5. **$60,001 - $80,000**
6. **$80,001 - $100,000**
7. **$100,001 - $150,000**
8. **$150,001 - $200,000**
9. **More than $200,000**
10. Not stated/Prefer not to say
11. Don't know

Government of South Australia
SA Health

SA Department for Health and Wellbeing
Human Research Ethics Committee

Citi Centre Building
Level 5, 11 Hindmarsh Square
Adelaide SA 5000

PO Box 287, Rundle Mall
Adelaide SA 5000
DX 243

Tel 08 8226 7702

02 November 2018

Dr Elena Rudnik
Flinders Rural Health
Flinders University
23-25 Railway Tce
Nuriootpa SA 5355

Dear Dr Rudnik

HREC reference number: HREC/18/SAH/89
Project title: *Health Status and Service Use of Rural and Remote Communities*

RE: HREC/18/SAH/89 - Ethics Application Approval

Thank you for submitting the above project for ethical and scientific review. The application was considered by a sub-committee of the SA Department for Health and Wellbeing Human Research Ethics Committee (HREC) on 26 October 2018.

The application was considered low risk, and expedited as per Section 5.1.19 of the *National Statement on Ethical Conduct in Human Research.*

I am pleased to advise that your submission has been granted full ethics approval and meets the requirements of the NHMRC *National Statement on Ethical Conduct in Human Research* and the *Australian Code for the Responsible Conduct of Research*. The documents reviewed and approved include:

Document	*Version*	*Date*
Application: HREA (signed)	AU/1/2CA8310	20 September 2018
Covering Letter: *Noting that sites approved do not include Flinders University as requested*	-	20 September 2018
LNR Checklist Assessment	-	-
Protocol	1.0	03 September 2018

The documents reviewed and acknowledged include:

Document	*Version*	*Date*
SAMSS Questionnaire	1.0	2016
Data Custodian Support (SAMSS data): *Katina D'Onise, SA Department for Health and Wellbeing*	-	06 August 2018
Letter of Support: *Talia Blythman, Project Officer, Steps to Better Health Committee*	-	*undated*
Peer Review Submission: *Vanessa Ryan, Academic Lead, Interprofessional Education, Flinders University*	-	21 September 2018

Period of Approval: 02 November 2018 to 02 November 2021

Sites covered by this approval:

- SA Department for Health and Wellbeing (SAMSS data)

Please note the following conditions of approval:

- The research must be conducted in accordance with the NHMRC *National Statement on Ethical Conduct in Human Research.*
- Confidentiality of the research subjects shall be maintained at all times as required by law.
- A progress report, at least annually, must be provided to the HREC.
- Researchers are required to immediately report to the HREC anything which might warrant review of ethical approval of the protocol, including:
    a. serious or unexpected adverse events;
    b. formal complaints from participants;
    c. protocol deviations or violations;
    d. proposed changes to the protocol or study documentation before they are implemented;
    e. proposed changes to the study investigators;
    f. new study documentation; and
    g. unforeseen events that might affect continued ethical acceptability of the project.
- Any proposed changes to the original proposal must be submitted to and approved by the HREC before they are implemented.
- If the project is discontinued before its completion, the HREC must be advised immediately and provided with reasons for discontinuing the project.
- A report and a copy of any published material should be forwarded to the HREC at the completion of the project.
- Study data is to be retained in accordance with the State Records Act 1997 *General Disposal Schedule 28* and archived in accordance with *SA Health Records Management policy directive*.

Site Specific Assessment (SSA)/Governance Approval:
This letter constitutes ethical approval only.
You are reminded that in accordance with the SA Health Research Governance Policy, **you must not commence this research project with a SA Health site until separate governance approval from that site has been obtained** via the completion of a Site Specific Assessment (SSA) form.
For assistance with the SSA process, please contact relevant site Research Governance Officer(s) pertaining to the study sites listed above.

University Personnel:
If university personnel are involved in this project, the relevant university should be notified before commencing their research to ensure compliance with university requirements including any insurance and indemnification requirements.

Should you have any queries about the HREC's consideration of your project please contact the Executive Officer of the HREC, on phone (08) 82267702 or email Health.HumanResearchEthicsCommittee@sa.gov.au

The HREC wishes you every success in your research.

Yours sincerely

Professor Annette Braunack-Mayer
Chair, Human Research Ethics Committee
SA Department for Health and Wellbeing
ABM:mk

cc David van der Hoek, Research Governance Officer, SA Department for Health and Wellbeing

19 August 2021

HUMAN ETHICS LOW RISK PANEL

APPROVAL NOTICE

Dear Mr Dennis Asante,

The below proposed project has been **approved** on the basis of the information contained in the application and its attachments.

