Effect of Psychological Factors on GP Follow-Up and Short-Term Hospital Readmission Among Older Inpatients' with Comorbid Cardiovascular Disease and Diabetes

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Abstract

Life expectancy at birth is increasing in Australia, alongside the prevalence of chronic conditions and comorbidity. This places a heavy burden on patients, carers, and our healthcare system. Minimal research has assessed psychological risk factors for non-adherence and hospital readmissions in patients who have comorbid cardiovascular disease and diabetes, yet these commonly co-occur, particularly in older adults, and are associated with increased hospitalizations. This longitudinal cohort study aims to explore psychological risk factors for non-adherence (failing to attend a general practitioner follow-up appointment after hospital discharge) and short-term hospital readmission in older adult inpatients (N = 36, M = 67.78 years) with cardiovascular disease and diabetes, recruited from a public hospital in Australia. Results indicated that GP follow-up and readmission were not related, and no gender differences were found. CHLOC (OR = 0.82) and PHLOC (OR = 0.82) predicted non-adherence. Depression (r = -.23) and stress (r = -.10) increased likelihood of readmission, however logistic regression analyses found none of these significantly predicted readmissions. These findings help to inform the risk factors of non-adherence and short-term readmissions in older adults with comorbid cardiovascular disease and diabetes, which may help reduce the impact on our healthcare system.

Declaration

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

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Date: October 2019

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CHAPTER 1

Introduction

1.1 Overview

Life expectancy at birth is steadily increasing in Australia resulting in a larger proportion of the population falling into older age groups (Australian Department of Health and Ageing, 2010). In 2017, 15% of the population were aged over 65 years, and this is projected to reach 20% by 2037 (Australian Bureau of Statistics; ABS, 2017; Australian Institute of Health and Welfare; AIHW, 2018a). An ageing population has implications for Australians, including a rising prevalence of chronic diseases, comorbidity (co-occurrence of one or more health condition/s; Kessler, 1995), and multimorbidity (co-occurrence of two or more health conditions; World Health Organization, 2016; ABS, 2018). In 2017 - 2018, approximately 80% of people aged 65 years and over had at least one chronic condition, 11.5% of the population had two, and almost 8.7% had three or more chronic conditions (ABS, 2018).

Chronic conditions can result in significant biological, psychological, social, and economic impacts at the individual level, with implications for individuals, carers, family, and friends. These include, poor mental health (Kessler et al., 2003), lack of social support, poor quality of life, increased hospitalizations, disability, high cost of care, and premature death (ABS, 2018; AIHW, 2019a, 2019b, 2019c 2019d). At the broader societal level, chronic conditions place a heavy burden on our healthcare system; for over 20 years, non-communicable (chronic) diseases have led to the highest amount of disease burden (measured by disability-adjusted life years: years of life lost due to poor health, disability or premature death) when compared with maternal/neonatal, communicable, and injury-related illnesses (AIHW, 2018a). Research has demonstrated that patients with comorbid or multimorbid chronic conditions are at

greater risk of experiencing hospital readmission and other adverse outcomes (Zekry et al., 2012).

1.2 Cardiovascular Disease and Diabetes

The Australian Institute of Health and Welfare (AIHW, 2018a) named eight common chronic conditions that led to high number of hospitalizations and deaths between 2015 and 2016. Two of these conditions, cardiovascular disease (CVD) and diabetes, often co-occur, contribute to a significant proportion of hospitalizations and deaths, and are the leading cause of poor health in Australia and globally (Arastoo et al, 2012). Individual's with diabetes have twice the risk of developing CVD; are five times more likely to have a stroke, and 10 times more likely to have a heart attack, compared to those without diabetes (ABS, 2018; Australian Department of Health, 2016).

CVD refers to a set of chronic disorders that affect the heart and blood vessels, involving narrowing and/or blockage of the blood vessels, defects of the heart's muscle, rhythm or valves, and/or a buildup of fatty plaques in the arteries impeding blood flow to the organs and tissues in the body (AIHW, 2019d; Australian Department of Health, 2016). An estimated 4.8% of the Australian adult population reported having at least one type of CVD between 2017 - 2018 (ABS, 2018). CVD is more common in males than females (5.4% and 4.2% respectively) and the elderly (≥ 65 years), with just under 5% of the CVD population aged below 55 years, compared with 26% aged 75 and over (ABS, 2018). It is the leading cause of disease burden (accounted for 14% of the total disease burden in 2014) and death in Australia (underlying cause of 27% of all deaths in 2014; ABS 2018; AIHW, 2019a, 2019d). Just over 11% of all hospitalizations in 2016 - 2017 were attributed to CVD conditions and the total cost to the healthcare system was $10.4 billion (8.9% of the total disease expenditure; AIHW, 2019c).

Diabetes mellitus is a chronic condition defined by high blood glucose levels, whereby the pancreas does not efficiently produce and/or use insulin (hormone responsible for regulating blood sugar levels) effectively (ABS, 2018; AIHW, 2019b). Between 2017 - 2018, approximately 1 in 20 Australians (4.9% of the population) were living with diabetes. There are two common forms of diabetes: Type 1 (T1DM) and Type 2 (T2DM); the latter is the most common, with approximately 0.6% and 4.1% of the population diagnosed, respectively. Diabetes disproportionately affects males (5.5% males, 4.3% females) and the elderly (15.4% of adults aged 65 – 74 years and 18.7% aged 75 and over; AIHW, 2019b). Diabetes was the underlying cause of 3% of all deaths in 2017, ranking in as the seventh leading cause of death (ABS, 2018). Between 2015 – 2016, diabetes contributed to 9.9% of all hospitalizations (AIHW, 2018a). T1DM and T2DM accounted for 2.2% and 0.3% (respectively) of the total disease burden in 2015, with T1DM being the 12th largest contributor to Australia's disease burden, costing the health system an estimated $2.7 billion (2.3%) of total disease expenditure (AIHW, 2019b, 2019c).

CVD and diabetes commonly co-occur and have a similar pathophysiological basis (Dokken, 2008). Major risk factors for both conditions involve a genetic component as well many modifiable lifestyle factors including overweight/obesity, unhealthy diet, physical inactivity, and smoking (AIHW, 2019b; Mayo Clinic, 2018). Diabetes (particularly T2DM) is a major risk factor for developing CVD because the high blood glucose levels caused by the diabetes can eventually lead to damaged blood vessels and a buildup of fatty deposits in the artery walls, restricting blood flow and increasing the risk of cardiovascular problems (Dokken, 2008). Individuals with diabetes, particularly T2DM, often have co-existing conditions which increase the likelihood of developing CVD conditions, such as hypertension (high blood

pressure), overweight/obesity, low/no physical activity, and smoking. Both of these conditions are more prevalent in older adults and those with CVD and/or diabetes are exposed to a higher risk of poor health outcomes, particularly recurrent hospitalizations, poor quality of life, and premature mortality, placing excessive strain on the healthcare system (ABS, 2018; AIHW, 2018a; AIHW, 2019a, 2019d; Comino et al, 2015; Nobili et al., 2011).

Despite the common co-existence of CVD and diabetes among older adults, these conditions are typically treated separately in our secondary and tertiary healthcare systems and although much is known about each condition in isolation, minimal research has explored the risk factors for negative outcomes associated with comorbid CVD and diabetes, such as non-adherence to medical advice (provided by a treating clinician upon discharge from hospital) and short-term hospital readmission (following initial discharge). Given the abovementioned adverse outcomes associated with these conditions, this is important to investigate.

1.3 Hospital Readmission and General Practitioner Follow-Up in CVD and Diabetes

Individually, CVD and diabetes have been shown to be the two leading comorbidities associated with increased likelihood of short-term hospital readmission (herein referred to as 'readmission/s'; Donzé, Lipsitz, Bates, & Schnipper, 2013; Mudge et al., 2011). Previous research consisting of 848 older inpatients in South Australia found that 24.6% of patients discharged with a diagnosis of diabetes along with other comorbidities (including CVD) were readmitted within 30 days of being discharged, and of those that were readmitted, most (77.5%) of these occurred within 14 days (Caughey et al., 2017). Patients with diabetes and co-existing heart conditions were at greater risk for readmission (adjusted *OR* = 1.49, 95% CI [1.03, 2.17], *p* = .036).

Reducing readmissions in patients with CVD conditions is a high priority, with evidence suggesting that approximately 25 - 45% of readmissions are preventable, given appropriate identification, diagnosis, and management of risk factors (Reed, Bokovoy, & Doram, 2014). Many studies have indicated various risk factors for readmissions in patients with CVD or diabetes conditions separately, demonstrating that demographics, socioeconomic status, and comorbidities play a role, however they failed to explore risk factors for readmissions in patients experiencing these conditions concurrently (Franchi et al., 2013; Rubin, 2015; Silverstein, Qin, Mercer, Fong, & Haydar, 2008).

As part of the hospital discharge process, patients are advised by the treating doctor to follow-up with their general practitioner (GP) within 14 days. Failing to do is considered non-adherence. Recent research has revealed that failing to follow-up with a GP after a hospital admission may result in higher chances of readmission. Caughey et al. (2017) found that 41% of patients who were readmitted within 30 days did not follow-up with their GP between discharge and readmission A study by Riverin, Strumpf, Naimi, and Li (2018) found that patients who visited a GP within 10 days of being discharged were less likely to be readmitted than those who did not visit a GP (67.8 fewer readmissions per 1000 discharges), and this was also found (although to a lesser extent) when the follow-up was within 21 days of discharge (110.0 fewer readmissions per 1000 discharges). This effect is stronger in patients with higher levels of morbidity (19.1%-point reduction; Jackson, Shahsahebi, Wedlake, & DuBard, 2015). Numerous studies have supported the significance of timely GP follow-up in reducing readmissions for patients with CVD and/or diabetes (AIHW, 2018b; Leschke et al., 2012; Muus et al., 2010; Sharma, Kuo, Freeman, Zhang, & Goodwin, 2010; Shen et al., 2017). However, other studies have refuted these findings, concluding that GP follow-up visits do not significantly reduce

readmission rates. (DeLia, Tong, Gaboda, & Casalino, 2014; Kashiwagi, Burton, Kirkland, Cha, & Varkey, 2012).

