A Sequential Explanatory Mixed Methods Study on the Relationships of Depression, and Generalised Anxiety Disorder, with Levels of Alcohol Consumption in Older Adults

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A thesis presented to the University of Dublin, Trinity College Dublin, for the Degree of Doctor in Philosophy.

Trinity College Dublin 2020

Declaration

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Summary

Background: Depression and generalised anxiety disorder (GAD) are frequently underdiagnosed and undertreated in the older adult population (this study defines older adults as being aged 65, other definitions used in the literature include being aged 50 and over, or 60 and over). The older adult population is one of the fastest growing worldwide. Mental health problems in older adults have been referred to as an emerging public health crisis. Further, harmful drinking is under-recognised and undertreated in this population, to the extent that it has been called a silent epidemic. This thesis aimed to address these issues by determining the associations of threshold, and subthreshold depression (i.e. significant symptoms of depression that do not meet the criteria for threshold depression), and GAD, with alcohol consumption, and the factors influencing these associations in an Irish community dwelling population aged 65 and over. This was further achieved by contextualising them through the perspectives of healthcare practitioners. While the associations of depression and GAD with alcohol are commonly assumed, the associations between them in the presence of factors known to influence these mental health disorders, and the context behind these associations, is under-researched in this population.

Methods: A mixed methods sequential explanatory design was chosen to achieve this aim. The sample for the quantitative phase was adults living in Ireland aged 65 and over, from the second wave of The Irish Longitudinal Study of Ageing (TILDA) (N=3499). The Centre for Epidemiologic Studies Depression Scale was used to measure depressive symptoms. GAD was measured using the Penn Worry State Questionnaire. Alcohol consumption was measured by quantity and frequency. This was coded and categorised as abstinence, moderate, at-risk, and harmful drinking. Reduction in consumption over the last two years was also categorised. Chi square tests and logistic regressions were used to examine bivariate relationships. Logistic regressions were used to examine the relationships of the GAD and depression variables with alcohol while controlling for multiple sociodemographic, physical, and psychological health predictors (23 to 25 depending on the model). In the qualitative phase semi-structured interviews were conducted with 10 healthcare

practitioners about older adult mental health, particularly depression, its association with alcohol consumption, and the role of alcohol in older adult mental health. These interviews were analysed using thematic analysis.

Findings: Harmful drinking, in addition to not reducing alcohol consumption over the past two years, was one of nine risk factors associated with threshold depression (OR: 4.90; 95% CI: 1.22-19.65). While five factors did have an association with subthreshold depression, there was no significance between any alcohol consumption and this form of depression. Drinking moderately was associated with lower levels of GAD (OR: 0.64; 95% CI: 0.42-0.96) along with five other factors. Two main themes emerged in the qualitative analysis, Loss and Denial. Loss had three subthemes: loneliness, loss of meaning in life, and loss and harmful drinking. Denial also had three subthemes: denial of depression, denial of drinking, and denial as a way to manage depression, harmful drinking, and thus poor physical health.

Discussion: Integration of the two phases suggests that maladaptive coping with losses common to older adulthood can result in the development of depression and co-occurring harmful drinking. Further, denial may play an important role in the maintenance of this co-occurrence, the effects of it on physical health, and the underdiagnosis of older adult depression and harmful drinking.

Conclusions and Implications: The association of harmful drinking and depression illustrates the importance of screening for depressive symptoms and harmful drinking in the older population, while the themes of Loss and Denial illustrate this association's complexity. There is a need to increase health care providers' awareness of older adult mental health issues and harmful drinking, and to increase awareness of these issues among older adults themselves. Stronger links between the community, primary and secondary care practitioners may assist in this by providing mental health education for health care providers and older adults, mental health screening for older adults in the community, and providing more structured routes toward diagnosis.

Acknowledgements

I would like to thank my supervisors, Dr. Gabrielle McKee and Dr. Louise Doyle, for their support and guidance through these past few years. I am grateful to The Irish Longitudinal Study of Ageing (TILDA) for granting me access to its data, and am very grateful to the healthcare practitioners who gave up their time to be interviewed for the second phase of the thesis, and of course to the study gatekeeper. I would also like to acknowledge the School of Nursing and Midwifery for funding this thesis through the Postgraduate Research Studentship. Finally, special thanks to my family, particularly my mom, Carmel, and my sister, Sarah, and my friends for their encouragement and support, and to my dogs, Prince and Pepsi, who passed away in the first two years of this thesis, and Louis, who made sure I took time out to take him for walks in the last few weeks before submission.

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Chapter One: Introduction and Thesis Outline

Older adult mental health is often overlooked by healthcare professionals and older adults themselves (Lamasy et al, 2013). The two mental health disorders in this study, depression and generalised anxiety disorder (GAD), are under-diagnosed in the 50 and over population (Barrett et al, 2011; Mackenzie et al, 2011). In addition, problem drinking in this age group is under-recognised (Donoghue et al, 2014). Compounding this lack of recognition, there is a relative scarcity of research on the associations between mental health and alcohol consumption in older adults aged 65 and over (Rakshi, Wilson, & Burrow, 2011; Wu & Blazer, 2013; Boneveski et al, 2014, Vaughan, Robbins, & Escobar, 2014). Moreover, there is a lack of qualitative research on the perspectives of healthcare practitioners on their older patients' alcohol consumption, and on the association between this consumption and these mental health disorders.

This lack of attention is particularly significant as the global number of adults aged 60 and over is predicted to double by 2050 (World Health Organisation, 2011). This makes older adults the fastest growing population worldwide. As this population grows, so might their mental health problems, especially if they continue to be undertreated. In Ireland, older adult depression is estimated to increase by more than double by 2036 (Central Statistics Office, 2004). This population's mental health has been called an emerging public health crisis (Bartels, & Symer, 2002), while problem drinking in this age group has been previously described as a silent epidemic (O'Connell, 2003).

There are a number of possible explanations for the under-diagnosis of mental health problems in older adults. These range from high rates of

comorbidity (Nutt et al, 2006, Burroughs et al, 2006), to a differing presentation to younger populations (Law, Laidlaw, & Peck, 2010; Hybels, Landerman, & Blazer, 2012; Allan, Valkanova, and Ebmeier, 2014), to ageism (Bodner, Palgi, & Wyman, 2018) or stigma (Conner et al, 2010). While very few studies have analysed the relationship between GAD and alcohol consumption in this population, the alcohol and depression association has received greater attention. The finding of this latter body of literature, however, is mostly inconclusive. This may partly be due to the focus often being placed on alcohol consumption, and its predictors, with a subsequent lack of inclusion of predictors for depression (Sacco et al, 2009; Vaughan et al, 2014). It is important to understand the relationships between these disorders and alcohol consumption, particularly drinking beyond the recommended guidelines, so as to inform the provision of healthcare, and improve diagnosis rates of these disorders and harmful drinking in this population.

With the analysis of The Irish Longitudinal Study of Ageing's database, this thesis examined the associations of GAD, threshold, and subthreshold depression, with abstinence, moderate, at-risk and harmful drinking, while determining other factors that influence these associations in an older Irish population. The wide range of variables included in the analysis assisted in providing a more definitive finding on these associations than that found in previous research. Deriving from the quantitative phase, the qualitative phase analysed the relationship between depression and harmful drinking from the perspectives of healthcare practitioners. The findings of this thesis may inform policy and healthcare and, by doing so, assist in preparing for the increasingly serious public health concern of under-diagnosis of mental health problems in

this population.

Aim

The aim of the thesis was to determine and explain the associations of threshold, and subthreshold, depression, and generalised anxiety disorder, with alcohol consumption; and the factors influencing these associations in an Irish population aged 65 and over.

Objectives

1) What is the relationship between threshold depression and alcohol consumption, controlling for relevant factors?

2) What is the relationship between subthreshold depression and alcohol consumption, controlling for relevant factors?

3) What is the relationship between generalised anxiety disorder and alcohol consumption, controlling for relevant factors?

4) To explore the perspectives and beliefs of healthcare practitioners regarding their professional experience of older adult mental health and alcohol consumption.

5) To explore healthcare practitioners' perceptions of the role of alcohol consumption in older adult depression.

Design

The design for the thesis is sequential, explanatory, mixed methods (Ivankova, Cresswell, & Stick, 2010). This design was chosen because neither quantitative nor qualitative methods alone were sufficient to capture the

complexity of the relationship between older adult mental health and alcohol consumption.

Thesis outline

The thesis is comprised of six chapters, including this introductory chapter. The second chapter reviews the literature on GAD and its association with alcohol consumption in the older adult population and, as this topic has not received much research attention, it is supplemented by literature on this association in a general adult population. The second part of the literature review can be found in chapter three, which reviews previous research on threshold and subthreshold depression and their association with alcohol in the older population. The fourth chapter outlines the philosophical and practical rationale for the use of a mixed methods sequential explanatory design. The methods used for each phase of the thesis are reported. Ethical approval is stated. The fifth and sixth chapters present the findings of the quantitative and qualitative analyses. In the seventh chapter, the findings of the two phases are discussed and interpreted in the context of the wider research literature, and the discussion of the two phases is integrated.

Chapter Two: Literature Review on GAD and Alcohol

While the primary method of diagnosis for a mental health disorder consists of the recognition of its symptoms, the identification of risk factors and comorbidities can assist in this process. Therefore, the purpose of this chapter was to critically review the available literature on the co-occurrence of GAD and alcohol use, and the potential mechanisms which might lead to this association. This was a narrative review based on a systematic search of the literature. Only a small number of studies were found to measure for GAD in the older population. Slightly more were identified that assessed the relationship between unspecified anxiety and alcohol use. To avoid confusion, these two terms—GAD and unspecified anxiety—will be used throughout the chapter according to the study under review. Further, as the literature on GAD and alcohol in the older population was lacking, studies on general adult populations were also reviewed. The aim of this was to identify any trends that might transcend the difference in age.

In the past, the age of 50 and over was designated as defining the older adult, while the United Nations defines the older adult as being aged at least 65 (World Health Organisation, 2002). Most developed countries, including Ireland, define the older adult as being 65 or over (World Health Organisation, 2002). This is the age that is used in this thesis. However, as different studies use either 50, 60 and 65 to denote old age, these specific age ranges were noted when cited.

Before the main review, measures for alcohol consumption used in this thesis, and those most frequently used in the literature were briefly defined. Following this, the prevalence of at-risk and harmful drinking and alcohol

problems were discussed, as was the prevalence of GAD in this population, the burden associated with it, and common comorbidities associated with GAD. This thesis focuses the older adult age range of 65 and over.

Alcohol Definitions

In this thesis, past 12 month alcohol use was measured by frequency and quantity. The categories of alcohol consumption were: abstinence, which refers to not drinking over this time period; moderate drinking, which is drinking below the recommended weekly amounts (17 standard drinks for men and 11 standard drinks for women) (Health Service Executive, 2018); at-risk drinking is the recognised term for drinking beyond these recommendations. Harmful drinking refers to drinking over 40 standard drinks for men and 28 standard drinks for women per week (Drummond et al, 2011). A standard drink contains 10 grams of pure alcohol (Health Service Executive, 2018). Aside from the category of harmful drinking, these recommended guidelines are based on the UK's guidelines which were set out in a report by the Royal College of Physicians (Royal College of Physicians, 1987). While the Irish guidelines, which are used in this thesis, have not differed since, the UK's guidelines have recently been lowered (Department of Health, 2016). The benefit of using an alcohol consumption measure, as opposed to measuring for problem drinking or alcohol use disorder, is that it may be more useful in identifying thresholds of risk and harm. It is also less likely to capture aspects of mental health problems as it does not measure for psychological aspects of alcohol consumption. The standard quantity frequency measure is well suited for this purpose. A possible limitation is the potential for under-reporting alcohol consumption (Stockwell et al, 2004).

As a variety of measures are used in the literature to measure different aspects of alcohol consumption, these will be detailed briefly so as to outline their differences. With accuracy in mind, the construct measured by these tools was identified per study in the literature cited in this thesis. Some studies have used the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al, 2001) which includes questions on quantity and frequency of consumption, and questions on the consequences and symptoms of alcohol related harm or dependency. Other studies used the shorter version, AUDIT C which asks three questions which can give an indication of at risk drinking (Bush et al, 1998). These have been found to be accurate in detecting adults aged 65+ who drink 28 standard drinks for men and 17 standard drinks for women (Gómez et al, 2006). These quantities are slightly lower than the threshold for harmful drinking (Drummond et al, 2011). Nonetheless, the AUDIT has a high level of agreement with Quantity-Frequency questions (Reid et al, 2003) which are used in this thesis. The CAGE questionnaire (Ewing, 1984) is another commonly used measure. The name is an acronym of Cut down, Annoyed, Guilty, and Eye-opener. These are taken from the four questions within the questionnaire, which is a brief screening tool for the presence of alcohol use disorders (O'Brien, 2008). It has less concordance with Quantity-Frequency questions than the AUDIT (Reid et al, 2003), with one study finding the CAGE identified only 40% of adults aged 60+ who drank more than 21 drinks per week (Adams, Barry, & Fleming, 1996).