Project No: 4647

Project Title: Understanding the health care needs of older adults with chronic health condition in rural South Australia

Primary Researcher: Mr Dennis Asante

Approval Date: 19/08/2021

Expiry Date: 31/08/2023

Please note: *Due to the current COVID-19 situation, researchers are strongly advised to develop a research design that aligns with the University's COVID-19 research protocol involving human studies. Where possible, avoid face-to-face testing and consider rescheduling face-to-face testing or undertaking alternative distance/online data or interview collection means. For further information, please go to https://staff.flinders.edu.au/coronavirus-information/research-updates.*

RESPONSIBILITIES OF RESEARCHERS AND SUPERVISORS

1. **Participant Documentation**

   Please note that it is the responsibility of researchers and supervisors, in the case of student projects, to ensure that:

   - all participant documents are checked for spelling, grammatical, numbering and formatting errors. The Committee does not accept any responsibility for the above mentioned errors.
   - the Flinders University logo is included on all participant documentation (e.g., letters of Introduction, information Sheets, consent forms, debriefing information and questionnaires – with the exception of purchased research tools) and the current Flinders University letterhead is included in the header of all letters of introduction. The Flinders University international logo/letterhead should be used and documentation should contain international dialing codes for all telephone and fax numbers listed for all research to be conducted overseas.

2. **Annual Progress / Final Reports**

   In order to comply with the monitoring requirements of the *National Statement on Ethical Conduct in Human Research 2007 (updated 2018)* an annual progress report must be submitted each year on the approval anniversary date for the duration of the ethics approval using the HREC Annual/Final Report Form available online via the ResearchNow Ethics & Biosafety system.

   Please note that no data collection can be undertaken after the ethics approval expiry date listed at the top of this notice. If data is collected after expiry, it will not be covered in terms of ethics. It is the responsibility of the researcher to ensure that annual progress reports are submitted on time; and that no data is collected after ethics has expired.

   If the project is completed *before* ethics approval has expired please ensure a final report is submitted immediately. If ethics approval for your project expires please either submit (1) a final report; or (2) an extension of time request (using the HREC Modification Form).

   For student projects, the Low Risk Panel recommends that current ethics approval is maintained until a student's thesis has been submitted, assessed and finalised. This is to protect the student in the event that reviewers recommend that additional data be collected from participants.

3. **Modifications to Project**

   Modifications to the project must not proceed until approval has been obtained from the Ethics Committee. Such proposed changes / modifications include:

- change of project title;
- change to research team (e.g., additions, removals, researchers and supervisors)
- changes to research objectives;
- changes to research protocol;
- changes to participant recruitment methods;
- changes / additions to source(s) of participants;
- changes of procedures used to seek informed consent;changes
- to reimbursements provided to participants;
- changes to information / documents to be given to potential participants;
- changes to research tools (e.g., survey, interview questions, focus group questions etc);
- extensions of time (i.e. to extend the period of ethics approval past current expiry date).

To notify the Committee of any proposed modifications to the project please submit a Modification Request Form available online via the ResearchNow Ethics & Biosafety system. Please note that extension of time requests should be submitted prior to the Ethics Approval Expiry Date listed on this notice.

4. Adverse Events and/or Complaints

Researchers should advise the Executive Officer of the Human Research Ethics Committee on at human.researchethics@flinders.edu.au immediately if:

- any complaints regarding the research are received;
- a serious or unexpected adverse event occurs that effects participants;
- an unforeseen event occurs that may affect the ethical acceptability of the project.

Yours sincerely,

Ms Camilla Dorian

on behalf of

Human Ethics Low Risk Panel
Research Development and Support
human.researchethics@flinders.edu.au

Flinders University
Sturt Road, Bedford Park, South Australia, 5042
GPO Box 2100, Adelaide, South Australia, 5001

http://www.flinders.edu.au/research/researcher-support/ebi/human-ethics/human-ethics_home.cfm

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PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Title: *Understanding the health care needs of older adults with chronic health condition in rural South Australia*

Chief Investigator
Mr Dennis Asante
College of Medicine and Public Health
Flinders University
Tel: 0406200657

Co-Investigator
Dr Vivian Isaac
College of Medicine and Public Health
Flinders University
Tel: 8586 1027

Co-Investigator
Dr Josephien Rio
SA Health, Government of South Australia
Tel: 8586 1002

Description of the study
This project will investigate the health care needs of older adults with chronic health conditions in rural South Australia and barriers to accessing the relevant health services. This project is supported by Flinders University, College of Medicine and Public Health.

Purpose of the study
This study aims to:

1. Explore the health care needs (physical, emotional, and psychosocial) of older adults with chronic conditions in rural SA
2. Understand the facilitators of and barriers to accessing relevant services by older adults with chronic health conditions in rural SA
3. Understand the challenges of health service providers in addressing the needs of older adults with chronic health condition(s) in rural SA

The outcome of this project will contribute knowledge to effective strategies of achieving the "Aging in Place" policy, which seeks to bring decent quality of life to individuals and families and saves governments money in providing residential age care facilities.

Benefits of the study
The sharing of your experiences will assist in the development of strategic programs and policy reform to improve rural health delivery and health outcomes for older adults.

Participant involvement and potential risks
If you agree to participate in the research study, you will be asked to:

- attend a focus group interview with a researcher that will be audio recorded
- respond to questions regarding your views about health services provision and access in rural South Australia.
- As a health professional, what do you consider as the important health needs of person with chronic conditions?
- What are some of the unique barriers for persons with chronic illness to access health services in rural and remote areas?
- Share your experience on key challenges in providing services for older persons with chronic conditions
- How do you navigate these challenges in your line of duty to provide services to your patients?
- Share your views on how the challenges to health services provision in rural areas could be completely addressed.