These conflicting findings may be due to a lack of understanding in the literature and in clinical practice regarding the potential influence of psychopathology on GP follow-up and readmission in older patients with comorbid CVD and diabetes. It is also unknown whether patients are intending to see their GP (as advised upon discharge), but then fail to do so, or, they have no intention to adhere to this advice in the first place. Evidence has suggested that psychological factors, such as emotional state and health control beliefs, may play a role in acting as facilitators or barriers of adherence to medical advice, GP follow-up after discharge, and readmission (Daratha et al., 2012; Edmondson, Green, Ye, Halazun, & Davidson, 2014; Mudge et al., 2011). However, further research is needed.

1.4 Emotional State, GP Follow-up (Adherence to Medical Advice) After Hospital Admission, and Short-Term Readmission

Extensive research has demonstrated the predictive ability of emotional state for various negative health outcomes, including increased risk of recurrent hospitalizations and non-adherence to treatment regimens and outpatient follow-up care after admission (Daratha et al., 2012; Goldstein, Gathright, & Garcia, 2017; Edmondson et al., 2014; Holvast et al., 2019; Mendes, Martins, & Fernandes, 2017; Mudge et al., 2011).

Alavi, Baharlooei, and AdelMehraban (2017), found that 44% out of 150 elderly diabetic patients (M = 67.99 years, SD = 6.93) who experienced readmission at least once after being discharged from hospital also had significantly higher mean scores for depression, anxiety, and stress, compared to those who were not readmitted. In their study, emotional state and perceived social support together significantly predicted 72.7% of readmissions. This may be due to the

links between emotional state, CVD, and diabetes, and the increased likelihood of engaging in unhealthy lifestyle behaviours, such as consuming an unhealthy diet, lack of exercise, and not adhering to medical advice Clinical Epidemiology Health Service Evaluation Unit, 2009).

Similar conclusions were drawn in elderly patients with CVD conditions, whereby severe depression and severe anxiety were both significantly associated with a 1.06 -times greater likelihood of 30-day readmission respectively, whilst controlling for cognitive impairment (Huynh et al., 2015). However, another study found that mood disorders were not predictive of readmission among elderly patients with CVD conditions, when controlling for previous hospital admissions, number of comorbidities and disease severity (Franchi et al., 2013). This discrepancy may be due to the cultural differences in ways of defining mood disorders and variations in the epidemiology of these across countries (as the former study was undertaken in Australia and the latter in Italy), along with the use of different scales to measure depression, anxiety, and stress.

The current findings suggest that emotional state may help clinicians with predicting adherence to advice (GP follow-up) and readmission.

1.5 Health Locus of Control, GP Follow-Up (Adherence to Medical Advice), and Short-Term Readmission

Understanding individual differences in the way individuals attribute situations, outcomes, and events is the core of Rotter's (1954) concept; Locus of Control (LOC), also sometimes referred to as 'control beliefs'. LOC refers to the tendency to perceive positive and negative outcomes as being within one's control, or due to external forces outside of one's control (Rotter, 1966). Levels of perceived control fall along a continuum ranging from internal LOC (ILOC) to external LOC (ELOC). Individuals with higher levels of ILOC tend to attribute

positive and negative health outcomes as being the result of one's own actions or lack thereof, whilst higher levels of ELOC indicate beliefs that luck/chance, or powerful others control one's health outcomes (Rotter, 1966). Previous studies have demonstrated a significant relationship between LOC and the utilization of healthcare services; they found a positive relationship between ILOC and engagement with healthy behaviours (e.g. exercise, adherence to medical treatment regimens), and a negative relationship with financial burden on the patient and healthcare system (Cross, March, Lapsley, Byrne, & Brooks, 2005; Gabay, 2015, 2016; Omeje & Nebo, 2011). The application of LOC in the medical field rose to population predominantly due to the work of Wallston, Wallston, and DeVellis (1978), who developed the Multidimensional Health Locus of Control Scale (HLOC) to measure LOC in a situation-specific health-related domain. According to this scale, health-related outcomes are attributed to one of three factors: internal (IHLOC; taking responsibility for their own health, striving for a healthy lifestyle), chance (CHLOC; fate, luck, destiny), and/or powerful others (PHLOC; clinicians, family, friends). For the latter two, individuals typically perceive themselves as lacking control over their health (Wallston et al., 1998).

Many studies have demonstrated that HLOC can predict patients that are likely to engage in health-seeking behaviour and adhere to medication and treatment regimens, and vice versa (Lilla, Kent, & Peter, 2017; Omeje & Nebo, 2011; Taher et al., 2015). It has been suggested that patients who take responsibility for their health, hence perceive themselves as being in control over their own health, tend to score higher on IHLOC, and are also more likely to seek care, adhere to treatment regimens, and less likely to end up in emergency departments, than those with a CHLOC or PHLOC, who perceive their health outcomes as being beyond their control (Bazargan, Bazargan, & Baker, 1998; Chambers et al., 2013; Lilla et al., 2017; Omeje & Nebo,

2011). Similarly, West, Borg Theuma, and Cordina (2018) also found that lower levels of CHLOC was significantly associated with medication adherence, and PHLOC was associated with non-adherence. However, the relationship between PHLOC, medical adherence, and hospital admissions has shown to be ambiguous, as both negative and positive associations have been documented (Bazargan et al., 1998; Lilla et al., 2017; Omeje & Nebo, 2011; Taher et al., 2015). Taher et al.'s (2015) study in patients with hypertension (high blood pressure) showed that those with IHLOC and PHLOC better adhered to treatment regimens and had controlled blood pressure, and those with CHLOC were less likely to adhere and more likely to have hypertension. They also found that patients with PHLOC and IHLOC had less hospitalizations (Taher et al., 2015).

There is also evidence to suggest that HLOC can help to predict patients that at greater risk for readmission. In a study by Mautner et al. (2017), their sample of 863 adult patients aged 19 – 64 (M = 48.78, SD = 17.19) found evidence that HLOC was predictive of hospital admissions. They found that individuals with higher levels of externality (CHLOC, PHLOC) was associated with increased hospital admissions and those with higher levels of internality (IHLOC) were associated with decreased hospital admissions. These findings have been replicated across multiple studies (Bazargan et al., 1998; Chambers et al., 2013; Gabay, 2016). Bazargan et al. (1998) found that elderly individuals with PHLOC were 2.5 times more likely to be admitted to hospital, and those with CHLOC were 1.5 times more likely ($p < .001$, and .05, respectively). In comparison, they found that IHLOC predicted a decreased likelihood of admission (OR = 0.42, $p < .001$). In addition, the negative effect of IHLOC on readmissions has remained constant when controlling for demographic and other general health variables (e.g. length of illness, regular medication consumption, length of relationship with GP; Gabay, 2016).

However, another study found that PHLOC was negatively associated with readmission (Taher et al., 2015); thus, this needs further investigation, particularly in a sample with comorbid CVD and diabetes.

These findings indicate that understanding patients HLOC may be beneficial for predicting patients that are less likely to adhere to medical advice (visit their GP within 14 days of discharge); patients with higher PHLOC and CHLOC may be less likely to see their GP than those with IHLOC. Additionally, HLOC may play an important role in predicting patients that are more likely to be readmitted to hospital (within 30 days of discharge from initial admission); patients with higher levels of PHLOC and CHLOC may be more likely to be readmitted and those with IHLOC may be less likely to be readmitted. HLOC appears to be modifiable, with increases in patients scores for IHLOC following a major healthcare intervention, after receiving major surgery for CVD (Rideout, Tolmie, & Lindsay, 2016). Patients at risk of non-adherence and readmission may benefit from empowerment and psychoeducation interventions that focus on modifying patients HLOC by increasing their levels of internal beliefs (IHLOC) and thereby perceptions of control over their heath conditions. Furthermore, increasing patients' level of IHLOC and decreasing PHLOC and CHLOC has the potential to improve adherence and subsequently may reduce readmissions in patients with comorbid CVD and diabetes (Hajek & König, 2017).

1.6 Present Study

The present study aims to investigate whether psychological factors (health control beliefs: HLOC; emotional state: DASS21) can predict non-adherence to medical advice (GP follow-up within 14 days of discharge from hospital) and readmission (within 30 days of initial discharge), among older Australian inpatients with comorbid CVD and diabetes. Whilst the

current literature has identified the role of emotional state and health control beliefs on adverse health outcomes, including non-adherence to treatment regimens and readmissions (Alavi et al., 2017), there are discrepancies in the direction of the relationships, and no studies have looked at these factors in populations with comorbid CVD and Diabetes. This study will explore the potentiality for emotional state and health control beliefs to predict the likelihood of 14-day GP follow-up (after discharge from hospital) and 30-day readmission.

1.6.1 Hypotheses.

Based upon the aforementioned findings, we hypothesize that emotional state and HLOC will predict patterns of healthcare utilization (GP follow-up within 14 days after discharge from initial hospital admission) and subsequent readmission within 30 days, following initial discharge), specifically as follows:

Hypothesis one: gender may or may not be associated with GP follow-up and readmission; the direction of the association is unknown.