Up until 2013, the American Psychiatric Association's Diagnostic and Statistical Manual (DSM) IV divided alcohol problems into two alcohol use disorders (AUDs): abuse and dependence (American Psychiatric Association

2000). In 2013, abuse and dependence were combined into the one AUD, with mild, moderate and severe classifications (American Psychiatric Association, 2013). . In terms of quantity of consumption, harmful drinking is more or less the equivalent of alcohol abuse (DSM IV) (American Psychiatric Association 2000) (Drummond et al, 2011), or mild to moderate AUD. Rehm and colleagues (2013) suggest that measuring for increasing quantity of alcohol consumption over time might provide a less culturally bound diagnostic criterion for alcohol problems than the DSM IV (American Psychiatric Association, 2000) symptoms for an alcohol use disorder. Measuring quantity of consumption is particularly relevant in Ireland where harmful drinking is the norm (Long & Mongan, 2014), and which has the fourth highest rate of consumption out of 36 countries in the Organisation for Economic Co-operation and Development (OECD) (Organisation for Economic Co-operation and Development, 2013).

At-risk, and Harmful Drinking in Older Adults

Within the past few decades the subject of alcohol use, and more significantly, at-risk and harmful drinking among the older population, has garnered increasing attention. In terms of physical health, findings in the literature suggest the existence of a U-shaped curve, where moderate drinking predicts lower mortality than abstinence (Ferreira, & Weems, 2008), while at-risk and, more specifically, harmful drinking, can have significant and detrimental effects on physical health. As this chapter explored in further detail, these effects might extend to mental health.

Rates of alcohol problems among older adults are consistently higher than diagnoses for same. An example of this can be seen in the findings from

the first wave of the TILDA study (Barrett, et al, 2011). Among Irish adults aged 65 to 74, 3.7% showed signs of alcohol problems via the CAGE questionnaire. The study's participants were also asked if they had ever been diagnosed with either alcohol or substance abuse. The prevalence of scores on the CAGE questionnaire—indicating the presence of an alcohol problem—were almost double that of participants who reported having been diagnosed with alcohol or substance abuse. This suggests either one of two possibilities: that these older adults would prefer not to admit their diagnoses due to the social stigma attached to having alcohol problems (Fortney et al, 2004), or that they have not been diagnosed.

In the 65 and over population in Ireland,, self-reported alcohol consumption increased from 54% in 1998 to 62% in 2002, and increased again to 73% in 2007 (Morgan et al, 2009). From the same survey, at-risk drinking increased slightly from 1998 (4%) to 2002 (5%), but there was an overall decrease in this form of drinking by 2007 (3%). However, from 2007 to 2011, there was an increase in alcohol problems among older adults living in Ireland. In TILDA, rates of alcohol problems (CAGE) in the 65-74 age group increased from 8.3% in 2011 to 12.5% in 2013, while rates for those aged 75+ increased from 4% to 8% (Donoghue et al, 2014). The co-occurrence of mental health issues and alcohol use has been under-investigated in comparison to other age groups, and has remained a low priority for service providers (Rakshi, Wilson, & Burrow (2011).

Based on Morgan and colleague's (2007) finding, the National Council for Ageing and Older People (National Council on Ageing and Older People, 2008) recommended that harmful drinking should be a priority in the

implementation of the National Alcohol Policy. Yet, until 2017, Irish policy had followed international trends (World Health Organisation, 2010; Hope, 2008; Health Service Executive, 2011) in attending to the issue of early adult alcohol problems, while being mostly inattentive to the issue in older adults.

The most recent national strategy in Ireland for addressing substance use related harm was titled "Reducing Harm, Supporting Recovery – a health led response to drug and alcohol use in Ireland 2017-2025" (Ireland. Department of Health, 2017). One of the further objectives in this strategy is the need to improve the response to the needs of people with co-morbid severe mental illness and substance misuse problems. However, it remains to be seen whether this addresses the more complex needs of this co-occurrence within the older adult population.

Generalised Anxiety Disorder

The diagnostic category of Generalised Anxiety Disorder (GAD) is relatively new, having been defined as recently as 1980 in the DSM III (American Psychiatric Association, 1980). In this first formal appearance, the core symptom was generalised persistent anxiety. This was changed in the revised DSM III-R, when the core symptom became that of persistent worry (American Psychiatric Association, 1987). Anxiety was reintroduced as a core symptom alongside worry in the DSM IV (American Psychiatric Association, 2000). The two have remained as core symptoms in the current DSM V (American Psychiatric Association, 2013). Due to its high rates of comorbidity (Bruce et al, 2001), the validity of GAD has not enjoyed the acceptance of more established anxiety disorders (Weisburg, 2009), with some authors believing it to be an early symptom of some other mood, or anxiety disorder

(Kessler et al, 2002). While GAD is often comorbid with other forms of anxiety, it is most frequently comorbid with threshold depression (Simon, 2009), to the extent that some have wondered if it should be remain a disorder separate to depression in older adults (Flint, 2009), or be reclassified, alongside depression, as a stress based disorder (Slade & Watson, 2006). Therefore, while it would appear that GAD and unspecified anxiety are one and the same, as in the initial DSM III criteria, they are separate constructs, with the predominant symptom of GAD being worry, rather than anxiety (van der Heiden et al, 2010). As such, the focus of this review will be on research which has measured for GAD rather than unspecified anxiety.

According to the Diagnostic and Statistical Manual V (DSM V), GAD is diagnosed when an individual displays its core symptoms, excessive anxiety and worry, and when they find it difficult to control these. In addition, this must be associated with three or more secondary symptoms. There are 6 possible secondary symptoms: restlessness, or feeling keyed up or on edge, fatigue, difficulty concentrating or mind going blank, irritability, muscle tension, sleep disturbance. Additionally, the focus of the individual's anxiety and worry must not be confined to that of any other anxiety disorder (American Psychiatric Association, 2013).

Prevalence of GAD in older adults. The global prevalence for GAD in the general adult population is 7.3% (Stein et al, 2017), with a higher rate among primary care patients (8.3%) (Ansseau et al, 2005). In adults aged 65 and over the prevalence of GAD ranges from 2.5% to 11.5% (Beekman et al, 1998; Mackenzie et al, 2011; Canuto et al, 2018). Rates differ slightly by age groups within the older population. The older adult age group with the highest

percentage of GAD across five European countries and Israel was the 65-74 age group (3.9%), then those aged 75-79 (2.6%), with the lowest rate in those aged 80 and over (2%) (Canuto et al, 2018). Unlike other anxiety disorders, which are more common in younger age groups, GAD is prevalent among older adults (Lieb, Becker, & Altamura, 2005), specifically those aged 65-74 (Canuto et al, 2018).

In the Irish population, 13% of Irish adults aged 55 and over reported to have clinically significant symptoms of anxiety (Barrett et al, 2011). When asked if they had been diagnosed with an anxiety disorder, 85% of those respondents who presented with clinically significant symptoms of anxiety in the TILDA study said they had not received a diagnosis (Barrett et al, 2011). This level of under-diagnosis is higher than that found in an American sample where 18% of those with GAD reported not having been diagnosed (Mackenzie et al, 2011). These figures suggest that a large number of older Irish adults are living with undiagnosed anxiety, either unspecified or GAD, which means that, as seen in rates of alcohol problems, these participants are either not disclosing their diagnoses, or have not yet been diagnosed, and so are not receiving targeted treatment. Neither is a favourable outcome.

Burden associated with GAD. GAD is highly debilitating (Mackenzie et al, 2011). It poses a similar, if not larger, degree of burden than that found in depression (Lieb, Becker, & Altumura, 2005), with high ratings of impairment on the Sheehan disability scale (Sheehan, 1983) similar to that found in depression. In general adult populations, primary care attenders show a higher prevalence than adults in population representative samples (Üstün & Sartorious, 1995). Adults aged 60 and over with GAD have worse health

related quality of life, and greater healthcare use than those without GAD (Porensky et al, 2009). Primary health care costs for GAD patients are more than double that of primary care patients without GAD (Rovira, et al, 2012).

Despite this high prevalence among primary care patients and the high health care costs associated with it, many patients with GAD are not recognised as having it by their primary care attenders and so few receive treatment (Lieb et al, 2005). This under-diagnosis might be partly due to its frequent physical comorbidity with chronic pain, somatisation (Nutt et al, 2006) and somatic diseases (Parmentier, Garcia-Campayo, & Prieto, 2013). It also has a high rate of psychiatric comorbidity (Nutt et al, 2006; Wolitzky-Taylor et al, 2010), to the extent that it is often misdiagnosed as depression (Calleo et al, 2009). Health practitioners might also assume that worry is normal in older adults and so miss the presence of this disorder (Bodner, Palgi, & Wyman, 2018).

General Adult Population Association Between GAD and Alcohol

There has been little to no research conducted on the association between GAD and at-risk or harmful drinking within an older population (table. 2). A systematic search was conducted using the key terms “older adults” “generalised anxiety disorder” “alcohol consumption” “and synonyms for each of these in Google Scholar, ProQuest, PsychARTICLES, PsychoINFO and PubMed. These terms were searched every six months so as not to exclude the most up to date literature. The results of these literature searches suggest that the majority of the research on the association between GAD and any alcohol use measure has been conducted in general adult populations. The original number of articles identified as being possibly relevant were not

recorded, nor were the exact screening procedures, however when I had read through the originally identified articles for relevancy, I discovered 18 relevant studies which examined the association between any form of anxiety and a measure of alcohol in any adult age group, 10 of which measured specifically for GAD (Burns & Teesson, 2002; Grant et al, 2004; Grant et al, 2009; Robinson et al, 2009; Alegria et al, 2010; Mackenzie et al, 2011; Marmorstein, 2012; Bellos et al, 2013; Ivan et al, 2014; Carvalho et al, 2018). Out of these four measured for GAD and were conducted in an older adult population (Robinson et al, 2009; Mackenzie et al, 2011; Ivan et al, 2014; Carvalho et al, 2018). A further eight studies measured for unspecified anxiety in older adults (Mehta et al, 2003; Hajat et al, 2004; Cohen et al, 2006; Sacco et al, 2009; Lin et al, 2014; Vaughan et al, 2014; Van Den Berg et al, 2014; Marti et al, 2015).

Findings within the general adult population suggest an association between GAD and any AUD exists (Grant et al, 2005), but not when the presence of other psychiatric disorders are controlled for (Grant et al, 2009). This lack of significance however, was not replicated in an Australian population where having GAD was associated with any AUD (Burns and Teesson, 2002), or in other studies where, despite controlling for psychiatric disorders, having any AUD was a significant predictor, with a stronger association for alcohol dependence than abuse (Burns and Teesson, 2002; Alegria et al, 2010; Marmorstein, 2012). While the majority of studies identified in the general adult population use an AUD as the alcohol measure, one used AUDIT scores, reporting a trend where increasing scores almost reached significance as being predictive of having GAD in adults aged 18-64 (Bellos et al, 2013). The latter study was one of the few in this area of the

research to have controlled for health related factors (chronic health conditions and disability), which, considering GAD's relationship with primary health care attendance (Rovira et al, 2012), suggests that these need to be controlled when assessing this association.

While this appears to suggest that alcohol problems (as measured by AUDIT) may not be associated with having GAD when physical health confounders are controlled for, the adjusted analysis in Bellos and colleagues' (2013) study showed a slight increase in strength compared to bivariate analysis, suggesting that a weak association exists in a younger population.