The discussion will take about 45-60 minutes and participation is entirely voluntary.

If risks are anticipated, they should be listed in this section. Participants must be aware of all risks and burdens, no matter how minor.

The researchers do not expect the questions to cause any harm or discomfort to you. However, if you experience feelings of distress as a result of participation in this study, please let the research team know immediately. You can also contact the following services for support:

- Lifeline – 13 11 14, www.lifeline.org.au
- Beyond Blue – 1300 22 4636, www.beyondblue.org.au
- Regional mental health service- 131465
- Community mental health service- 0885802525

Withdrawal Rights
You may, without any penalty, decline to take part in this research study. If you decide to take part and later change your mind, you may, without any penalty, withdraw at any time without providing an explanation. To withdraw, please contact the Chief Investigator or you may just refuse to answer any questions / close the internet browser and leave the online survey / leave Focus Group discussions / not participate in exercises at any time. Any data collected up to the point of your withdrawal will be securely destroyed.

Data recorded during focus group discussions may not be able to be destroyed. However, the data will not be used in this research study without your explicit consent.

Confidentiality and Privacy
Only researchers listed on this form have access to the individual information provided by you. Privacy and confidentiality will be assured at all times. The research outcomes may be presented at conferences, written up for publication or used for other research purposes as described in this information form. However, the privacy and confidentiality of individuals will be protected at all times. You will not be

named, and your individual information will not be identifiable in any research products without your explicit consent.

No data, including identifiable, non-identifiable and de-identified datasets, will be shared or used in future research projects without your explicit consent.

Data Storage
The information collected may be stored securely on a password protected computer and/or Flinders University server throughout the study. Any identifiable data will be de-identified for data storage purposes unless indicated otherwise. All data will be securely transferred to and stored at Flinders University for five years after publication of the results. Following the required data storage period, all data will be securely destroyed according to university protocols.

Recognition of Contribution / Time / Travel costs
If you would like to participate, in recognition of your contribution and participation time, you will be provided with a $20.00 shopping/snack voucher. This voucher will be provided to you on completion of the interview.

How will I receive feedback?
On project completion, a short summary of the outcomes will be provided to all participants via email or published on Flinders University's website.

Ethics Committee Approval
The project has been approved by Flinders University's Human Research Ethics Committee (08 8201 2543).

Queries and Concerns
Queries or concerns regarding the research can be directed to the research team. If you have any complaints or reservations about the ethical conduct of this study, you may contact the Flinders University's Research Ethics & Compliance Office team via telephone 08 8201 2543 or email human.researchethics@flinders.edu.au.

Thank you for taking the time to read this information sheet which is yours to keep. If you accept our invitation to be involved, please sign the enclosed Consent Form.

CONSENT FORM

Consent Statement

☐ I have read and understood the information about the research, and I understand I am being asked to provide informed consent to participate in this research study. I understand that I can contact the research team if I have further questions about this research study.

☐ I am not aware of any condition that would prevent my participation, and I agree to participate in this project.

☐ I understand that I am free to withdraw at any time during the study.

☐ I understand that I can contact Flinders University's Research Ethics & Compliance Office if I have any complaints or reservations about the ethical conduct of this study.

☐ I understand that my involvement is confidential, and that the information collected may be published. I understand that I will not be identified in any research products.

☐ I understand that the information collected may be published and that my identity may be revealed.

☐ I understand that I will be unable to withdraw my data and information from this project. I also understand that this data **will be used / will not be used** for this research study.

I further consent to:

☐ participating in a Focus Group discussion
☐ having my information audio recorded
☐ sharing my de-identified data with other researchers
☐ sharing my identifiable data with other researchers
☐ my data and information being used in this project and other related projects for an extended period of time (no more than 5years after publication of the data)
☐ being contacted about other research projects

Signed:

Name:

Date:

Flinders
UNIVERSITY
inspiring achievement

Is chronic health condition impacting youreveryday life?

Are you passionate about improving rural health services?

Flinders University is supporting a research project on health care needs of olderadults with chronic conditions in rural South Australia.

If you are a health service user and/or provider and would like to be interviewed about your experience in rural health system and contribute to understanding the needs older adults and developing more responsive health services, we would like tohear from you.

Are you eligible?

Health service users

- 60years or older
- Been told by a doctor of having Physical and/or

Health care providers

- Health care professionals (GP, Nursing practitioner,

	mental condition(s) (e.g., cancer, diabetes, heart disease, arthritis, depression, anxiety • Have use health services at least once in the past 12 months • Have lived in the rural community for a year or more	specialized mental health service provider) • 12 months or more experience of practice in rural area • No age limit for health care professionals • Provide services to older adults

- Participants will receive a $20.00 shopping voucher compensation for snacks and refreshment.

Please contact *dennis.asante@flinders.edu.au* or call 0406200657 for more information about participation in this study.