Hypothesis two: GP follow-up will be associated with a lower likelihood of readmission.

Hypothesis three: participants reporting stronger intentions to follow-up with their GP will have higher rates of actual GP follow-up and lower readmission rates.

Hypothesis four: higher scores on all three subscales of DASS21 will be negatively related to GP follow-up and positively related to readmission.

Hypothesis five: higher scores for IHLOC will be positively associated with GP follow-up, and higher scores for PHLOC and CHLOC will be negatively associated with GP follow-up. Higher scores for IHLOC will be negatively associated with readmission, whilst PHLOC and CHLOC will be positively associated with readmission.

Hypothesis six: scores on the subscales for HLOC and DASS21 will predict GP follow-up, specifically: higher scores on IHLOC will predict an increased likelihood of GP follow-up, whilst higher scores for PHLOC, CHLOC, Depression, Anxiety, and Stress will predict a decreased likelihood of GP follow-up.

Hypothesis seven: scores on the subscales for HLOC and DASS21 will predict readmission, specifically: higher scores on IHLOC will predict a decreased likelihood of readmission, whilst higher scores on PHLOC, CHLOC, Depression, Anxiety, and Stress will predict an increased likelihood of readmission.

CHAPTER 2

Method

2.1 Participants

Older adult inpatients (77.78% male) aged 50 years and over (*M* = 67.78, *SD* = 9.29, *range* = 51 – 87) with a clinical diagnosis of comorbid CVD and diabetes, were recruited from a major public teaching hospital in South Australia, between April 2019 and June 2019. Clinicians, pharmacists, and nurses involved in the patient's care assisted the researcher to identify eligible patients. Inclusion criteria consisted of: inpatients aged ≥ 50 years, proficient in English, and able to provide written informed consent. All reasons for admission were included, even if it was not directly related to CVD and diabetes. Exclusion criteria consisted of patients: being treated with palliative intent, residing in (or likely to be discharged to) high-care residential facilities, experiencing delirium or cognitive impairment, or any other condition that may interfere with their ability to give informed consent/comply with study procedures, and who the clinical team deemed inappropriate to include (i.e. not feeling well, aggressive tendencies). Participation was voluntary and incentivization was not provided.

Thirty-seven participants were enrolled at baseline, one withdrew from the study, and some did not complete all baseline measures, however all participants were followed-up at T1 and T2 (Figure 1).

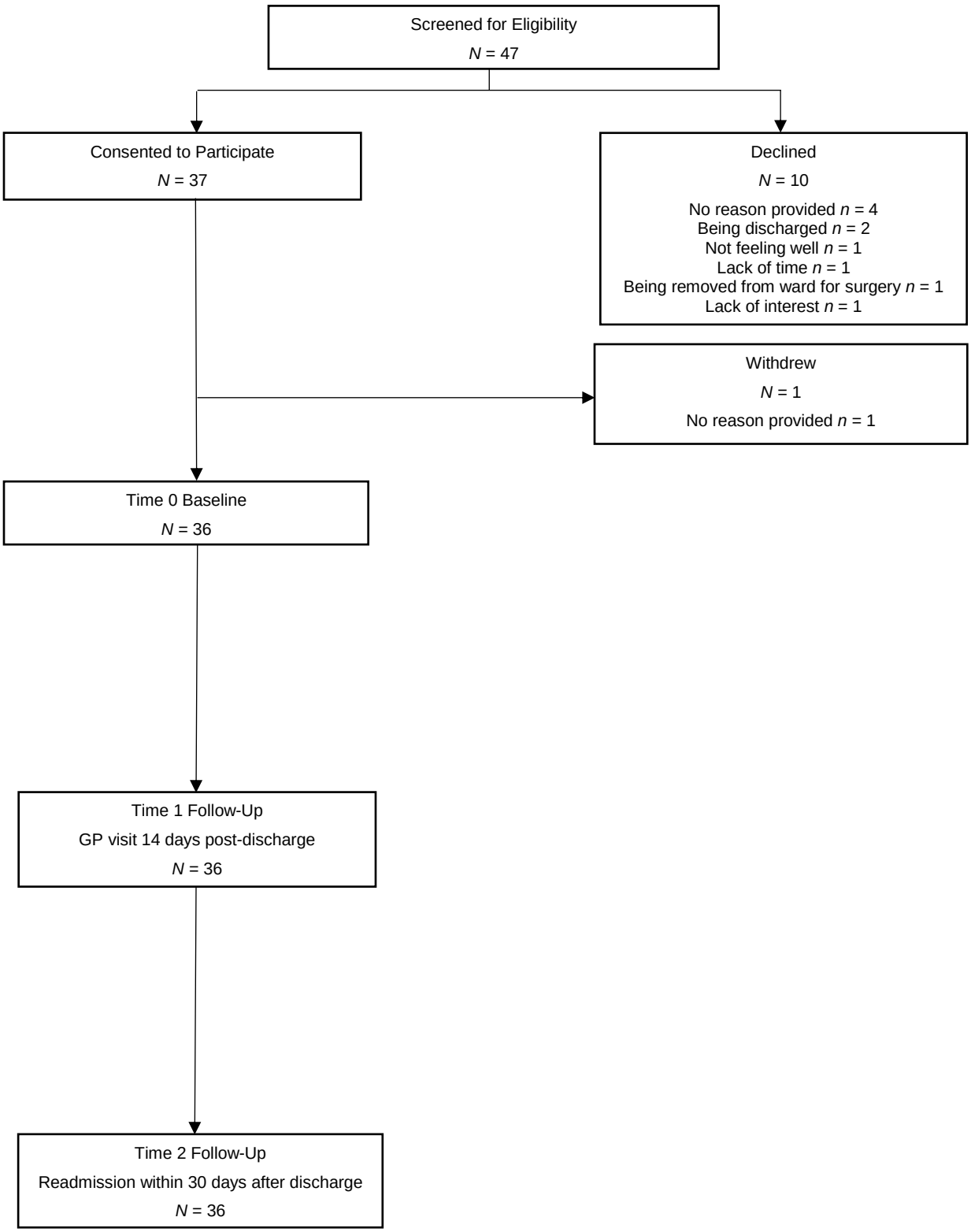

Figure 1. Participant Flowchart

2.2 Procedures

After providing written informed consent, participants completed a battery of baseline questionnaires (T0). This included measures health control beliefs, emotional state, intention to follow-up with GP post-discharge, physical mobility/performance on activities of daily living, cognitive functioning, living situation, self-rated health, social support, smoking status, weight, height, and basic demographics. Completion time was approximately 30 minutes.

The first follow-up (T1) occurred 14 days post-discharge. The patient's GP clinic was contacted by the researcher, to assess whether they had visited their GP within this period. This time period was chosen due to studies demonstrating greater reductions in readmission for patients who had visited their GP within 14 days of discharge (Riverin et al., 2018).

The next follow-up (T2) occurred 30 days post-discharge. This assessed whether the patient had been readmitted to hospital within this period. This information was collected from hospital administrative data and patient's electronic health records, accessed by the principle investigator. This time period was chosen because the likelihood of readmission is higher within the first 30 days after discharge and preventable readmissions are higher within shorter periods of time after discharge (Van Walraven et al., 2011).

Ethical approval was obtained through the Central Adelaide Local Health Network (CALHN) Human Research Ethics Committee (HREC; # R20190301), in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for research involving human subjects.

2.3 Measures

The Baseline questionnaire consisted of general health measures and demographics, including: GP details, physical mobility/functional independence (Barthel's Index for Activities

of Daily Living: BIADL; Mahoney & Barthel, 1965), cognitive functioning (Abbreviated Mental Test Score; Hodkinson, 1972), number of hospitalizations in previous 12 months, weight, height, smoking status (*Ex, Current, Never*), living situation (*Alone, With Someone, Residential Care*), social support (*Always*, *Sometimes*, *Never*), and self-rated health (*Good*, *Fair*, *Poor*, adapted from the Reported Edmonton Frail Scale; Hilmer et al., 2009; Rolfson, Majumdar, Tsuyuki, Tahir, & Rockwood, 2006). Intention to follow-up with GP within 14 days post-discharge (ranging from 1 = *Very Unlikely* to 5 = *Very Likely*) was also collected at baseline.

The 21-item Depression, Anxiety, and Stress Scale (DASS21; Lovibond & Lovibond, 1995), was used to measure the severity of negative affective states of depression, anxiety, and stress, over the past week. The scale consists of 21 items and separate scores are obtained for the three subscales (seven items each). Participants are required to rate the degree to which each item applied to them over the past week, e.g. "I found it difficult to relax", using a 4-point severity scale, ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The Depression scale measures hopelessness, dysphoria, self-depreciation, devaluation of life, lack of interest, inertia, and anhedonia; the Anxiety scale measures autonomic arousal, anxiousness, skeletal muscle outcomes, and situational anxiety; and the Stress scale measures inability to relax, agitation, nervousness, impatience, and irritability. Results are obtained by summing up the scores for each subscale separately and then multiplying the summed score by two (this allows the scores to be compared to scores from the full version DASS). Higher scores indicate more severe symptomology (min = 0, max = 42). Severity cut-off scores: Depression: normal (0 – 6), mild (7 – 12), moderate (13 – 19), severe (20 – 42); Anxiety: normal (0 – 4), mild (5 – 9), moderate (10 – 14), severe (15 – 42); Stress: normal (0 – 10), mild (11 – 17), moderate (18 – 25), severe (26 – 42; Lovibond & Lovibond, 1995). Henry and Crawford (2005) found

strong internal reliability estimates for all items within the three subscales (Cronbach's α = .88, .82, and .90, respectively). This scale also has good convergent validity with other measures of negative affect (Elhai, Levine, Dvorak, & Hall, 2016).