Table 1.
Associations between GAD and alcohol in the general population

Authors and year	Age	Sample	Alcohol measure	Anxiety measure	Design (Cross-sectional)	Association between GAD and alcohol
Alegria et al, 2010.	18+	N= 43,093. NESARC. US.	AUDASIS DSM IV (12 month alcohol abuse/dependence)	AUDASIS DSM IV (12 month GAD).	Logistic regression.	Of those with GAD and an SUD, 38% had alcohol abuse, while 54% had alcohol dependence.
Bellos et al, 2013	18-64	N=25,916. WHO study in 14 countries.	AUDIT	CIDI for GAD	Multilevel modelling.	At-risk drinking associated with slightly increased GAD but not significant 1.6 (1.1-2.3)
Burns & Teesson, 2002	18+	N= 10,641. Australian National Survey of Mental Health and Well Being.	CIDI DSM IV (lifetime AUD)	CIDI (lifetime GAD)	Multivariate Logistic Regression.	Odds ratio for association between AUDs and GAD 3.3 (1.9-5.6)
Grant et al, 2005	18+	N= 43,093. NESARC wave 1. US	AUDASIS DSM IV (12 month AUD)	AUDASIS DSM IV (12 month GAD).	Multivariate Logistic Regression.	Odds ratio of any AUD comorbid with GAD 1.9 (1.5-2.5).
Grant et al, 2009	18+	N= 34,653. NESARC wave 2. US.	AUDASIS DSM IV (12 month alcohol abuse/dependence)	AUDASIS DSM IV (12 month GAD)	Multiple regression analysis.	No significance between GAD and any AUD.
Marmorstein, 2012	18+	National Comorbidity Survey-Replication n=9,282. US.	CIDI DSM IV (lifetime abuse/dependence)	CIDI DSM IV (lifetime GAD)	Logistic regression.	Alcohol dependence associated with GAD 2.76 (2.09-3.41). Alcohol abuse associated with GAD 3.39 (2.47-4.65).

CIDI= Composite International Diagnostic Interview Depression. DSM IV= Diagnostic and Statistical Manual IV diagnosis. GAD=generalised anxiety disorder. SUD=substance use disorder. AUDASIS= The Alcohol Use Disorder and Associated Disabilities Interview Schedule.

Older Adult Population Association Between GAD and Alcohol

Despite the high prevalence of GAD and co-occurring AUDs in the general population, there has been little to no research done to identify just how prevalent co-occurring GAD and at-risk or harmful drinking or other measures for alcohol problems might be among older adults. As Vaughan, Robbins, & Escobar (2014) note, there is a paucity of research on the mental health of adults aged 50 and over and their alcohol consumption. The literature that could be identified on the co-occurrence between GAD and alcohol in older adults (Robinson et al, 2009; Mackenzie et al, 2011; Ivan et al, 2014; Carvalho et al, 2018) provides further evidence of this.

From the literature search, and as reported by Wu and Blazer (2013), I was unable to identify any studies on categories of alcohol use including at-risk or harmful drinking and their association with GAD in older adults, whether aged 50 and over, 60 and over, or whether they were in this thesis' target age group of 65 and over, while writing this thesis. This remained the case until late 2018 when Carvalho and colleagues (2018) published their analysis of this association using the same data set as this thesis. This further emphasizes the need to research this topic. There were important differences between this study and the analysis in this thesis. The Carvalho et al (2018) study was longitudinal, analysing the data from the 1st to the 2nd dataset in TILDA wheras the quantitative wave of this study was cross-sectional, analysing the 2nd dataset. The 2018 study was conducted in the 50 and over age group, whereas this study focuses on the 65 and over age group. As the longitudinal analysis was restricted to participants in wave 1 who had returned the self-completion questionnaire (which includes questions on ore sensitive topics such as alcohol

consumption), it may not include those participants who returned this questionnaire in wave 2 but not wave 1. This means that the Carvalho et al (2018) study may not include all participants who completed the alcohol questions, whereas this thesis does.

A significant difference was that this latter study did not differentiate between at-risk drinking, and harmful drinking. Further, while chronic health conditions were controlled for in the analysis, in addition to socio-demographic factors, no other possible physical health related factors such as disability, functional limitations, self-rated health, smoking, or psychological variables such as loneliness, personality traits, or quality of life were included. In addition to measuring for at-risk drinking, the latter study also used the CAGE measure, which in TILDA is asked after the quantity frequency questions on alcohol consumption. This order of questioning has been found to result in less positive CAGE scores in men (Etter, 2004), resulting in a possible under-estimation of alcohol problems in men. This might explain why problem drinking (CAGE) was predictive of GAD in women but not men (Carvalho et al, 2018).

Of those studies conducted on GAD in older adults, at-risk drinking was not associated with having GAD (Ivan et al, 2014; Carvalho et al, 2018). In fact, moderate and at-risk drinking have been found to be predictive of reduced GAD scores, albeit without reaching significance (Ivan et al, 2014). This latter finding is limited, firstly because the association did not reach significance, and secondly because those with an AUD were excluded from the analysis, meaning a possibly significant portion of harmful drinkers, and possibly at-risk drinkers, were excluded.

As no further studies analysing the GAD and alcohol association in the older population were identified, seven studies which examined the association between unspecified anxiety and alcohol problems or at-risk drinking were reviewed (Mehta et al, 2003; Hajat et al, 2004; Cohen et al, 2006; Sacco et al, 2009; Vaughan et al, 2014; van den Berg et al, 2014; Marti et al, 2015). As previously discussed, unspecified anxiety is not wholly representative of GAD. This is significant because different anxiety disorders have different associations with, for example, alcohol dependence and abuse, in a general adult population (Falk et al, 2008). This is likely the case for an older population too. This further demonstrates that the association between GAD and at-risk and harmful drinking in older adults is a gap in the literature. However, as GAD is likely to be present in unspecified anxiety, and as there are so few studies on GAD in the older population, those studies that measured for anxiety with alcohol in the older adult population were reviewed to identify whether any trends were similar to those in the GAD and alcohol association.

Table 2.
Association between GAD or unspecified anxiety and alcohol in older adults

Author and year	Age	Sample	Alcohol measure	Anxiety measure	Design	Association between GAD and alcohol
Carvalho et al, 2018	50+	N= 6095. The Irish Longitudinal Study of Ageing.	CAGE. Quantity Frequency Questionnaire. (Abstinent, moderate, heavy drinker)	Hospital Anxiety and Depression Scale	Longitudinal. Logistic regression.	In multivariate cross sectional analysis problem drinking predicted anxiety in women 2.22 (1.01,4.86), but not men.
Cohen et al, 2006	55+	N=1074. Participants living in Brooklyn, New York.	Asked about present or past alcohol abuse.	Anxiety Status Inventory Scale	Cross-sectional. Regression.	Anxiety associated with present or past alcohol abuse. 14(.02–.80).
Hajat et al, 2004	75+	N=53. Patients from Medical Research Council General Practice Research Framework. UK.	Lifetime abstinent, ex drinkers, moderate drinkers, at-risk drinkers.	Self-reported anxiety.	Cross- sectional. Logistic regression.	At-risk drinkers not included in model. Moderate drinking associated with increasing anxiety 1.31 (1.07, 1.61).
Ivan et al, 2014	60+	N=223. Primary care patients. US	Moderate and at-risk drinking. Excluded those with alcohol abuse.	GAD Severity Scale. Abbreviated Penn State Worry Questionnaire	Cross-sectional. Logistic regression.	Alcohol use associated with reduced GAD scores but not significant.
Lin et al, 2014	65+	N=8205. NESARC. 2001-2002 (Wave 1)..	AUDASIS DSM IV Alcohol use disorder	AUDASIS DSM IV(Aggregate of Lifetime panic, specific phobia, social phobia, and GAD)	Cross- sectional. Logistic regression.	Any lifetime anxiety disorder significantly associated with having a lifetime alcohol use disorder 1.51 (1.16–1.97).

Table 2. *(*continued*)*

Marti et al, 2015.	65+	N=11,191. National Survey on Drug Use and Health. US.	Lifetime abstainers, ex drinkers, binge drinkers and non-binge drinkers.	Lifetime and past year DSM-IV anxiety disorders..	Cross- sectional. Logistic regression.	Lifetime abstention decreased odds of lifetime anxiety by almost half 0.39 (0.23-0.68). Binge drinking not associated with anxiety.
Mackenzie et al, 2011	55+	N=12312. NESARC 2004-2005 (Wave 2).	"In last year, did you drink to calm down or help quiet your nerves when you felt tense, nervous or worried?"	AUDASIS IV GAD	Cross-sectional. Logistic regression.	Participants with GAD self-medicate with alcohol 80.23 (18.26-352.46).
Mehta et al, 2003	70-79	N=3,041. Healthy Ageing and Body Composition Cohort. US.	3+ drinks per week.	Anxiety symptoms from Hopkins Symptom Checklist.	Cross-sectional. Logistic regression.	Drinking more than three drinks per week not associated with anxiety symptoms.
Robinson et al, 2009	18+	N= 43,093. NESARC. 2001-2002 (Wave 1). US.	AUDASIS DSM IV (alcohol use disorders).	AUDASIS DSM IV GAD	Cross- sectional. Multiple logistic regression.	7.7.% of those aged 65+, who had anxiety self-medicated with alcohol. The association was not significant.
Sacco et al, 2009	60+	N=4,646. NESARC 2001-2002 (Wave 1).	Low risk, moderate risk, and high risk categories derived from Latent Class analysis.	DSM IV Panic disorder with/without agoraphobia or GAD	Cross-sectional. Multinomial logistic regression.	Panic disorder with/without agoraphobia or GAD not associated with low risk, moderate or high risk drinking.
Vaughan et al, 2014	50+	N=2,142 American Hispanic people. NESARC, Wave 2. US.	DSM-IV lifetime AUD. Binge drinking/ regular drinking.	DSM IV (unspecified lifetime anxiety)	Cross-sectional. Logistic regression.	Lifetime anxiety disorder increased odds of binge drinking 2.34 (1.99, 2.75) and lifetime AUD 1.88 (1.55, 2.27).
Van den Berg et al, 2014	60+	N= 373. Netherlands Study of Depression in Older Persons	AUDIT	Beck Anxiety Inventory	Cross-sectional. Logistic regression.	Having anxiety was not associated with any alcohol use.

CIDI= Composite International Diagnostic Interview Depression. DSM IV= Diagnostic and Statistical Manual IV diagnosis. GAD=generalised anxiety disorder. SUD=substance use disorder. AUDASIS= The Alcohol Use Disorder and Associated Disabilities Interview Schedule. AUDIT= Alcohol Use Disorders Identification Test. NESARC= National Epidemiologic Survey on Alcohol and Related Conditions

Among older adults, having any lifetime anxiety disorder is associated with having an AUD (Lin et al, 2014; Vaughan et al, 2014). More pertinently, having current anxiety was associated with self-reported alcohol abuse (Cohen et al, 2006), but not with drinking 3+ drinks per week (Mehta et al, 2003), at-risk drinking (Sacco et al, 2009), binge drinking (Marti et al, 2015), or low-risk drinking (AUDIT) (Van Den Berg et al, 2014). Van den Berg and colleagues (2014) controlled for the health related factors of functional limitation, and smoking (which were significant predictors). The inclusion of these factors, in addition to others (such as social support) likely reduced the strength of the GAD and alcohol association.

One study in this area did not include at-risk drinkers in their multivariate analysis for methodological reasons, but nonetheless found moderate consumption to be associated with higher levels of GAD (Hajat et al, 2004). This may be because those aged 75 and over are, as in Hajat and colleagues' (2004) study, less likely to have alcohol problems than those aged 65-74 (Barrett et al, 2012), and more likely to have a lower prevalence of GAD (Canuto et al, 2018). The older age group could also be more biologically vulnerable to alcohol's effects (Hallgren, Högberg & Andréasson, 2009). Interestingly, any level of alcohol use has been found to be predictive of GAD in those aged 70-79 in bivariate analysis, but this lost significance in multivariate analysis (Mehta et al, 2003). Significant multivariate predictors in the latter study were urinary incontinence, hearing problems, hypertension, poor sleep, need for emotional support, recent negative life events, low personal mastery, or negative view on meaning of life. It is difficult to know which of these might have reduced the association, but 3+ drinks per week is a

low threshold of alcohol consumption for any age.

This small grouping of studies from both populations on GAD and on unspecified anxiety, suggests that GAD and AUDs frequently co-occur in the general adult population. Controlling for health related factors may reduce the association between anxiety and at-risk drinking in an older population (Van Den Berg et al, 2014). No research could be identified that examined whether harmful drinking was predictive of having GAD in later life.

Regarding the association of abstention from alcohol and having GAD in the older adult population, until recently this was not studied in the research literature. Carvalho et al (2018) measured for abstinence and found no associations with GAD in those aged 55 and over. As no other studies which include a measure for abstinence and GAD were identified, it is useful to note two further studies on anxiety that is not specifically GAD. Among adults aged 65 and over, lifetime abstention from alcohol decreased the odds of having a self-reported anxiety disorder by almost half (Marti et al, 2015). While in adults aged 75 and over there was no association between abstinence and anxiety (Hajat et al, 2004). Abstinence was included in the current study's analyses.