The Multidimensional Health Locus of Control scale (MHLC), Form A, was used to measure beliefs about determinants of health-related outcomes (HLOC; Wallston et al., 1978). The 18-item scale consists of three subscales (six items each) and includes belief statements relating to the maintenance of health, e.g. "When I get sick, I am to blame". The participant is required to rate the extent to which they agree/disagree with each statement. Scores are obtained on a six-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). A separate score is obtained for each subscale to determine the extent to which the participant has an "Internal", "Chance", and "Powerful Others" HLOC. Scores on the subscales range from 6 - 36, with higher scores for "internal" indicating beliefs that staying healthy and becoming sick occurs as a result of one's own behaviour. Higher scores for "Chance" indicate beliefs that staying healthy and becoming sick occurs as a result of luck, fate, and/or chance; factors outside of one's own behaviour. Higher scores for "Powerful Others" indicate beliefs that staying healthy and becoming sick occurs as a result of the care provided by others, e.g. medical professionals, family, and/or friends; factors outside of one's own behaviour. Good scale reliability has been demonstrated (Cronbach's α = .68, .69, and .78, respectively; Bazargan et al., 1998).

As stated in the procedures section, the outcome variables were captured by the researcher contacting patient's GP clinics (for GP follow-up) and accessing readmission records (for hospital readmissions). Both outcome variables were measured as binary (Yes/No) responses.

2.4 Statistical Analysis Plan

An a-priori power analysis indicated that 39 participants would be necessary for repeated-measures analyses with two follow-ups, in order to detect a medium effect size (r = .30) with 80% power and an alpha level of .05 (Pituch & Stevens, 2016).

Data screening and analyses were undertaken using SPSS Version 25. Pearson's bivariate correlations and point biserial correlations were conducted to explore relationships between all predictor and outcome variables. Chi-square two-way tests of association were performed to determine whether there were significant gender differences in GP follow-up and readmissions, Fisher's exact test was reported for both, due to the small sample size (minimum expected frequency < 5 for 25% of cells). Finally, two separate standard multivariate logistic regression models were run to determine whether the psychological variables predict the likelihood of (1) adherence to GP-follow-up and (2) readmission. To save power, the models included variables which had at least small associations (≥ .10) with the outcome variables (GP follow-up and readmission). Due to the lack of power and small sample, 'exclude cases pairwise' analyses (cases only excluded from the analysis if they were missing the data required for that specific analysis) were performed to deal with participants with missing data. The number of participants in each analysis is specified.

CHAPTER 3

Results

3.1 Data Screening and Preliminary Analyses

Prior to analysis, data were screened for outliers, invalid and missing values. To test for normality of the data and ensure the assumptions of parametric statistics were met, the shape of the distributions for all continuous variables were inspected using histograms and QQ plots (Tabachnick & Fidell, 2013). All distributions appeared normal and linear.

Sample characteristics and descriptive statistics are presented in Table 1. In total, 36 participants were included; majority were male. Overall, participants were elderly, Australian-born, current smokers, living with three or more comorbidities, admitted to hospital more than twice in the previous year or not at all, in hospital for over two weeks, living with someone, socially supported, and perceived themselves to be in good health. BMI was high, suggesting that participants were generally overweight/obese (Better Health, 2018). Patients reported mild levels of depression, mild – moderate anxiety, normal stress levels (Lovibond & Lovibond's, 1995), high IHLOC and PHLOC, and low CHLOC. Patients usually had good physical mobility and cognitive functioning. At baseline, most patients indicated strong intentions to follow-up with their GP within 14 days after discharge from hospital. At follow-up, most patients did follow-up with their GP within 14 days after being discharged and majority were not readmitted to hospital within 30 days.

Pearson's correlations and point biserial correlations were conducted to investigate relationships between variables and to determine variables appropriate for inclusion in the logistic regression analyses (See Table 2). To save power, only variables that had at least a small

correlation (≥ .10) with the dependent variables (GP follow-up, readmission) were included in the model.

Table 1

Sample Characteristics and Descriptive Statistics

Variable	*N/n*	Min	Max	*M*	*SD*
Age	36	51	87	67.78	9.29
BMI	29	20.50	47.60	31.38	6.05
Depression	27	0	15	8.52	8.53
Anxiety	27	0	19	9.70	8.94
Stress	27	0	16	9.19	8.93
IHLOC	28	8	33	23.39	6.72
CHLOC	28	6	33	16.61	7.58
PHLOC	28	6	36	22.79	6.95
GP Intention	35	1	5	4.03	1.29
BIADL	34	35	100	88.24	16.37
Cognitive Functioning	27	6	10	8.33	1.14
Initial LOS (days)	36	2	97	16.50	19.46

	n (%)
Hospital Admissions Within Previous 12 Months	
None	12 (33.33%)
≥ 2	12 (33.33%)
1-2	11 (30.56%)
Unknown	1 (2.78%)
Country of Birth	
Australia	23 (63.89%)
Other	10 (27.78%)
Unknown	3 (8.33%)
Gender	
Male	28 (77.78%)
Female	8 (22.22%)
Self-Rated Health	
Good	17 (47.22%)
Fair	11 (30.56%)
Poor	7 (19.44%)
Unknown	1 (2.78%)
Social Support	
Always	25 (69.44%)
Sometimes	9 (25.00%)
Never	1 (2.78%)
Unknown	1 (2.78%)
Smoker	
Current	17 (47.22%)
Unknown	9 (25.00%)
Never	7 (19.44%)
Ex	3 (8.33%)
Living Situation	
With someone	22 (61.11%)
Alone	13 (36.11%)
Residential care	1 (2.78%)
Comorbidities ≥ 3	
Yes	35 (97.22%)
No	1 (2.78%)
GP Follow-Up	
Yes	25 (69.44%)
No	11 (30.56)
Readmission	
No	23 (63.89%)
Yes	13 (36.11%)

Note. Initial LOS: length of initial hospital stay (prior to readmission) in days.
Unknown: missing data for this variable.

3.2 Hypothesis One: Associations Between Gender, GP Follow-Up, and Readmission

For hypothesis one, two two-way chi-square tests of association were conducted to determine whether there was a statistically significant association between (1) gender and GP follow-up, and (2) gender and readmission. The results indicated that there was no significant difference in the proportion of males (67.86%) and females (75.00%) who followed-up with their GP, and the association was negligible, $N = 36$, $p = .990$ (Fisher's exact test), $\Phi = .06$. There was also no significant difference between males (35.71%, $N = 10$) and females (37.50%, $N = 3$) in readmission, $N = 36$, $p = .990$ (Fisher's exact test), $\Phi = .02$, and this association was also negligible.

3.3 Hypothesis Two: Association Between GP Follow-Up and Readmission

For hypothesis two, a two-way chi-square test of association was conducted to determine whether those who followed-up with their GP were less likely to be readmitted. The results indicated that of those who followed-up with their GP (see Table 1), there was no significant difference between those who were readmitted back into hospital (36.00%, $N = 9$) and those who were not (64.00%, $N = 16$), and this association had a negligible effect, $N = 36$, $p = .990$ (Fisher's exact test), $\Phi = -.00$.

3.4 Hypothesis Three: Relationships Between Intention to Follow-Up With GP, Actual GP Follow-Up, and Readmission

For hypothesis three, Pearson's point-biserial correlations were conducted to determine whether there was (1)a positive relationship between intention to follow-up with GP and actual GP-follow up, and (2) a negative relationship with intention to follow-up with GP and readmission. The results indicated that there was a small, positive association between intention to follow-up with GP and actual GP follow-up, however this was not statistically significant, $N =$

35, p = .359 (Table 2), and there was a small, positive association between intention to follow-up with GP and readmission, although this was not statistically significant, N = 35, p = .334 (Table 2), suggesting that there was a small effect in the opposite direction to the hypothesis.

3.5 Hypothesis Four: Relationships Between Emotional State, GP Follow-Up, and Readmission

For hypothesis four, six Pearson point-biserial correlations were conducted to determine whether there was a statistically significant negative relationship between DASS21 scores and GP-follow up, and a statistically significant positive relationship between DASS21 scores and readmission. The results indicated that there was:

(1) a small, positive association between depression and GP follow-up, although this was not statistically significant, N = 27, p = .436 (Table 2), suggesting that there was a small effect in the opposite direction to the hypothesis;

(2) a negative, but not statistically significant relationship between anxiety and GP follow-up, and the effect was negligible, N = 27, p = .836 (Table 2), suggesting that there was no association between anxiety and GP follow-up;

(3) a small, positive association between stress and GP follow-up, although this was not statistically significant, N = 27, p = .230 (Table 2), it was approaching a moderate effect size, suggesting that an effect was found in the opposite direction to the hypothesis; higher levels of stress were related to slighter higher GP follow-up;

(4) a small, negative association between depression and readmission, although not statistically significant, N = 27, p = .245 (Table 2), this was again approaching a moderate effect. This effect was in the opposite direction to the hypothesis; higher levels of depression was related to slightly lower readmission rates.

(5) no statistically significant association between anxiety and readmission, and this effect was also negligible, $N = 27$, $p = .813$ (Table 2), suggesting that there was no association between anxiety and readmission;

(6) a small, negative association between stress and readmission, although not statistically significant, $N = 27$, $p = .635$ (Table 2), suggesting that there was a small effect in the opposite direction to the hypothesis; higher levels of stress was related to slightly lower readmission rates.

3.6 Hypothesis Five: Relationships Between Health Locus of Control, GP Follow-Up, and Readmission.

For hypothesis five, six Pearson point-biserial correlations were conducted to determine whether there was (1) a statistically significant positive relationship between IHLOC and GP follow-up; (2) a negative relationship between PHLOC and GP follow-up; (3) a negative relationship between CHLOC and GP follow-up; (4) a negative relationship between IHLOC and readmission; (5) a positive relationship between PHLOC and readmission; and (6) a positive relationship between CHLOC and readmission. The results indicated that there was:

(1) a small, positive association between IHLOC and GP follow-up, although not statistically significant, $N = 28$, $p = .570$ (Table 2), suggesting that higher levels of IHLOC were related to slightly higher levels of GP follow-up;

(2) a small, negative association between PHLOC and GP follow-up. Although it was not statistically significant, $N = 28$, $p = .215$ (Table 2), this was approaching a moderate effect size, suggesting that higher levels of PHLOC was associated with a small to moderate decrease in GP follow-up;

(3) a moderate and statistically significant, negative association between CHLOC and GP follow-up, $N = 28$, $p = .048$ (Table 2), suggesting that higher levels of CHLOC were moderately related to lower levels of GP follow-up;

(4) a small, positive association between IHLOC and readmission, although not statistically significant, $N = 28$, $p = .428$ (Table 2). This suggests that a small effect was found in the opposite direction to that which was hypothesised, indicating that higher levels of IHLOC were related to slightly higher levels of readmission;

(5) a negligible, negative association between PHLOC and readmission and this was also not statistically significant, $N = 28$, $p = .688$ (Table 2). This suggests that there was no association between PHLOC and readmission;

(6) a small, positive association between CHLOC and readmission, although this was not statistically significant, $N = 28$, $p = .548$ (Table 2), indicating that higher levels of CHLOC were related to slightly higher levels of readmission.

Table 2

Pearson's Correlations and Point Biserial Correlations Between All Study Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	-										
2. Gender	-.04	-									
3. Depression	-.10	-.35	-								
4. Anxiety	-.14	.13	.23	-							
5. Stress	-.33	-.20	**.47***	**.43***	-						
6. IHLOC	-.04	.26	.15	**.52****	.22	-					
7. CHLOC	.17	.30	.23	.04	.00	.34	-				
8. PHLOC	.18	.03	.21	**.42***	-.11	**.55****	**.38***	-			
9. GP Intention	.06	-.18	-.03	**-.46***	-.00	-.10	-.26	-.05	-		
10. GP Follow-up	-.10	.06[a]	.16	-.04	.24	.11	**-.38***	-.24	.16	-	
11. Readmission	.03	.02[a]	-.23	-.05	-.10	.16	.12	-.08	.17	-.00[a]	-

Note. Bold font denotes significant result.
[a] Pearson chi-square coefficient.
* $p < .05$ (2-tailed), ** $p < .01$ (2-tailed).

3.7 Hypothesis Six: Psychological Predictors of GP Follow-Up

For hypothesis six, a multivariate standard logistic regression was conducted to determine the combined predictive ability of HLOC and DASS21 on the likelihood of GP follow-up after discharge from hospital, specifically, whether higher scores on IHLOC would predict an increased likelihood of GP follow-up, and whether higher scores of PHLOCCHLOC, depression, and stress would predict a decreased likelihood of GP follow-up. The model included five psychological predictor variables (based on correlations ≥ .10 with GP follow-up, see Table 2): IHLOC, CHLOC, PHLOC, Depression, and Stress. The overall model was statistically significant, $\chi^2(5, N = 27) = 11.13$, $p = .049$, and explained between 33% (Cox and Snell R^2) and 46% (Nagelkerke R^2) of the variance in GP follow-up status, correctly classifying 81.5% of cases

(Table 3). This indicates that the model was able to correctly predict patients who would follow-up with their GP. None of the predictor variables made a statistically significant unique contribution to the model on their own, however there were meaningful effects for three of the predictor variables: each unit increase in IHLOC was associated with a greater odds of GP follow-up, when controlling for all other predictor in the model, and depression was also associated with a greater odds of GP follow-up, when controlling for all other factors in the model (see Table 3). Each unit increase in CHLOC and PHLOC were both associated with a small decrease in the likelihood of GP follow-up, when controlling for all other predictors in the model (see Table 3). Stress alone was not predictive of any meaningful variance in GP follow-up (Table 3).

Table 3

Multivariate Standard Logistic Regression to Predict GP Follow-Up

Predictor Variable	*b*	b^*	Wald χ^2	*Df*	*p*	Exp (*β*) (*OR*)	95% CI [*LL*, *UL*]
Constant	1.46	2.06	0.50	1	.479	4.31	- -
IHLOC	0.27	0.17	2.52	1	.113	1.31	[0.94, 1.84]
CHLOC	-0.20	0.10	3.79	1	.051	0 .82	[0.67, 1.00]
PHLOC	-0.20	0.13	2.47	1	.116	0.82	[0.64, 1.05]
Depression	0.24	0.17	2.13	1	.145	1.27	[0.92, 1.76]
Stress	-0.01	0.15	0.00	1	.971	1.00	[0.74, 1.33]

Note. *N* = 27. The dependent variable is GP follow-up within 14 days of initial discharge coded 0 = No, 1 = Yes. *b* represents the unstandardized regression coefficient. b^* represents the standardized regression coefficient. *LL* and *UL* indicate the lower and upper limits of the 95% confidence interval.

3.8 Hypothesis Seven: Psychological Predictors of Readmission

For hypothesis seven, a multivariate standard logistic regression was conducted to determine the combined predictive ability of HLOC and DASS21 on the likelihood of 30-day readmission, specifically, whether higher scores on IHLOC would predict decreased likelihood of readmission, and whether higher scores on, CHLOC, depression, and stress would predict increased likelihood of readmission The model included four psychological independent variables (based on correlations ≥ .10 with readmission, see Table 2): IHLOC, CHLOC, Depression, and Stress. The overall model was not statistically significant, $\chi^2(4, N = 27) = 3.53$, $p = .474$, and explained between 12% (Cox and Snell R^2) and 17% (Nagelkerke R^2) of the variance in readmission status, correctly classifying 70.4% of cases. This indicates that the model was not able to significantly predict patients who would experience readmission. None of the predictor variables made a statistically significant unique contribution to the model (see Table 4).

Table 4

Multivariate Standard Logistic Regression to Predict Readmission

Predictor Variable	*b*	b^*	Wald χ^2	*df*	*p*	Exp (*β*) (*OR*)	95% CI [*LL*, *UL*]
Constant	-2.16	1.74	1.54	1	.214	0.12	- -
IHLOC	0.06	0.07	0.68	1	.410	1.06	[0.92, 1.23]
CHLOC	0.04	0.06	0.50	1	.482	1.05	[0.92, 1.18]
Depression	-0.21	0.17	1.46	1	.227	0.81	[0.58, 1.14]
Stress	0.02	0.14	0.02	1	.884	1.02	[0.78, 1.33]

Note. *N* = 27. The dependent variable is readmission within 30 days of initial discharge coded 0 = No, 1 = Yes. *b* represents the unstandardized regression coefficients. b^* represents the standardized regression coefficient. *LL* and *UL* indicate the lower and upper limits of the 95% confidence interval.

CHAPTER 4

Discussion

4.1 Overview

The aim of this study was to determine whether health control beliefs (HLOC) and emotional state (DASS21) would predict non-adherence to medical advice upon discharge (GP follow-up within 14 days of discharge) and readmission (30 days after initial discharge from hospital), among older Australian inpatients with comorbid CVD and diabetes. Investigating how emotional state and HLOC are related to GP follow-up and readmission provided valuable theoretical and clinical insights. The results and their clinical implications, along with suggestions for future research and the strengths and limitations of this study are discussed in this chapter.

4.2 Summary of Findings

4.2.1 Associations between gender, GP follow-up, and readmission.

Following the literature, it was unclear whether the rates of GP follow-up and readmission would be different for males and females. Our data found that there was no difference in GP follow-up or readmission between males and females. These results suggest that it may not be necessary to target interventions for reducing non-adherence to medical advice and readmissions at any one gender in older individuals with comorbid CVD and diabetes. However, because these findings did not coincide with those from Collins et al. (2017), Hughes and Witham (2018), and Monhart, Grunfeldova, Zvarova, and Jansky (2010) but did with others (Fleming, Gavin, Piatkowski, Chang, & Mukamal, 2014; Raum et al., 2012), future research including similar proportions of males and females is needed, in order to confirm the effect of gender on GP follow-up and readmission.

4.2.2 Association between GP follow-up and readmission.

For hypothesis two, it was predicted that that those who followed-up with their GP after discharge would be less likely to be readmitted (compared to those who did not follow-up with their GP). The results indicated that there was no difference in readmission between those who followed-up with their GP after initial discharge from hospital and those who did not. This data did not support the hypothesis or results from previous research that demonstrated that timely follow-up visits with a GP after hospital admission led to a lower likelihood of being readmitted within 30 days (Jackson et al., 2015; Leschke et al., 2012; Muus et al., 2010; Riverin et al., 2018; Sharma et al., 2010; Shen et al., 2017). These inconsistencies in the results between the current study and the aforementioned studies may be because in the current study the majority of participants (approximately two thirds) were observed to have actually followed-up with their GP after discharge (Table 1). Hence, perhaps this study represented a biased sample of individuals who demonstrate higher adherence to treatment advice than is generally observed among patients; notably on average only around 50% of patients adhere to treatment advice (Australian Department of Health and Ageing, 2010). The observed high rates of GP follow-up may have also been influenced by the informed consent process. Patients were fully informed of the primary outcomes of the study and that they would be followed-up (with researchers contacting their GP clinics to determine whether they had visited their GP, and checking hospital administrative data for readmissions); hence, this may have affected patients subsequent behaviour; motivating them to do the ‘right thing’ in an attempt to be viewed positively by the researcher (social desirability bias; Althubaiti, 2016).