The Use of Alcohol to Self-Medicate Anxiety by Older Adults

In a general adult population, GAD had a the higher rate of self-medicating with alcohol (35.6%) than any other anxiety disorder (Bolton et al, 2006). GAD remains the anxiety disorder most likely to be self-medicated with alcohol in older adults, with prevalence rates ranging from 18% to 7% (Robinson et al, 2009; Mackenzie et al, 2011). This behaviour in adults with GAD is associated with developing a comorbid mood disorder, increased distress, suicidal ideation and attempts, and the development of substance use disorder (Bolton et al, 2006). Among the 65 and over age group, those who drink to self-medicate anxiety consume alcohol at slightly higher levels than those who drink for social reasons (Immonen et al, 2011a).

That self-medicating GAD is a risk factor for substance use disorder (Bolton et al, 2006), and associated with higher levels of alcohol consumption than the norm (Immonen et al, 2011a) is concerning when the high rates of under-diagnosis of GAD, and alcohol problems, in the 50 and over population in Ireland (Barrett et al, 2011) are taken into account. Additionally, older adults might not be aware of, or be able to communicate, their GAD. Adults aged 55 and over who have not had a professional diagnosis of GAD will often present to their healthcare provider with somatic complaints rather than using terms generally associated with GAD (Wittchen & Hoyer, 2001). Bolton and colleagues (2006) suggest that the high rate of self-medication is due to the all pervasive worry associated with GAD. The individual cannot focus on anyone triggering event or phobia, and so is more likely to use alcohol than any more targeted intervention to cope with this worry. These factors taken together suggest that older adults with GAD may be at risk of self-medicating with

alcohol, thus increasing their alcohol consumption, which will have a further negative effect on their mental health.

Summary

Studies conducted within general adult populations report significant associations between GAD and AUDs. Controlling for poor physical health could reduce the association of anxiety, and thus GAD, with drinking in the older population. The analysis of whether harmful drinking is predictive of GAD is a gap in the literature.

Additionally, moderate alcohol use might have a protective effect against having GAD in general populations and this could be the case for older populations, too. There is a dearth of studies on the categories of alcohol consumption and how these might be related to GAD in older adults, particularly in regard to harmful drinking, but also in relation to abstinence. Further, there is evidence that older adults use alcohol to medicate their GAD. This thesis aims to discover the association between GAD and alcohol consumption, and the factors that might account for this association in the older population.

Chapter Three: Literature Review on Depression and Alcohol

The following chapter examined the prevalence of depression among older adults, its differing diagnostic profile in this population compared to that in younger adults, and symptoms and factors related to depression. Unlike the literature on GAD and alcohol, there is a larger body of research on depression and alcohol use in this population. This was reviewed, first with an emphasis on the associations that depression has with differing measures for alcohol, with the finding that only one study has assessed harmful drinking as a predictor for depression, but did not control for many health related factors. The literature was then assessed for whether there is a difference between being aged 50 and over, 65 and over, or 75 and over in this association. Furthermore, a trend was discovered wherein those studies which controlled for self-rated health were more likely to report a significant association between depression and any alcohol use variable than those that did not.

Depression

Prevalence of depression in older adults. The prevalence of current threshold depression in community dwelling older adults in the Irish population is similar to that found internationally. Among Irish adults aged 65 and over, 9% have symptoms of threshold depression (Barrett, et al, 2011). Internationally, a rate of 9.8% has been recorded in in an American sample (Hybels, Blazer, & Pieper, 2000), 8% across seven European countries (Andreas et al, 2017), 9.1-10.6% in a Swedish sample (Sjöberg et al, 2017), and 8.7% in an English sample (McDougall et al, 2007).

It is generally believed that older adults, while appearing to be at a high

risk of threshold depression due to physical health factors, tend to have lower rates than those of a younger age (Blazer & Hybels, 2005). While findings support this (Kessler et al, 1994; Byers et al, 2010), with rates peaking between the ages of 20 and 64 (Ferrari et al, 2013), this however does not necessarily mean that depression symptoms decrease over the lifespan. A six year longitudinal twin study, for example, showed an increase of symptoms from the age of 60 onwards (Fiske, Gatz, and Pedersen, 2003). Prevalence rates might only decrease by a couple of percentages, and even then it may be only a temporary decrease. A meta-analysis reported a rate of 7.2% in the older old age group of 75+, (Luppa et al, 2012), suggesting that rates of threshold depression tend to slightly decline by this age. This trend appears to reverse by the age of 85 (Byers et al, 2010).

While threshold depression tends to decrease until the age of about 85, subthreshold depression is known to increase with age. Subthreshold depression is present with a person experiences clinically relevant depressive symptoms which do not meet the criteria for threshold depression (Zimmerman et al, 2013). A review of the literature showed that on average, the prevalence of subthreshold depression in community dwelling older adults ranged from 9.9% to 21% (Hybels et al, 2000; Barrett, et al, 2011; Meeks et al, 2011). The Irish subthreshold rates are 16% for those aged 65-74, and 21% in those aged 75+ (Barrett, et al, 2011). The rate for Irish adults is high, particularly in the older-old age group. While the rate of adults aged 75 and over likely reflects the increasing prevalence of subthreshold depression with age (Meeks et al, 2011), rates of depression in Ireland are particularly high. A comparison of depression rates across general adult populations suggests that urban areas in

Ireland and the UK have some of the highest rates of depression in Europe (Ayuso-Mateos et al, 2001). This could explain the high rate of subthreshold depression in older Irish adults.

Differing diagnostic profile to younger adults. Some investigators regard late life threshold depression to be a different form of depression to that experienced earlier in life (Blazer, 2003), with adults in later life being less likely to present with affective symptoms of depression such as sadness, crying, and feeling fearful (Gallo, Anthony, & Muthen, 1994; Hybels, Landerman, & Blazer, 2012). Somatic complaints such as poor appetite, loss of interest in sex (Hybels et al, 2012), hypochondriasis, and psychomotor retardation (Rodda, Walker, & Carter, 2011) are more common in those aged 65 and over. In addition, this age group are more likely to have psychosis, agitation (Rodda et al, 2011), and cognitive impairment than younger adults (Hybels et al, 2012).

Subthreshold depression in older adults is receiving increasing attention in the research literature, as it has been particularly understudied in the older population ranging from 55 and over (Meeks et al, 2011). Its symptoms are similar to those found in threshold depression, differing mostly in terms of their severity (Gotlib, Lewinsohn, & Seeley, 1995; Chen et al, 2000) and, like threshold depression in this population, there is less psychological distress as measured by the General Health Questionnaire (Goldberg & Hillier, 1979) (Chopra et al, 2005). Nonetheless, subthreshold depression exerts a significant burden on older adult health (Chachamovich et al, 2007; Grabovich et al, 2010), and is associated with functional limitation, to an extent comparable to that found in adults aged 65 and over with threshold depression (Lyness et al,

2009). It is also less likely to be detected among adults aged 55 and over in primary care (Licht-Strunk et al, 2009). Additionally subthreshold depression can be a precursor to threshold depression (Meeks et al, 2011).

The differing presentation of threshold depression in older adults may be the cause of its under-diagnosis in this age group (Allan, Valkanova, & Ebmeier, 2014). In the Irish population, only 22% of those who scored as having threshold depression reported having been diagnosed (Barrett et al, 2011). Another possibility for this low rate of diagnosis could be the perceived stigma associated with mental illness in the older population; adults aged 65 and over with depression are less likely to seek mental health treatment than their younger counterparts (Conner et al, 2010). Perceived stigma can result in adults aged 65 and over being in denial of their depression (Sirey et al, 2001). This could partially explain the high rate of under-diagnosis, as Irish society has a high rate of perceived stigma against depression (St Patrick's Hospital, 2017). This stigma may be even greater in the older age group (Conner et al, 2010).

Apart from stigma, ageism, whether benevolent or not, might add to this low rate of diagnosis. There is a general tendency in society, which can also be found among health practitioners, to treat depression as an inevitable part of the ageing process where the older the individual is the more likely they are thought to have depression (Sorocco & Ferrell, 2006). This attitude can be found among older adults themselves, particularly in the oldest old age group (Law, Laidlaw & Peck, 2010).

Compounding this difficulty is a perception among older adults (60 and over) that depression is not a legitimate illness, and the perceptions of primary

care practitioners that depression is to be expected (Burroughs et al, 2006). Additionally, when older adults (65 and over) are diagnosed with depression, primary care practitioners may be less likely to offer psychological treatments instead attempting to treat through the medical model (McCrae et al, 2004), resulting in less uptake of treatment (Gum et al, 2006).

Symptoms and factors associated with depression in older adults. As Burroughs and colleagues (2006) note, physical comorbidity and presentation of somatic symptoms in older adults with depression are another barrier to diagnosis. Older adults have a markedly different physical health profile to younger adults and this appears to be strongly related to their experience of depression. Almost two thirds of older Irish adults who have a diagnosis of depression have a longstanding illness or disability. The presence of threshold depression is associated with almost double the number of visits to a general practitioner compared to those without depression, and almost two additional prescribed medications (Barrett et al, 2011). Depression has a negative effect on physical health to the extent that it is predictive of mortality (Schulz et al, 2010), more so than myocardial infarction, or diabetes (Gallo et al, 2005). The lowered motivation found in depression may be the underlying mechanism of this increased mortality.

Common physical health comorbidities are diabetes, myocardial infarction, hip fracture, and having had a stroke (Blazer, 2003). Just as depression has a negative impact on physical health, poor physical health exerts a negative impact on depression (Blazer, 2003). Additionally, poor self-rated physical health is associated with depression in this population (Han, 2001; Alpass & Neville, 2010). Regarding its relationship with cognitive

health, in those with dementia, the presence of depression has been found to increase the rate of cognitive decline, exerting an effect stronger than that found for either gender or level of education (Rapp et al, 2011).

Aside from physical health, known socio-demographic predictors of threshold depression are being a woman (Gum et al, 2009; Barrett et al, 2011), having a low socioeconomic status, a lower level of education (Chang-Quan et al, 2010), not having a partner (Tait et al, 2012), bereavement (Fiske, Wetherell, & Gatz, 2009) and being retired (Coulton, 2009). Health related predictors are having a physical disability (King-Kallimanis, Gum, & Kohn, 2009; Barrett et al, 2011), physical impairment (Tait et al, 2012; Van den Berg, et al 2014), physical illness, and poor self-rated health (Han, 2001; Alpass & Neville, 2010), in addition to smoking (Sacco et al, 2009; van den Berg, 2014). Psychological predictors of depression in older adults (60 and over) are high neuroticism, low extroversion, and low conscientiousness (Koorevaar et al, 2013), and loneliness in those aged 55, and 66, and over (Cacioppo et al, 2006; Barg et al, 2006). Depressive symptoms are linearly associated with decreased quality of life ratings, and decreased positive attitudes toward ageing (Chachamovich et al, 2008).

Threshold depression is closely associated with suicide in this population, more so than in younger populations (Fiske, Wetherell, & Gatz, 2009). Among a sample of adults aged 65 and over with a diagnosis of depression, death ideation was present in 93.2% of the sample, while suicidal ideation was present in 91.5% (Bartels et al, 2002). A recent World Health Organisation (WHO) report notes that global suicide rates are highest among adults aged 70 and over (WHO, 2014).

As suicide appears to have a particularly strong association with depression in older adults (Fiske et al, 2009), the reduction of depressive symptoms may have a stronger role to play in reducing suicide rates among this population than in younger adults. Once diagnosed, adults aged 60 and over benefit from treatment for depression just as much as other age groups (Reynolds et al, 1996). Therefore, there is a need to improve diagnosis rates. This might reduce suicide rates and it will improve the quality of life of older adults. This might be done through the identification of markers for depression. It is possible that under-diagnosis is partly due to unexamined ageism in health practitioners (Burroughs et al, 2006), or older adults denying their depression because of perceived stigma against depression by older adults themselves (Law et al, 2010), and within society (Sorocco & Ferrell, 2006). It is likely that the differing presentation of older adult depression also plays a large role in this. Therefore, it is important to identify risk factors for depression in this population, such as alcohol consumption, and to gain a better understanding of the perspectives of health practitioners on the association of depression and alcohol in their older adult patients so as to assist in improving diagnosis rates.