The findings from the current study were however concurrent with DeLia et al. (2014) and Kashiwagi et al. (2012); they also found that GP follow-ups were not associated with

reductions in readmission rates. In these studies, approximately 50% of patients discharged from hospital had an outpatient follow-up appointment within 14 days of discharge. Furthermore, they found that 14% of patients were readmitted to hospital within 30 days and of those who were readmitted, 11% had a follow-up appointment, compared to 10% who did not have a follow-up appointment (Kashiwagi et al., 2012). In the current study, one third of patients were readmitted within 30 days (see Table 1), and of those who were readmitted 69.23% had a follow-up, compared to 30.77% who did not. Further research is needed to explore the relationship between GP follow-up and readmission.

4.2.3 Relationships between intention to follow-up with GP, actual GP follow-up, and readmission.

For hypothesis three, it was predicted that patients reporting greater intentions to follow up with their GP would have higher rates of actual GP follow-up and lower readmission rates. The results provided tentative support for the first part of the hypothesis; greater intentions to follow-up with a GP had a small association with higher rates of actual GP follow-up (although this was not statistically significant, potentially due to the sample size). There was no support found for the second part of this hypothesis, instead, greater intentions to follow-up with a GP demonstrated a small association in the opposite direction; a small positive relationship with readmission. This finding may reflect that patients who had greater intentions to follow-up with their GP had so because they were experiencing more negative health issues or comorbidities, or were anticipating a negative outcome because they had been engaging in unhealthy behaviour (smoking, consuming alcohol, unhealthy eating), and consequently experienced higher readmission rates than patients who had lower intentions of seeing their GP upon discharge.

4.2.4 Relationships between emotional state, GP follow-up, and readmission.

For hypothesis four, it was predicted that higher levels of emotional state (depression, anxiety, and stress) would be associated with lower levels of GP follow-up and higher rates of readmission. The findings did not support this hypothesis; contrary to this, anxiety was observed to have no effect on GP follow-up or readmission. Furthermore, patients who reported higher levels of depression and stress were found to have higher levels of GP follow-up and lower rates of readmission (the opposite direction to that hypothesized). Although this was not significant, it was a small effect. Our findings for the relationships between emotional state, GP follow-up, and readmission, did not replicate the previous findings in the literature where negative emotional state caused increases in the susceptibility of medical non-adherence and readmissions (Alavi et al., 2017; Daratha et al., 2012; Edmondson et al., 2014; Huynh et al., 2015; Mudge et al., 2011). Furthermore, our findings for the relationships between depression, stress, and GP follow-up align with previous studies demonstrating that patients with CVD and other comorbidities were more likely to utilize healthcare services (GPs, pharmacies). However the results did not support previous findings demonstrating that patients experiencing depression, anxiety, and stress were more likely to be readmitted (Alavi et al., 2017; Daratha et al., 2012; Edmondson et al., 2014; Huynh et al., 2015; Morrissey, 2019; Mudge et al., 2011; Nosova & Sutton, 2018; Pederson, Majumdar, Forhan, Johnson, & McAlister, 2016). Some explanations for our findings may be that patients with higher stress levels may have greater levels of concern and awareness for the importance of adhering to the medical advice provided to them upon discharge. Hence, patients with higher stress may engage in healthy behaviour and avoid unhealthy behaviour, adhere to medication, detect symptoms early; therefore, they are also more likely to follow-up with their GP and less likely to experience readmission. Additionally, patients with higher levels of

depression may require an appointment with their GP based on their depression; engage in fewer activities, be less physically active, rest more, and be less likely to overexert themselves; hence less likely to be readmitted.

4.2.5 Relationships between health locus of control, GP follow-up, and readmission.

For hypothesis five, it was predicted that stronger beliefs in IHLOC would be associated with higher levels of GP follow-up, and stronger beliefs in PHLOC and CHLOC would be associated with lower levels of GP follow-up. It was also predicted that higher levels of IHLOC would be associated with decreases in readmission, and stronger beliefs in PHLOC and CHLOC would be associated with increases in readmission.

The findings presented mixed evidence for this hypothesis, the data supported some parts and opposed the others. The findings provided tentative support for the hypothesis that higher beliefs in IHLOC were associated with higher levels of GP follow-up; this was a small, but not statistically significant effect. Also consistent with this hypothesis, higher beliefs in CHLOC was significantly, moderately and negatively associated with GP follow-up. There was also tentative evidence to suggest that there was a small positive association between CHLOC and being readmitted, although this was not statistically significant. These findings are concurrent with Lilla et al.'s (2017) systematic review which noted that IHLOC was continuously found to enhance medical adherence, whilst CHLOC was generally linked to decreases in medical adherence and an increased likelihood of hospital admission. This suggests that higher internal health control beliefs are promotive of adherence, whilst higher external beliefs are detrimental to adherence and fostering of readmission. Perhaps these patients are less likely to take action to manage their health, or engage in health promoting behaviour, because they are less likely to feel in control over their health (leave it in the hands of fate) and may the lack self-efficacy (the

belief in one's ability to execute necessary behaviour/s to achieve a specific goal; Bandura, 1977) to make the necessary lifestyle changes (Cobb-Clark, Kassenboehmer, & Schurer, 2014).These outcomes demonstrate significant implications for clinical practice: understanding patients' HLOC may be indicative of their future health behavior, namely adherence to medical advice.

Contrary to what was hypothesized, we found tentative evidence to suggest that, IHLOC was positively associated with readmission, and although not statistically significant, this had a small effect. This implies that despite the proposed link between IHLOC and the reduced risk of undesirable health outcomes and behaviours, such as non-adherence (Lilla et al., 2017), obesity, and psychological distress (Gale, Batty, & Deary, 2008), IHLOC may not serve as a protective factor against readmission. Having an IHLOC does not necessarily mean that patients will consistently make the 'right' choices concerning their health, despite the belief that they themselves are responsible for this. Engaging in healthy behaviour is not always the easy choice and often requires purposive effort and public health initiatives (Young, 2014). Additionally, the probability of readmission for older populations with two (or more) comorbid conditions is already heightened and there are some outcomes that cannot be completely avoided, despite engaging in positive health behaviours, for example viral infections. Therefore, some causes of readmission may have been unrelated to patient's CVD and diabetes conditions.

The findings also found support for the hypothesis that higher levels of PHLOC would be associated with lower GP follow-up; higher beliefs in PHLOC had a moderate (although not significant, based on a reduced sample size) negative association with GP follow-up. This may be because patients who hold beliefs about others being in control of their health (family, friends, doctors) typically do not view their own behaviours as a determinant of their health outcomes; so

they do not see the significance of engaging in healthy behaviour (smoking cessation, exercise, health eating), including adhering to medical advice, regardless of being advised by a clinician that it is in their best interests to do so (Wallston, 2005). PHLOC was found to have no association with readmission. This finding is reflective of the inconsistent findings for the relationship of PHLOC on hospitalizations in the literature, which demonstrates both positive (Bazargan et al., 1998; Chambers et al., 2013; Lilla et al., 2017; Mautner et al., 2017; Omeje & Nebo, 2011) and negative effects on adherence and admissions (Lilla et al., 2017; Taher et al., 2015). These inconsistencies in the literature might reflect differences in patients' references for who these powerful others are (family, friends, or doctors) and whether these powerful others are encouraging of/impairing adherence and healthy behaviour (Wallston, 2005).

4.2.6 Psychological predictors of GP follow-up and readmission.

As predicted in hypothesis six, some emotional state and HLOC variables were found to significantly predict the likelihood that patients would follow-up with their GP. However, some of the effects were found to be in the opposite direction to what was hypothesized. The model contained five psychological predictor variables (IHLOC, CHLOC, PHLOC, Depression, and Stress). Although none of the psychological variables shared a statistically significant amount of unique variance in GP follow-up alone (potentially due to the study being underpowered), three of these predictors had a clinically meaningful effect whilst controlling for all other factors in the model. IHLOC was the strongest predictor of GP follow-up, indicating that patients who had an IHLOC were more likely to follow-up with their GP. CHLOC was predictive of a slightly lower odds of GP follow-up, controlling for all other factors in the model. Perhaps this is because individuals with internal beliefs (compared to external) have been shown to take responsibility for their health, adhere to medical advice, and have higher self-efficacy, which allows them to

take the essential steps to manage their health conditions (Bandura, 1977; Cross et al., 2005; Lilla et al., 2017; Omeje & Nebo, 2011). Furthermore, consistent with what was hypothesized, the model suggested that PHLOC was predictive of a slightly lower odds of GP follow-up, and contrary to the hypothesis, depression was predictive of a greater odds of GP follow-up, when controlling for all other factors in the model. Stress alone was not found to predict GP follow-up. This was inconsistent with the hypothesis, and the results from the correlation analysis. This opposes the dominant findings that shows that patients who are non-adherent tend to have higher depression and stress scores than those who do adhere (Goldstein et al., 2017; Holvast et al., 2019; Mendes et al., 2017).