Alcohol and Depression

Research on the association between depression and at-risk and harmful drinking (and/or alcohol problems) in the older population is inconclusive and has a relatively short history. A systematic search was conducted using the key terms “older adults” “depression” “alcohol consumption” “and synonyms for each of these in Google Scholar, ProQuest, PsychARTICLES, PsychoINFO and PubMed. This search was performed every six months so as not to exclude the most up to date literature. Twenty three studies were reviewed, fifteen of which found a significant association between having either past year or lifetime threshold depression and drinking beyond the recommended guidelines and/or having alcohol problems (Perreira & Sloan, 2002; Merrick et al, 2008; St John, Montgomery, & Tyas, 2008; Sacco et al, 2009; Rodriguez et al, 2010; Almeida et al, 2013; Van den Berg et al, 2014; Laborde-Lahoz et al, 2014; Vaughan et al, 2014; Coulson et al, 2014; Kim et al, 2015; Bosque-Prous et al, 2016; Hansen et al, 2016; Mowbray et al, 2017; Carvalho et al, 2018). These can be seen in table 3.

Nine studies found no significance in this association (Barry et al, 1998; Osborn et al, 2003; Koster et al, 2006; Hoeck & Van Hal, 2012; Peltzer & Phaswana-Mafuya, 2013; Weyerer et al, 2013; Marti et al, 2015; Iparraguirre et al, 2015; Bosque-Prous et al, 2016). These can be seen in table 4.

For many of these studies the focus was on risk factors for alcohol, with depression added to a list of independent variables. While not always the case, this can result in vague or unvalidated measures for depression (Merrick et al, 2008; Iparraguirre et al, 2015). With regard to alcohol, some studies measured for an AUD, others used the CAGE questionnaire (Ewing, 1984), AUDIT

(Babor et al, 2001) or the S-MAST (Pokorny et al, 1972). Other studies measured for at-risk drinking, and only one measured for harmful drinking (Iparraguire, et al, 2015). The findings using these various measures were reviewed to ascertain whether the use of different alcohol measures explain the mixed findings between table 3 and 4. Additionally, while the focus of this review, and thesis, was on the 65 and over age range, a number of studies included older adults aged slightly below this such as 50 and over, and some aged 75 and over only. These were reviewed in addition to those that included this thesis' target population, so as to determine whether increased age impacts the depression and alcohol association in older adults. Finally, the few findings on the association between subthreshold depression and alcohol were reviewed.

In general adult populations the alcohol measure used in a study can affect the depression and alcohol association. For example, binge drinking (5+ drinks per day) is slightly more predictive of depression than quantity of drinks per week (Graham et al, 2007), while being dependent on alcohol is more predictive than either at-risk, or binge, drinking (Bulloch et al, 2012). This may not be the case in the older population for the reason that older adults have an increased biologically susceptibility to the effects of alcohol, and are at increased risk of alcohol-medication interactions (Hallgren et al, 2009). This increased biological vulnerability, in addition to the strong relationship that exists between depression and physical health in this population (Blazer, 2003) means that quantity of consumption per week may be more related to depression in this age group than in younger adults.

Studies that measured for binge drinking or at-risk drinking did not find either to be predictive of current depression (Barry et al, 1998; Perreira & Sloan, 2002; Osborn et al, 2003; Peltzer & Phaswana-Mafuya, 2013; Weyerer et al, 2013; Marti et al, 2015; Carvalho et al, 2018). Of those that measured for 21+ drinks per week, one found significance in men (Coulson et al, 2014), while two found it was not predictive for either gender (Koster et al, 2006; Hoeck and Van Hal, 2012). Drinking 28+ drinks per week however, was predictive of current depression in two studies (Merrick et al, 2008; Almeida et al, 2013).

One of the more interesting findings was that the only study that could be identified as measuring for harmful drinking (28+/40+ per week) did not find this to be associated with current depression (Iparraguire et al, 2015). Harmful drinking was the dependent variable. A large range of variables was included in the multivariate model (age, smoking, physical activity, loneliness, caring responsibility, religion, employment, social detachment, cultural engagement, social network, diet, living location, pain, frailty, and cohabitation). It is interesting that while this large range was controlled, there were few measures of health related factors such as physical health conditions. This is pertinent as depression in older adults is closely related to physical health (Blazer, 2003; Blazer & Hybels, 2005). This could explain the lack of significance for harmful drinking and depression. As such, it would appear that increasing quantities of alcohol consumption are predictive of current depression in this population, however apart from Iparraguire and colleagues (2015), no studies have measured for harmful drinking in the older population. This is particularly pertinent in an Irish context due to the high levels of alcohol consumption

reported in the country (Mongan and Long 2016).

Whilst this thesis measured only for at-risk and harmful drinking, many of the studies on this topic have used variables such as the CAGE questionnaire, AUDIT, or S-MAST. It is interesting that, apart from two (Hoeck and Van Hal, 2012; Carvalho et al 2018), the majority of these found significance (Perreira & Sloan, 2002; St John et al, 2008; Sacco et al, 2009; Rodriguez et al 2010; van den Berg et al, 2014; Kim et al, 2015; Hansen et al, 2016; Mowbray et al, 2016; Carvalho et al, 2018). This suggests that scales that measure for alcohol problems by assessing the psychological effects of these problems (in addition to the frequency or quantity of alcohol consumption) may identify people who, if they are otherwise vulnerable to depression, have developed it by this stage of their drinking. As such, scales that assess for the psychological effects of alcohol problems may also identify aspects of depression. Measures for harmful drinking are not vulnerable to this possibility, and so may be stronger predictors for the development of depression than more psychologically complex scales.
However, as harmful drinking had not been studied as a predictor of depression in this population, this was not definite.

The results of Bosque-Prous and colleagues (2016) were particularly interesting. A score of 5 or more or 4 or more on the AUDIT-C (Bush et al, 1998), which is about the equivalent of at-risk drinking, was associated with current depression, but only in men aged 50-64. There was no significance for men aged 65 and over or women of any age. Since all other conditions remained the same in the study, this suggests that these differing age groups affect the depression and alcohol relationship; specifically, that increasing age

may weaken this relationship. The authors suggested that men aged 50-64 drink as a way of coping with stress, as men are most likely to drink to cope with stress (Nolen-Hoeksema, 2004), however older adults tend to use alcohol to cope to the same degree that middle-aged adults do (Moos et al, 2009). To assess whether differing age groups might explain the discrepancy between the depression and alcohol consumption findings, all 23 studies were reviewed with regard to age.

Table 3.
Significant findings between depression and any alcohol use measure in older adults

Author and year	Age	Sample	Dependent variable (depression or alcohol)	Independent variable (depression or alcohol)	Factors controlled for (significant predictors)	Analysis	Depression-alcohol findings
Almeida et al, 2013	65-83	N=4636. community dwelling males	15-item Geriatric Depression Scale	Less than 4 drinks/day. More than 4 drinks/day	(Age), education, marital status, (weight), chronic health conditions, (physical activity), (smoking), eating meat, eating fish.	Cross-sectional. Multivariate general linear model.	Drinking more than 4 drinks/day was associated with having threshold depression in males.
Bosque-Prous 2016	50+	N=65955. SHARE Project.	AUDIT-C. Abstainer, low risk, hazardous.	12 item EURO-D scale.	(Age), (migrant background), (education), (marital status), (smoking), (chronic conditions) (self-rated health).	Cross-sectional. Multilevel poisson regression.	Depression associated with hazardous drinking in men aged 50-64: 1.10 (1.02–1.19). Depression was a protective factor against hazardous drinking in men aged 65+: 0.88 (0.79–0.98).
Carvalho et al, 2018	50+	N=6095. TILDA	CES-D	CAGE. Abstinent, moderate, at-risk drinking.	(Age), gender, marital status, (education), employment, (chronic health conditions), anxiety	Cross-sectional. Logistic regression.	Problem drinking associated with current depression in females 2.11 (1.12-4.00), not males.
Coulson 2014	65+	N=514. Men from the Geelong Osteoporosis Study (GOS)	Non-drinkers. More than 2 drinks/day. More than 3 drinks/day.	Symptoms corresponding to DSM-IV-TR criteria for past year depression.	Medication use, smoking, physical activity, bmi, age, gender, socio-economic status.	Cross-sectional. Logistic regression.	Lifetime depression and past year depression were both associated with abstinence and drinking more than 3 drinks/day.

Table 3. (continued)

Hansen 2016	65+	N=96. Older adults in the community with self -neglect.	Geriatric Depression Scale	Score of 1 or more on CAGE.	(Self-rated health), (pain)	Cross-sectional. Logistic regression.	Depression was associated with alcohol problem.
Kim et al, 2015	60+	N=1819. community dwelling adults.	Korean Beck Depression Inventory	AUDIT	(Age), (gender), (marital status), (education), (smoking), (exercise) (General physical and mental well-being) (Short Form-12 (Version 1) Health Survey (SF-12)	Cross-sectional. Multiple logistic regression.	Increasing AUDIT scores were associated with increasing depressive symptoms. Moderate drinking protective against having depression.
Laborde-lahoz et al, 2014	55+	N=10409. National Epidemiologic Survey on Alcohol and Related Conditions.	AUDADIS-IV Threshold depression. Subthreshold depression.	AUDADIS-IV Alcohol abuse and dependence.	Age, gender, household income, education, marital status, race, retirement, (any mood disorder), (any anxiety disorder), (any personality disorder), any drug use/ substance use disorder.	Cross-sectional. Multiple logistic regression.	Threshold depression was associated with having any AUD 1.78 (1.53–2.08).
Merrick et al, 2008	65+	N=12413. Community-dwelling Medicare beneficiaries	Non drinkers. Moderate drinkers. More than 42 drinks per month. Binge drinking.	Participants were asked 2 questions regarding how depressed they felt in the past year.	(Age), (gender), (race), education, income, (marital status),location of house, self-rated health, Adl impairments, Smoking.	Cross-sectional. Logistic regression.	Self- reported depressive symptoms were positively associated with 42+ drinks/month among those who drink 1.59 (1.02–2.58).

Table 3. (continued)

Mowbray et al, 2016	57-85	N= 1643. Wave 1 data from the National Social Life, Health and Aging Project	Score of 2 or more on CAGE questionnaire.	CES-D	(Age), race, marital status, education, income, chronic conditions, antidepressant usage, socio-demographics, self-rated physical health, (physical activity)	Cross-sectional moderation analysis. Multivariate logistic regression.	Those with Multiple Chronic Conditions (MCC), who had depression experienced problem drinking 2.13 (1.08-9.09).
Perriera & Sloan, 2002	51+	N=12652. Health and Retirement Study. US	Score of 2 or more on CAGE. <1, 1-2, 3-4, 5+ drinks per day.	CES-D	Smoking, self-rated health, Chronic health conditions, (Functional status), mobility status, Cognitive status, (Psychiatric disorder).		5+ drinks per day were not associated with depression. Score of 2+ on CAGE was associated with depression.
Rodriguez et al, 2010	53+	N=1552. Florida BRITE Project. (Brief Intervention & Treatment for Elders)	Score of 3+ on S-MAST-Geriatric version	The Short-Geriatric Depression Scale	(Age), (race), gender, (education), living alone, (location of house).	Cross sectional. Hierarchical logistic regression.	Higher levels of depressive symptoms associated with screening positive for alcohol problems (1.81 (1.03-3.20).
Sacco et al, 2009	60+	N=4,646. National Epidemiologic Survey on Alcohol and Related Conditions.	Low risk, moderate, and high risk derived from Latent Class analysis of 11 diagnostic criterias of alcohol abuse and dependency.	DSM IV past year depression	(Age), (gender), income, marital status, education, (smoking), (child of alcoholic)	Cross-sectional. Multinomial logistic regression.	Having threshold depression was associated with increased odds of being a high-risk drinker.

Table 3. (continued)

St John et al, 2008	65+	N= 1028. Representative population registry in Manitoba, Canada	Score of 1 or more on CAGE questionnaire	CES-D	(Age), (gender), (education), marital status, social and emotional support. (living alone), cognitive impairment, (Self-rated health), (ALD or IADL impairment)	Cross-sectional. Multiple logistic regression.	Depression was associated with having an alcohol problem.
Van den Berg et al, 2014	60+	N=501. Netherlands Study of Depression in Older Persons.	Alcohol Use Disorders Intensification Test (AUDIT. Abstainer, moderate, at-risk.	Threshold, and subthreshold, depression. CIDI.	Age, gender, income, living alone, social support, social network, chronic health conditions, (smoking), cognitive function, antidepressants, loneliness, (functional limitation).	Cross-sectional. Multinomial logistic regression.	At-risk drinkers had higher levels of depression than moderate drinkers
Vaughan et al, 2014	50+	N=2142. Wave 1 of.NESARC	Alcohol use disorder (DSM IV critera). Currently drink. At least one episode of binge drinking.	DSM IV criteria. Lifetime threshold depression combined with dysthymia.	(Age), gender, (marital status), (income), health condition, any anxiety disorder.	Cross-sectional. Logistic regression.	Lifetime threshold depression was associated with greater odds of all 3 alcohol use outcomes

CIDI= Composite International Diagnostic Interview Depression. DSM IV= Diagnostic and Statistical Manual IV diagnosis. AUDASIS= The Alcohol Use Disorder and Associated Disabilities Interview Schedule. AUDIT-C= Alcohol Use Disorders Identification Test-Consumption. NESARC= National Epidemiologic Survey on Alcohol and Related Conditions. S-MAST= Short-Michigan Alcoholism Screening Test

As this thesis focuses on the 65 and over population, the seven findings in this age group were reviewed first, followed by the two findings in the 75 and over age group, and the 13 findings in the 50 and over age group.

In the 65 and over population, there were five studies where depression was significantly associated with drinking over the recommended guidelines or problem drinking. (Merrick et al, 2008; St John et al, 2008; Almeida et al, 2013; Coulson et al, 2014; Hansen et al, 2016). Three studies in the 65 and over population did not find significance (Hoeck and Van Hal, 2012; Marti et al, 2015; Bosque-Prous et al, 2016).

Regarding those studies that include adults aged 65+, no definite pattern could be discerned between factors included in the analyses that would explain the discrepancy in the results. Only two of the seven conducted in the 65+ population studied for predictors of depression and both found significance (Almeida et al, 2013; Coulson et al, 2014). Other significant predictors of depression in these two studies were poor self-rated health, pain, smoking, physical inactivity and chronic health conditions.

The remaining three significant studies all analysed depression as an independent variable with the alcohol measure as the dependent variable. Among these, mostly health related variables were controlled for, including those found to be significant for depression: self-rated health (Merrick et al, 2008; St John et al, 2008; Hansen et al, 2016), smoking (Merrick et al, 2008), and pain (Hansen et al, 2016). Additional health variables controlled for when depression was predictive of an alcohol use variable were medication use (Merrick et al, 2008), and disability (Merrick et al, 2008; St John et al, 2008). The only trend that can be discerned is that a majority of the significant studies

in the 65 and over age group controlled for self-rated health.

In the three studies (in the 65+ population) where there was no significance between depression and alcohol (Hoeck and Van Hal, 2012; Marti et al, 2015; Bosque-Prous et al, 2016), similar health variables were controlled for by Bosque-Prous and colleagues (2016) (smoking, chronic health conditions, self-rated health) and Marti and colleagues (2015) (smoking and chronic health conditions), while Hoeck and Van Hal (2012) only controlled for general health status.

There were no definitive differences in the alcohol measures used between the significant and non-significant findings. One further similarity was that two of the significant findings in the 65+ age group were in samples comprised of males (Almeida et al, 2013; Coulson et al, 2014). Males are more likely to drink at harmful levels than females (Nolen-Hoeksema, 2004), which may lead to this co-occurrence. Together, these results suggest a tentative association exists between depression and drinking beyond recommended guidelines/ problem drinking. This may be explained by the fact that self-rated health was more often than not controlled for in the significant findings.

Two studies were identified in the 75 and over age group, neither of which reported significance between depression and their alcohol use measure (Osborn, 2003; Weyerer et al, 2013). However, as noted previously, both measured for low quantities of alcohol. This may explain this lack of significance.

In the 50 and over population, current depression was significant with any alcohol use measure in 10 studies (Perreira & Sloan, 2002; Sacco et al, 2009; Rodriguez et al, 2010; Kim et al, 2015; Laborde-Lahoz et al, 2014; Van

den Berg et al, 2014; Vaughan et al, 2014; Bosque-Prous et al, 2016; Mowbray et al, 2016; Carvalho et al, 2018). Five studies in this age group reported no significance between current depression and any alcohol issue (Barry et al, 1998; Perreira & Sloan, 2002; Koster et al, 2006; Peltzer & Phaswana-Mafuya, 2013; Iparraguirre, 2014). While the 50-64 age group tend to drink at higher quantities (Morgan et al, 2009), and have slightly higher rates of depression than the 65+ age group (Barrett et al, 2011), this age difference does not have any discernable effect on whether the association between depression and any alcohol issue is significant or not.

Table 4.
Findings of no significance between depression and any alcohol use measure in older adults

Author and year	Age	Sample	Dependent variable (depression or alcohol)	Independent variable (depression or alcohol)	Confounders (Significant predictors)	Analysis	Comments/ measures
Barry et al, 1998	60+	N= 2732. Participants from Project GOAL (Guiding Older Adult Lifestyles)	(DSM-III-R) criteria for lifetime and current threshold depression	Moderate drinking, at-risk drinking. 2+ score on CAGE questionnaire.	(Age), (gender), marital status, (relatives), (social outings), (can visit 5 people), (smoking).	Cross sectional. Forward stepwise multivariate logistic regression.	No bivariate significance for any alcohol and any depression. Alcohol variables were not included in regression.
Hoeck and Van Hal, 2012	65+	N=4825. Belgian Health Interview Survey.	1+ or 2+ on CAGE. Abstinence, moderate drinking, at- risk drinking.	Depression subscale from Revised Symptom Checklist-90	Age, (gender), (education), income, tenant/homeowner, living alone, (social contact), smoker, (self-rated health), functional limitations, chronic health conditions.	Cross-sectional. Multinomial logistic regression.	No significance between any measure for alcohol consumption and depression.
Iparraguirre et al, 2015	50+	N= 9251. English Longitudinal Survey of Ageing, waves 4 and 5.	Moderate drinking, at-risk drinking, harmful drinking.	Depression based on whether the participant felt depressed for much of the past week.	(Age), education, marital status, (education), (income), (smoking), (physical activity), loneliness, caring, responsibilities, (employment), social detachment, religion, cultural engagement, social networks, diet, pain, frailty, living location, co-habitation.	Cross-sectional. Logistic regression.	No significance between any alcohol use category and depression.

CIDI= Composite International Diagnostic Interview. DSM III-R=Diagnostic and Statistical Manual III-Revise

Table 4. (continued)

Koster et al, 2006.	55+	N=2893. Ageing Study Amersterdam.	CES-D depression	Abstinent, less than 3 drinks per day, 3+ drinks/day.	Sex, marital status, education, income, network size, instrumental support, emotional support, mastery, self-efficacy, chronic health condition, smoking, BMI	Cross-sectional. Cox proportional hazard regression model.	No alcohol variables significantly associated with current depression.
Marti et al, 2015.	65+	N=11,191. National Survey on Drug Use and Health. US.	Lifetime abstainers, ex drinkers, binge drinkers & non-binge drinkers.	Lifetime and past year DSM-IV Depression.	Sex, marital status, education, race, employment status, income, religious beliefs, illicit drug use, smoke, chronic health condition.	Cross-sectional. Logistic regression with propensity score models.	No significance for abstinence or any consumption and past year depression. Lifetime abstainers 60% less likely to have lifetime depression.
Osborn et al, 2003	75+	N=14217. Trial of the Assessment and Management of Older People in the Community.	Geriatric depression scale 15	Moderate drinking, at-risk drinking.	(Age), (gender), (home ownership), (marital status), (significant life events), living alone, (confiding relationships), (smoking) (chronic health condition).	Cross-sectional. Logistic regression.	No significance between Any alcohol use and depression.
Peltzer & Phaswana-Mafuya, 2013	50+	N=3840. National population-based cross-sectional study in South Africa	CIDI Depression,. .	At-risk drinking	Age, gender, race, marital status, education, income, location of house, smoking,(quality of life), (chronic health conditions), (functional limitation), physical activity, cognitive status.	Cross-sectional. Unconditional multivariable logistic regression.	At-risk drinking was not associated in bivariate analysis, and not included in multivariate.
Weyerer et al, 2013	75+	N= 3214. Primary care patients.	Geriatric Depression Scale 15	<1 drink; 1–2 drinks; 2+ drinks.	(Age), gender, living alone, marital status, (education), cognitive status, (functional impairment), (smoking), Iadl, (memory), chronic condition, hearing, (vision).	Cross-sectional. Cox proportional hazard regression models.	No association between 2+ drinks/day and having depression

While reviewing these studies, it became apparent that two factors play a role in the association between threshold depression and drinking beyond the guidelines or problematic use: chronic health conditions and self-rated health. Having at least one chronic health condition was controlled for in all but one (Barry et al, 1998) of the nonsignificant threshold depression and alcohol associations (Osborn et al, 2003; Koster et al, 2006; Hoeck & Van Hal, 2012; Peltzer & Phaswana-Mafuya, 2013; Weyerer et al, 2013; Iparraguirre, 2014; Marti et al, 2015; Bosque-Prous et al, 2016). Of the 15 significant findings, only five studies controlled for this factor (Perreira & Sloan, 2002; Almeida et al, 2013; Vaughan et al, 2014; Mowbray et al, 2017; Carvalho et al, 2018).

The other relevant factor was self-rated health. This was included in seven of the 15 significant findings (Perreira & Sloan, 2002; Merrick et al, 2008; St John et al, 2008; Kim et al, 2015; Bosque-Prous et al, 2016; Hansen et al, 2016; Mowbray et al, 2017), and in only two of the nine nonsignificant findings (Hoeck & Van Hal, 2012; Bosque-Prous et al, 2016).

Apart from Mowbray et al (2017), which examined the moderating role of depression on the link between multiple chronic health conditions and problem drinking, the significance of these factors in the threshold depression and alcohol association have not been recognised in the research literature. While they are not definitive, self-rated health and the presence of chronic health conditions might be representative of factors that affect the depression and alcohol association in this age group.

Taking an overview of the reviewed literature, whether participants were aged 50+ or 65+ did not discernibly affect the depression and alcohol

association. Alcohol use variables that measure for indications of having an alcohol problem or AUD alone or in conjunction with increased consumption, were almost always significant predictors of depression. Increasing quantity of consumption was predictive of current depression, though only one study measured for harmful drinking (without measuring for indications of having an alcohol problem), and found no significance. In that study, harmful drinking was the dependent variable (Iparraguirre et al, 2014). And more often than not controlling for self-rated health and chronic health conditions appeared to be decisive factors in whether the depression alcohol association reached significance.

Subthreshold Depression and Alcohol

To date, research on depression and alcohol in the older population has not taken into account subthreshold depression, despite its prominence among older adults. The current understanding of depression suggests that it exists on a continuum: approximately 8-10% of older adults with subthreshold depression develop threshold depression in the space of a year (Meeks et al, 2011). As subthreshold depression is the most common form of depression in the older adult population, it is important to measure for it when assessing markers for depression such as at-risk or harmful drinking. Thus far, the literature on depression and alcohol has not given this important aspect of older adult depression the recognition it deserves.

Of the research on the association between depression and alcohol among older adults, only two studies were found to include subthreshold depression. Neither found significance for an association with problem drinking (Rodriguez et al, 2010) or any alcohol use disorder (Laborde-Lahoz et

al, 2014). Due to limited controlling factors these are at best preliminary findings. Van den Berg and colleagues (2014) included subthreshold depression in that a scale of depressive symptoms was used, as did Kim et al (2015). If these findings are indicative, subthreshold depression may not be significantly associated with at-risk or harmful drinking. The paucity of the research in this area points to the need for further research.

Depression and abstinence

Abstaining from alcohol, and misusing alcohol, are often both associated with depression in general adult populations, whilst drinking moderately appears to be a protective factor (Degenhardt & Hall, 2001; Alati et al, 2005; O'Donnell et al, 2006). In adults aged 50 and over, moderate consumption has also been found to be a protective factor against having depression (Lang et al, 2007). While it is not yet known whether harmful drinking is predictive of depression, at-risk drinking might be (Merrick et al, 2008; Almeida et al, 2013). Abstinence will now be reviewed using a subsample of those studies which measured for abstaining from alcohol.

There is evidence that abstaining from alcohol use is associated with depressive symptoms in English adults aged 50 and over (Lang et al, 2007), with diagnosed depression in Korean adults aged 60 and over (Kim et al, 2015), in Dutch adults aged 60 and over (Van den Berg, 2014), and Australian males aged 65 and over (Coulson et al, 2014). A further study in an Australian study spanning middle age (45-54) to oldest old (85+) age groups found that male abstainers were more likely to have depression than moderate drinkers and binge drinkers (more than four standard drinks per day), while female abstainers were as equally likely as binge drinkers to have depression (Tait et

al, 2012).