The results did not find support for hypothesis seven; emotional state and HLOC were not found to predict readmission. The overall model contained four psychological predictors (IHLOC, CHLOC, Depression, and Stress), based on the previous correlations. The model was not statistically significant, indicating that depression, stress, IHLOC, and CHLOC were not able to predict readmission. This suggests that something else may be mediating the relationship, perhaps patients, age, number of comorbidities, and/or severity of their conditions may have a larger impact on readmission. More research is needed to substantiate such a claim.

The clinical implications of these results suggest that HLOC may be an important factor to consider when determining whether patients being discharged from hospital are likely to adhere to the medical advice provided to them. Furthermore, increasing patients' beliefs in their level of control over their own health (IHLOC) may increase the likelihood that they will adhere to the advice. Further research with more power is needed to determine whether emotional state and HLOC can predict readmission, or whether it is in fact ineffective at doing so, and something else is mediating the relationship.

4.3 Further Limitations, Suggestions for Future Research, and Strengths

Some methodological limitations should be considered when interpreting the results found in this study. Foremost, the sample size was small and thus the study was insufficiently powered to detect significant small to moderate effects, however this was taken into consideration when interpreting the findings. Numerous statistically non-significant effects were found; however, we referred to the effect sizes throughout our interpretations which are not influenced by sample size and are more informative than null hypothesis significance values (Cumming, Fidler, Kalinowski, & Lai, 2012). Next, this was a single-centre study and consisted of mostly male and Australian born participants, therefore the results may not be generalizable to other patient groups, genders, or cultures.

Furthermore, the utilization of self-report measures (GP intention, HLOC, DASS21) means the data may be impacted by the influence of the social desirability bias, whereby participants under-report their levels of psychological distress in an effort to respond in a way that is more socially desirable (Drapeau, Boyer, & Diallo, 2011). Moreover, participants were informed of the specific aims of the study and that they were being followed-up, therefore the study may be vulnerable to demand effects (Nichols & Maner, 2008), as it may have led participants into altering their behaviour in making conscious efforts to conform to the study expectations (e.g. follow-up with their GP, adhere to medical advice, engage in healthy behaviour, and try hard to avoid being readmitted). Blinding participants to the study's aims and outcomes may be beneficial for future research. It should also be noted that the number of actual GP follow-ups may have been higher than recorded, as participants may have visited a clinic other than the one who's details were provided to us. Future studies may address this by phoning participants to see if they had visited a different clinic to that initially specified. Additionally, it

was apparent that some of the items from the DASS21 overlapped with patient's CVD/diabetes symptoms, e.g.: '… Dryness of the mouth', '… Breathing difficulty', '… Trembling', and '…action of my heart in the absence of physical exertion'. This may have caused some confusion and affected patients' responses to the DASS21, overinflating their levels of psychological distress.

Future research should aim to include a larger sample size, equal proportions of males and females, and multiple centres. A larger sample size will allow control of potentially confounding variables (e.g. number of comorbidities, disease severity, cognitive impairment, postcode, SES). Successive studies might benefit from modifying the dichotomous categorization (Yes/No) of the two primary outcomes (GP follow-up and readmission) into continuous measures, so that the time it took (days) for participants to see their GP and be readmitted can be captured. Forthcoming studies may also consider incorporating qualitative methods of analysis (interviews, thematic analysis) for more in-depth insights into the reasons participants followed-up with their GP (e.g. adhering to discharge advice, adverse event, clinic contacted patient) and why they did not (e.g. not feeling well, forgot), and the nature of the follow-up (what topics were discussed at the GP follow-up, e.g. medication modification), reasons for readmission (unhealthy behaviour), and patients' experiences with the service of care. However, this is not to discount the quantitative methods used in this study, as these are useful for gaining an initial understanding of the issue and providing an indication of where further exploration is needed.

Despite its limitations, this study is a real-world clinical study and has contributed to the gaps and limitations of the current literature, addressing the lack of attention given to the co-occurrence of CVD and diabetes. To date diabetes research has predominantly focused on

physical factors, and although these are crucial, there has been little recognition of the psychological influences on health outcomes (Przybylski, 2010). The results from this study help to identify patients at risk for non-adherence to medical advice following discharge from hospital and may help inform local health authorities of where the provision of healthcare resources interventions is necessary.

4.4 Conclusions

The findings from this study provide important clinical implications for patients, healthcare professionals (particularly those in hospital settings), and the government, as well as insights and suggestions for future research in a currently unsubstantiated field, investigating the associations between HLOC, emotional state, non-adherence (GP follow-up), and short-term hospital readmissions. First, there is high rate of readmissions among older adults with comorbid CVD and diabetes, suggesting that current initiatives may not be effective, and further support and research is needed to understand and reduce readmissions in this population. Second, over one third of patients do not follow-up with their GP within 14 days of discharge from hospital, hence, do not adhere to the medical advice provided to them upon discharge. However, this was not found to be associated with readmission. Third, health control beliefs may play an important role in predicting and facilitating patients' adherence to medical advice upon discharge (GP follow-up); IHLOC and depression improves adherence, whilst PHLOC and CHLOC reduces adherence. Although emotional state and health control beliefs were not able to predict readmission, there were some meaningful relationships between these variables; CHLOC was associated with increases in readmission, whilst depression and stress were associated with decreases in readmission. Further large-scale studies are needed in order to accurately quantify these effects. Future interventions should consider targeting patients with high chance control

beliefs (CHLOC) and/or low internal control beliefs (IHLOC) by improving their perception of control over their health outcomes. Health professionals involved in the discharge process and GPs involved in patient aftercare should aim to moderate patients' perceptions of control over their health conditions by encouraging them to become active participants in their medical care. Furthermore, the present study demonstrated that depression and stress showed small associations with increases in GP follow-up and decreases in readmission, suggesting that screening for individuals with mood disorders may not assist in predicting these outcomes, though further research is needed to verify this. Finally, further large-scale, longitudinal, prospective studies are required to confirm the generalizability of these findings to the wider population of older adults with comorbid CVD and diabetes (and subsequently for other common comorbid conditions) and address the gaps and limitations from this study and previous studies. This is essential in order to implement interventions to prevent and/or reduce non-adherence and short-term hospital readmissions in high-risk individuals with comorbid CVD and diabetes, and in turn improve patient outcomes and reduce the strain on our healthcare system.

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Appendix A: Participant Information and Consent Form

Assessment of factors affecting care integration and outcomes in inpatients with diabetes and cardiovascular disease

Principal Investigator: [redacted]

Investigators: [redacted]

[redacted]

Version: 1.1

Version Date: 12th March 2019

Introduction

You are being invited to take part in this study because you have been admitted to hospital and you have diabetes and cardiovascular disease e.g. diseases affecting the heart or blood vessels. When patients have these conditions, it is important for them to have regular follow ups and ensure that their care is coordinated.

The aim of this study is to review a number of physical, social, psychological and other factors and to see how they affect the integration/coordination of your care, and whether you are readmitted back to hospital in the next 12 months.

If you agree to take part in this study, you will be asked a number of questions during this admission and then we will contact you and your general practitioner a number of times over the next year.

Participation is voluntary, you do not have to participate if you do not wish to. If you do choose to participate, you may withdraw from the trial at any time without it affecting your care in any way.

You do not have to decide today whether you want to participate in this study. Before deciding to take part, you may want to talk to someone that you feel comfortable talking with about this study and take time to reflect on whether you would like to participate or not. If there is anything you do not understand, please feel free to ask. If you have questions later, you can ask them at any time.

Study procedures

Initial assessment in hospital

If you are happy to take part in this study, we will ask you to sign the consent form. After giving consent you will be asked to answer questions regarding a range of different factors including questions relating to your current health care management, physical frailty, psychological wellbeing, falls, nutrition, your understanding of written health information, how you manage looking after yourself, and memory. Some of this information may have already been asked by nursing staff, so we will look up that information from your notes rather than asking you again. This information will be collected by a university student.

Some people find some of these questions e.g. about their mood, or memory a bit upsetting. If you are distressed at any time, you can ask to stop, or take a break, without it affecting your care in any way.

These questions will take approximately 30-60 minutes, and if you get tired, we can take a break and come back later. Some of the questions you can fill out yourself, so they can be done any time during this admission.

We will also collect information from your notes about your medications, other medical conditions, and the results of some blood tests you have had performed.

Assessments after hospital discharge

2 weeks after discharge from hospital we will contact your general practitioner to see if you have had an appointment or not.

We will contact you approximately 30 days after discharge by phone or mail to ask you some questions about your appointment with your general practitioner. This will involve approximately 10 questions and will take about 10 minutes.

6 months after discharge we will send you a questionnaire by post to ask you about your general care coordination, and about the general care of your condition. This questionnaire will take approximately 20-30 minutes to complete.

We will also review the hospital administration system to see if you have had any readmissions to hospital for the next 12 months.

What risks are associated with this study

This study involves asking you a number of questions now and following you up for a year with further questions in a month and 6 months. As such, the risks are quite low. Some patients may find some of the questions regarding their mood and memory a bit upsetting. If you find yourself being made uncomfortable with the questions, please let the researcher know, and you can either take a break or stop. Not completing the questioning will not affect your care in any way.

Confidentiality

The information/data that we collect from you in this study will be kept confidential. Only the researchers and clinicians involved in this study will have access to your information. Paper documents will be stored in locked storage at the Royal Adelaide Hospital and electronic information will be stored on SA Health servers which will be password protected. The results from this study will be published but will not include any confidential information that may allow for participants to be identified, and personal details such as your name will not be included.

Right to Refuse or Withdraw

Participation is voluntary. You do not have to take part in this research if you do not wish to. If you do choose to participate, you have the right to withdraw from the trial at any time, without affecting your care.