Adults aged 65 and over who had abstained from alcohol throughout their life, however, are 60% less likely to have lifetime depression; there was no association with current depression (Marti et al, 2015). In the 75 and over population, abstinence from alcohol was a risk factor for depression in univariate analysis but when smoking, functional impairment (vision, hearing, mobility), cognitive impairment, and chronic health conditions were controlled for the association lost significance (Weyerer et al, 2009).

While abstinence might not be harmful in itself, findings in younger populations (aged 20-42) suggest that factors related to it, such as a lack of social interaction as a result of abstaining (Lucas et al, 2009) might explain the cause of its association with current depression. A popular hypothesis is that people who stopped drinking due to having been heavy drinkers in the past, otherwise known as sick-quitters, are more likely to have depression than people who abstain for other reasons but this is likely a myth (Skogen et al, 2009). There is also the possibility that adults (aged 65 and over) who are more likely to experience multi-morbidity, abstain due to advice from their doctor (Salive, 2013). As this multi-morbidity includes depression (Salive, 2013) and is associated with it (Glaesmer et al, 2011), this may partially explain the association between abstinence and depression in the older population.

Reasoning Behind the Association Between Depression and Alcohol

A large body of qualitative research exists on primary care practitioners' perspectives on depression in their older adult patients (McCrae et al, 2004; Burroughs et al, 2006; Murray et al, 2006; Barley et al, 2011; Gordon et al, 2018), as well as older adult perspectives of depression (Barg et al, 2006; Burroughs et al, 2006; Lawrence et al, 2006; Wittink et al, 2006; Holm & Severinsson, 2013; Holm et al, 2013; Bjørkløf et al, 2015). A slightly smaller body has focused on the perspectives of older adults regarding their alcohol consumption (Immonen, Valvanne, & Pitkala, 2011a; Immonen, Valvanne, & Pitkala, 2011b; Bamberger, 2015; Britton & Bell, 2015, Haighton, 2016, Haighton et al, 2018,). There is a lack of studies that focus on the perspectives of health practitioners who treat this population, on drinking in late life (Lock et al, 2002; Wadd & Galvani, 2014; Maclean et al, 2015). Moreover, there is a lack of qualitative research that explores the depression and alcohol association in this population.

Older adults who take up drinking in late life tend to do so as a means of coping or self-medicating depression, loneliness, and a lack of meaning in life (Aira et al, 2008). Some of the more common reasons provided by older adults who begin drinking at high levels are socialising, or to self-medicate anxiety or depression, or poor physical health, or because of retirement, isolation or boredom/loneliness (Haighton, 2016). Almost a quarter (24%) of older Finnish adults use alcohol to self-medicate depression (Immonen et al, 2011b), while 23% of those of those aged 75 and over use it to self-medicate any mental problem (Aira et al, 2008).

Self-medicating depression with alcohol can result in an increase in consumption to risky or harmful levels, and a corresponding increase in depressive symptoms in a mixed age adult population (Holahan et al, 2003). Older adults who engage in at-risk drinking, and use this to self-medicate, tend to do it to cope with feelings of meaningless in life, loneliness, depression and anxiety (Immonen et al, 2011a). Further to this, alcohol has been cited by older adults as being the cause of their depression, and vice versa, where older adults describe the relationship as a question of "the chicken or the egg" (P.10, Haighton et al, 2018).

For many older adults, depression is seen as a consequence of old age, albeit a dysfunctional one (Lawrence et al, 2006). Relationships are of vital importance because they are believed to be a buffer against developing depression, both because they offset loneliness, and because they are recognised as providing a source of meaning in the lives of older adults (Holm et al, 2013). Loss, in terms of health, their role in life, their freedom and their loved ones, are common themes cited by older adults, as is the idea of depression as an illness (Lawrence et al, 2006).

The perception of depression as an illness could play a role in self-medication, or the self-medication may be less of a conscious decision. Older adults coping with depression describe their experience as one of loneliness, isolation (Holm et al, 2013), and being stuck i.e. they felt helpless and powerless (Bjørkløf et al, 2015). In Bjørkløf and colleagues' (2015) study, most participants had histories of depressive episodes and had developed ways to reduce their symptoms such as physical, social and religious activities, but found that these no longer provided the relief they once did. This realisation

added a dimension of panic and anxiety to their depression. Whether older adults in this situation might resort to alcohol is an area that may be explored in the qualitative phase.

It is possible that older adults who do not seek treatment for their depression are likely to use alcohol to cope. Regarding seeking help for depression, older adults who conceptualise their depression as an illness see it as a legitimate complaint and thus something that can be treated (Lawrence et al, 2006), however others perceive depression to be a consequence of old age (Lawrence et al, 2006). This may contribute to under-diagnosis as those who do not see it as an illness are less likely to approach their GP about it (Burroughs et al, 2006). However, even those who do recognise it as a treatable problem can be inclined, culturally, to believe it to be something that they are responsible for, while perceiving their doctor to have an ancillary role in its treatment (Switzer et al, 2006). Some older adults regard depression as a sign of weakness, and perceive a stigma against having it, resulting in their not seeking treatment (Murray et al, 2006). This might be why both older adults and GPs report that older adults are generally less likely to report psychological difficulties to their GP (Murray et al, 2006).

The older adult's relationship with their GP might be a further barrier to diagnosis. If, for example, the older adult believes they are a good patient, they are less likely to bring up emotional difficulties (Wittink, Barg, & Gallo, 2006). The perceptions of GPs on older adult depression are mixed. While they can be adept at identifying low mood in older adults, even when the adults themselves do not mention it (Wittink et al, 2006), a tendency exists whereby older adult depression is seen as inevitable, and doctors exhibit therapeutic

nihilism, that is, they believe that treatment will not be effective (Burroughs et al, 2006). This may be why, in a survey of social care practitioners, GPs were believed to not prioritise depression in their older patients and be less likely to offer psychosocial treatment in this age group (McCrae et al, 2005).

As a result, it is important to understand primary and secondary healthcare practitioners' perceptions of older adult mental health and alcohol consumption. Gathering data from these two levels of health care providers may shed light on the under diagnosis of mental health problems in this age group. As this association has yet to be qualitatively analysed, these participants are in a position to provide a wide range of knowledge about their older adult patients (Marshall, 1996), and so can provide a broad overview of the mental health and alcohol consumption relationship in this population. In this way interviewing these participants may highlight areas to be explored through the perceptions of older adult's themselves in future studies.

Summary

The literature on depression and alcohol consumption in older adults is increasing. Within this pool of research, there are a number of gaps. There is a lack of research that measures for subthreshold depression, an aspect of older adult mental health that is receiving increasing attention. By measuring subthreshold depression and its association with alcohol consumption, a more nuanced picture of depression in older adults can be drawn, which might result in earlier diagnosis and monitoring of symptoms, with the result of earlier treatment.

Studies that record significant associations between threshold depression and alcohol tend to control for less factors, though this is not always

the case. There are two factors that may affect the association between depressive symptoms and at-risk or harmful drinking: the presence of one or more chronic health conditions, and self-rated health. Studies that control for chronic health conditions tend to record findings of nonsignificance, while those that control for self-rated health mostly find significance. To my knowledge, this pattern of relationships has not been formally recognised in the research literature. Additionally, there is a dearth of studies that assess the association between harmful levels of drinking and threshold depression. This is particularly relevant in an older adult population in Ireland where harmful drinking is the norm (Mongan & Long, 2016). This thesis will be the first study to use a mixed methods design to quantitatively analyse the strength of the association between harmful drinking and depression in this population. It will also be the first to qualitatively analyse this association through the perspectives of GPs and psychiatrists on their professional experience with older adult depression and its association with alcohol use.

Chapter Four: Methodology and Methods

Design

A sequential explanatory, mixed methods design (Ivankova, Cresswell, & Stick, 2006) was chosen for this thesis. Before elaborating on this design, and the reasoning behind its use, it is necessary to review quantitative and qualitative methodologies, and the guiding philosophies between each to assess their strengths and limitations as this will illustrate the need to use the two in a sequential mixed method design format. Before this I will set out some of the terms used to discuss the philosophical underpinnings of these methodologies (table 5.) as definitions for these can differ between researchers, (Morgan, 2007). The paradigm is the world view of the researcher. Ontology concerns "the nature of reality and, therefore, what can be known about it" (p.108, Guba & Lincoln, 1994). Epistemology concerns "the nature of the relationship between the knower… and what can be known." (p.108, Guba & Lincoln, 1994). Methodology is the way in which the researcher goes about finding the reality in which they believe.

Table 5.
Philosophical underpinnings of terms used

	Postpositivism	Constructionism	Pragmatism
Ontology	One reality that cannot be fully discovered or measured	Multiple socially constructed realities	Reality is continually created through experience in interaction and transaction with the world
Epistemology	Modified Dualism/ Objective	Interactive and interpretive	Ideas and knowledge are evaluated according to their consequences
Methodology	Mostly quantitative	Mostly qualitative	Methods are matched to research questions

Adapted from Mertens & Wilson (2012) (as cited in Mertens & Tarsilla, 2015)

Quantitative research design. Quantitative research is generally associated with the positivist paradigm which is premised on the understanding that, firstly, an objective reality exists and that this is independent of the observer. It follows that this objective reality can be discovered through the use of scientific methods. Much modern quantitative research however, is premised on postpositivist thought, which took root in the late 1950s (Tashakkori & Teddie, 1998). While retaining the notion of an objective reality postpositivism argues that this may not be fully observable and so researchers must work with a constructed understanding of it (Guba & Lincoln, 1994). This ontological stance is referred to as critical realism; a realism that is critical of the ability to fully observe reality (Guba, 1990). It is because of this stance that the results of experimental analyses are not said to be true or false, rather they are subject to

hypothesis testing where the results decide whether the null hypothesis is rejected or failed to be rejected (Creswell, 2013). The epistemological stance of postpositivism is modified dualist/ objectivist (Guba, 1990). Within this stance, subjectivity is an ideal that should be worked toward, with the understanding however that this ideal is ultimately unattainable. The researcher attempts to reduce any existing bias, and experimental errors. The scientific process is then a communal activity (Phillips & Burbules, 2000), where new additions to the body of knowledge are open to peer review. New research is either added to the body of research or rejected for experimental error. This body of knowledge is considered as close to reality as is possible, until new research disrupts it (Guba & Lincoln, 1994). In this thesis measures for depression, anxiety, alcohol consumption and all other variables had been previously tested to assure they measured their specific domains to ensure they reflected reality e.g. the possibility of each participant having diagnosable depression or anxiety.

In the postpositivist paradigm, the researcher develops hypotheses about reality, collects data relevant to these hypotheses and tests it in a quantitative manner (Creswell & Plano Clark, 2007). The scientific method in this thesis was a secondary, cross sectional, statistical analysis which used a large sample size so as to ensure the findings were representative of the population under study (community based adults living in Ireland aged 65 and over).

One of the major strengths of quantitative research is that by analysing a large amount of data, it can quickly detect patterns that might otherwise have

remained indiscernible. These patterns, as in this thesis, can be generalised to wider populations. This enables the research to build upon previous quantitative knowledge through the testing of previously formed theories and hypotheses. The structured nature of quantitative analysis allows for comparison with similar studies, such as the comparisons between the Longitudinal Study of Ageing in England (ELSA), Europe the Health and Retirement Study in America (HRS), and the Survey of Age, Health, Ageing and Retirement in Europe (SHARE), and Ireland (TILDA). And, as quantitative research is structured, statistical analyses can be replicated which confirms their truth through their reproducibility.

A major weakness of quantitative research, which paradoxically is also one of its strengths, is its reductionist nature. To quantitatively research a subject, it is necessary to reduce ideas and phenomena related to this subject into smaller sets of testable data such as hypotheses (Creswell, 2013). By reducing phenomena in this way, hypotheses can lose their complexity and the greater context in which they are situated. Measures are needed to convert the phenomena into testable numerical variables. This effectively removes much of the subjective, unquantifiable, experience of being human, such as beliefs and perceptions, from the reach of quantitative study. This can also be a strength in that it reduces these complex aspects of reality into their underlying basic factors (Warne, 2017), and by doing so, these can be tested in a rigorous and replicable manner (Verschuren, 2001).