Who to Contact

If you have any questions about the study or experience any study-related issues, you may contact:

[redacted]

If you have any questions regarding your rights as a research participant, please contact:

Central Adelaide Human Research Ethics Committee on (08) 7117 2229.

Ethics Approval

This research study has been reviewed and approved by Central Adelaide Human Research Ethics Committee and The University of Adelaide's Human Research Ethics Committee.

Consent form for: Assessment of factors affecting care integration and outcomes in inpatients with diabetes and cardiovascular disease

Investigators: [redacted]

1. The nature and purpose of the research project has been explained to me. I understand the risks of the study and agree to take part

2. I understand that I may not benefit from taking part in the trial.

3. I understand that, while information gained during the study may be published, I will not be identified, and my personal results will remain confidential.

4. I understand that I can withdraw from the study at any stage and that this will not affect my medical care, now or in the future.

5. I have had the opportunity to discuss taking part in this investigation with a family member or friend.

Name of Participant: _____

Participant Signature: _____

Date: _____

I certify that I have explained the study to the participant and consider that he/she understands what is involved.

Name of Researcher: _____

Researcher Signature: _____

Date: _____

Appendix B: Questionnaire

Assessment of factors affecting care integration and outcomes in inpatients with diabetes and cardiovascular disease

Assessment Form

Study ID #: _____

Room #: _____

UR #: _____

Full Name: _____

Age: _____

Gender: _____

Country of Birth: _____

Interpreter needed: Yes/No

Living situation:

Alone With someone Residential Care

Postal Address: _____

Suburb: _____ Postcode: _____

Phone: _____

Email: _____

Preferred method of contact for follow-ups: Mail Phone

GP Practice: _____

GP Name: _____

Suburb: _____

Smoking status:
Current Ex-Smoker Never

How likely are you to see your general practitioner within 2 weeks of discharge from hospital?

Very unlikely Unlikely Neutral Likely Very likely

Number of different GP practices seen 12 months _____
Number of different pharmacies seen 12 months _____
Number of different specialists seen in last 12 months _____

Has patient had Home medicines review i.e. pharmacist reviewing their medicines in their home?
Yes No Don't know

Is GP chronic disease care plan in place?
Yes No Don't know

1. In the past year how many times have you been admitted to a hospital?
   _____

2. In general, how would you describe your health? (circle):
   Excellent Very Good Good Fair Poor

3. With how many of the following do you require help? (circle):
   Meal preparation Shopping Transport Telephone
   Housekeeping Laundry Managing Money Taking Medications

4. When you need help, can you count on someone who is willing & able to meet your needs?
   Always Sometimes Never

	Yes	No
5. Do you use 5 or more prescription medications?		
6. At times, do you forget to take your prescription medications?		
7. Have you **recently** lost weight such that your clothing has become looser?		
8. Do you **often** feel sad or depressed?		
9. Do you have a problem with losing control of urine when you don't want to?		
10. **Two weeks** ago were you able to: a) Do heavy work around the house like washing windows, walls or floors without help?		
b) Walk up and down stairs to the second floor without help?		
c) Walk 1km without help?		

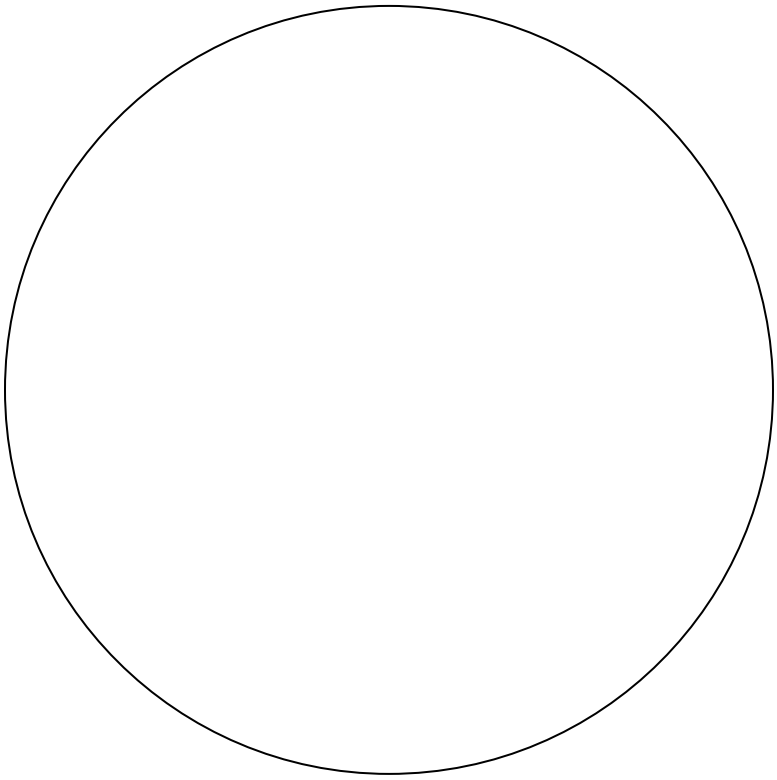
How many falls have you had in the last 12 months? _____

Current weight: _____

Weight 3-6 months ago: _____

Current height: _____

Please imagine that this pre-drawn circle is a clock. I would like you to place the numbers in the correct positions then place the hands to indicate a time of “ten past eleven”



Barthel Index Scoring Form

Patient Name: _____ Rater Name:_____ Date:_____

FEEDING
0 = unable
5 = needs help cutting, spreading butter, etc., or requires modified diet
10 = independent

BATHING
0 = dependent
5 = independent (or in shower)

GROOMING
0 = needs to help with personal care
5 = independent face/hair/teeth/shaving (implements provided)

DRESSING
0 = dependent
5 = needs help but can do about half unaided
10 = independent (including buttons, zips, laces, etc.)

BOWELS
0 = incontinent (or needs to be given enemas)
5 = occasional accident
10 = continent

BLADDER
0 = incontinent, or catheterized and unable to manage alone
5 = occasional accident
10 = continent

TOILET USE
0 = dependent
5 = needs some help, but can do something alone
10 = independent (on and off, dressing, wiping)

TRANSFERS (BED TO CHAIR AND BACK)
0 = unable, no sitting balance
5 = major help (one or two people, physical), can sit
10 = minor help (verbal or physical)
15 = independent

MOBILITY (ON LEVEL SURFACES)
0 = immobile or < 50 yards
5 = wheelchair independent, including corners, > 50 yards
10 = walks with help of one person (verbal or physical) > 50 yards
15 = independent (but may use any aid; for example, stick) > 50 yards

STAIRS
0 = unable
5 = needs help (verbal, physical, carrying aid)
10 = independent

TOTAL SCORE= _____

Clinical Frailty Scale*

1 **Very Fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 **Well** – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.

3 **Managing Well** – People whose **medical problems are well controlled,** but are **not regularly active** beyond routine walking.

4 **Vulnerable** – While **not dependent** on others for daily help, often **symptoms limit activities.** A common complaint is being "slowed up", and/or being tired during the day.

5 **Mildly Frail** – These people often have **more evident slowing,** and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 **Moderately Frail** – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.

7 **Severely Frail** – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 **Very Severely Frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9. **Terminally Ill** - Approaching the end of life. This category applies to people with **a life expectancy <6 months**, who are **not otherwise evidently frail.**

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.
2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

DALHOUSIE UNIVERSITY *Inspiring Minds*

CALHN

☐ RAH ☐ TQEH

☐ HAMPSTEAD ☐ ST MARGARETS

COGNITIVE IMPAIRMENT SCREENING TOOL

PATIENT LABEL

Unit Record No.: _____

Surname: _____

Given Names: _____

Date of Birth: _____ Sex: _____

On admission screen all patients 65+ years (50+ years ATSI) with the AMTS and CAM tool.

If +ve AMTS screen with no known diagnosis of dementia, advise medical officer.

If +ve CAM Screen notify medical officer immediately.

AMTS & CAM GUIDE ON REAR

Abbreviated Mental Test Score (AMTS)

Hodkinson, HM (1972). "Evaluation of a mental test score for assessment of mental impairment in the elderly". Age and Ageing 1 (4): 233–8.

QUESTION — TIME / DATE	/ /	/ /	/ /
1. How old are you?			
2. What is the time (nearest hour)?			
Give the patient an address and ask them to repeat it at the end of the test: 42 West Street			
3. What year is it?			
4. What is the name of this place?			
5. Can the patient recognise two relevant persons? (e.g. Nurse / Doctor or relative)			
6. What is your date of birth?			
7. When did the second world war start (1939)?			
8. Who is the current Prime Minister?			
9. Count down backwards from 20 to 1			
10. Can you remember the address I gave you?			
TOTAL SCORE (Maximum score is 10) ≤7 indicates CI			
Initial			

A score of 7 or less indicates cognitive impairment

Form A

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1=STRONGLY DISAGREE **(SD)**	4=SLIGHTLY AGREE **(A)**
2=MODERATELY DISAGREE **(MD)**	5=MODERATELY AGREE **(MA)**
3=SLIGHTLY DISAGREE **(D)**	6=STRONGLY AGREE **(SA)**

Number	Question	SD	MD	D	A	MA	SA
1	If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2	No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3	Having regular contact with my physician is the best way for me to avoid illness	1	2	3	4	5	6
4	Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5	Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am in control of my health.	1	2	3	4	5	6
7	My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8	When I get sick, I am to blame.	1	2	3	4	5	6
9	Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10	Health professionals control my health.	1	2	3	4	5	6
11	My good health is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14	Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15	No matter what I do, I 'm likely to get sick.	1	2	3	4	5	6
16	If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17	If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18	Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

		Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of time	Applied to me very much, or most of the time
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3