As this thesis was cross sectional, a purely quantitative approach could determine if a relationship between the chosen variables exists, and what the

strength of these relationships was, but it was limited in its ability to discover any deeper understanding of these relationships. Cross sectional designs are unable to determine causality as the data is captured at one point in time (Thelle & Laake, 2015). This inability to provide a better understanding behind possible relationships between variables is a shortcoming. One of the benefits of mixed methods research is that these limitations of quantitative research can be offset by the strengths of qualitative research (Creswell & Plano Clark, 2017). In this thesis, the qualitative phase bolstered this limitation by providing in-depth insight into the meanings, perceptions and reasoning behind the quantitative results.

Qualitative research design. Qualitative research generally derives from the constructivist paradigm (Creswell & Plano, 2007). Constructivism has its roots in a wide range of philosophies and artists but psychological constructivism derives from Personal Construct Psychology (Raskin, 2002). The ontological stance of constructivism is that reality as experienced is constructed through the perception of each individual. Similarly to postpositivism, each individual will have differing perceptions based on their individual differences and the cultures within which they live (Crotty, 1998). However, these differences are not seen as biases but essential aspects of each individual's perspective. While postpositivism posits the existence of one reality, i.e. ontological realism, constructivism posits the existence of multiple realities, each as valid as the other i.e. ontological relativism (Guba & Lincoln, 1994). The relationship between the researcher and the participant in this paradigm is collaborative. The researcher must work with the research

participants to co-construct a new reality (Lincoln & Guba, 2011), with the understanding that their own perspective is coloured by their life experiences which will influence this collaboration (Hennink, Hutter & Bailey, 2010). As the name implies, in qualitative research, the focus is on the quality of the data over its quantity. While quantitative research provides second-order understandings of the world, qualitative research seeks to provide a first-order understanding using rich levels of description (Brinkman, 2014). It is concerned with the way in which people understand themselves and their world, thus there is an emphasis on empathy and identifying with the participants so as to better understand their perspectives (Corbin & Strauss, 2008). This emphasis on working from the participant's perspective is referred to as the emic perspective, as opposed to an etic perspective which works from the researcher's perspective (Fetterman, 2008). In qualitative research the researcher begins with the emic perspective and when data has been collected from a number of participants, the researcher adopts an etic perspective in an attempt to understand the data (Fetterman, 2008).

In comparison to quantitative research qualitative methodology does not reduce psychological phenomena into linear or dimensional forms with the intent of measuring and comparing them. Rather, the focus is on the quality of the phenomena, and its place in the wider social or psychological context (Taylor, Bogdan, & DeVault, 2015). The subject of qualitative research, therefore, can be broader and more complex, while retaining the ability to find and present patterns from the data collected. Another distinctive aspect of qualitative research is the use of inductive reasoning in analysing data.

Inductive reasoning is process of reasoning where patterns in the data are observed and used to develop conclusions. In the case of this thesis, patterns in the data collected from the interviews are used to develop themes, in other words, the process of reasoning moves from the specific to the general. This is opposed to deductive reasoning, which is used in quantitative analysis, and where the process of reasoning moves from the general to the specific, such as moving from a hypothesis to a specific conclusion. Qualitative research is a more open-ended research process than quantitative research which uses deductive reasoning which involves moving from the general to the specific, or testing hypotheses using analysis (Teddlie, & Tashakkakori, 2009).

As qualitative research values the subjective nature of participants' experiences, and focuses on the person and their beliefs and attitudes in a holistic manner, without reducing these aspects into measurable variables (Taylor, Bogdan, & DeVault, 2015), there is less consensus on how to verify the validity, reliability and generalisability of qualitative research (Leung, 2015). Part of the difficulty in achieving consensus is the diverse nature of qualitative research and that the concepts of validity and reliability are derived from positivist methodologies (Leininger, 1992). Morse et al (2002) suggest that while it is useful to retain the understanding of validity and reliability for qualitative research, different strategies are required to achieve these. These strategies are discussed with reference to the current thesis in the methodology section of phase two.

Rationale for choosing a sequential explanatory design. The mixed methods, sequential explanatory design was the best fit for this thesis' aims.

This is one of the most straightforward (Creswell, Plano Clarke, & Gutmann, 2003), and one of the more popular of the mixed methods designs (Ivankova, Creswell, & Stick, 2006). It usually begins with a dominant quantitative analysis, followed by a less dominant qualitative analysis. The initial quantitative analysis has the priority of addressing the majority of the aims of the study. The qualitative data collection and analysis are then used to refine and explain the findings of the initial analysis (Ivankova, Creswell, & Stick, 2006). The follow-up explanations variant of sequential explanatory design was used in this thesis (Creswell & Plano Clark, 2007). In this the findings of the initial quantitative phase are expanded on in the second phase where the researcher collects qualitative data from participants that seeks to explain and/or contextualise the quantitative findings. A sequential explanatory design was chosen because neither quantitative nor qualitative methods on their own were sufficient to capture the complexity of the relationship between older adult mental health and alcohol consumption. It provided the best way of overcoming the inherent limitations of quantitative and qualitative research methodologies. The main limitation of this design is the length of time required to collect two different sets of data and analyse both. This was surmounted in this thesis because the data to be analysed in the quantitative phase had previously been collected by TILDA. Three further decisions to be made when choosing a mixed methods study are deciding the timing of the two phases, the priority of the phases, and the level of mixing of the methods (Creswell & Plano Clark (2007).

When designing this thesis, it was foreseen from the beginning, during the development of the objectives, that it would need to include both quantitative

and qualitative methods. One of the reasons for this was that the majority of data on older adult mental health is quantitative, thus a quantitative phase was developed to build on this data, and explore the relatively understudied relationship between older adults' mental health and alcohol consumption.

By analysing the TILDA wave 2 dataset, with its nationally representative sample, patterns in the various associations between the two mental health disorders and varying levels of alcohol consumption could be readily discerned. The decision to develop, from the findings of this analysis, a qualitative phase, emerged as it became apparent that it would be necessary to contextualise the quantitative findings, and explain them within in the older population living in Ireland, especially as there has been so little research conducted in this area in Ireland, and internationally. As such, the sequential explanatory design, where the quantitative analysis precedes the qualitative analysis, was found to be the most appropriate due to the timing of the quantitative and qualitative phases.

One consideration of a mixed methods design is when and how the methods are integrated. Integration is the "mixing' in a mixed methods study" (Doyle, Brady, & Byrne, 2016). A high level of integration builds on the strength of each method, and thus on the strength of the study itself. There were five points of integration between the two methods in this thesis. The first point was in the writing of the objectives. It was clear that a purely quantitative thesis could not achieve each objective, so a qualitative phase was developed. The second point of integration was in the design of the thesis. A sequential explanatory design was chosen which mixes the two strands in a sequential

manner, using the latter to contextualise the findings of the former from the perspective of health practitioners (Ivankova, Creswell, & Stick, 2006). The third was in the use of the results from the quantitative analysis to inform, and develop the qualitative phase, to the extent that the sample and data collection tools for the qualitative phase were not chosen until the quantitative results had been generated. At this point decisions had to be made regarding which results to explore. The fourth point of integration was in the merging of data analysis. Initially, the quantitative phase was analysed and this informed the qualitative phase as stated above. Subsequently the qualitative phase was analysed. Then the results of each analysis were merged in a joint display matrix in the qualitative results chapter, and interpreted together. Finally, the last point of integration was in the discussion stage, where the two sets of findings were interpreted together. These integration points as well as the timing and weighting of the methods can be seen in figure 1.

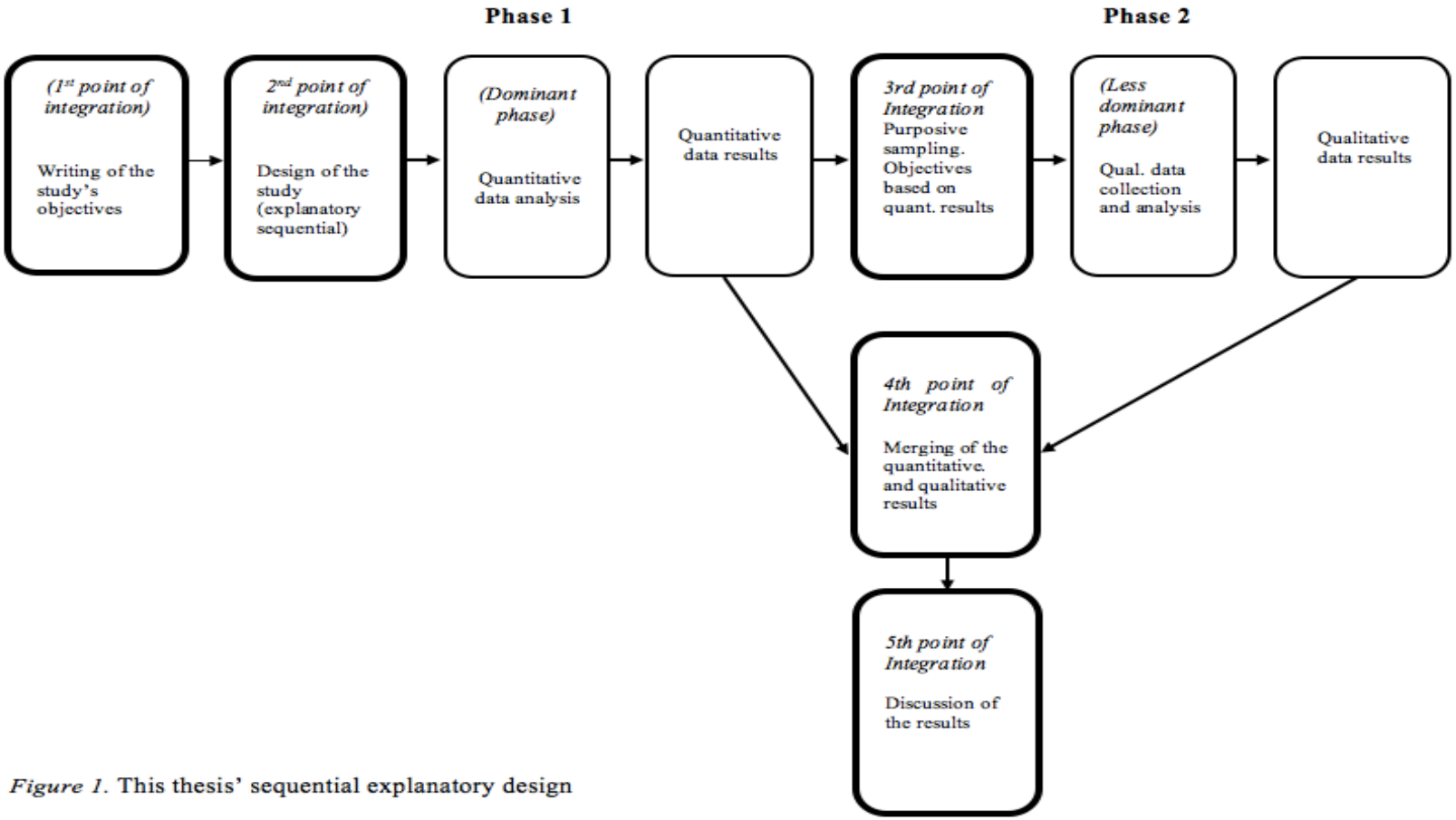

Figure 1. This thesis' sequential explanatory design

Mixed methods research design. Regarding the philosophical position of mixed methods designs, as quantitative and qualitative methods were strongly connected to existing paradigms, i.e. postpositivism and constructivism, researchers who first integrated the two methods sought a suitable paradigm to support this integration (Teddlie & Tashakkori, 2003). Teddlie and Tashakkori (2009) trace some of the earliest mixed methods studies to the 1920s, when the design enjoyed a brief popularity before researchers grew loyal to either the quantitative or qualitative traditions. As Onwuegbuzie and Leech (2005) note, the division between quantitative and qualitative research became strongly entrenched in the social sciences, to the extent that many researchers believed in the Incompatibility Thesis (Howe, 1988). This is the position that the two research approaches are incompatible at the epistemological and methodological level. It was not until the 1990s that mixed methods became a distinct methodological orientation, with it being referred to as the third methodological movement, after quantitative and qualitative research (Teddlie, & Tashakkori, 2009). A number of paradigms have been proposed and associated with mixed methods research. These include the transformative-emancipatory paradigm, which has as its aim the critique of inequalities in research practice, and the promotion of change toward more equitable practices using feminist and cultural perspectives(Osborn, 2008). Dialectic pluralism has also been associated with mixed methods. This assumes that multiple realities exist and as such there are many paradigms and philosophies that must be respected using a dialectical approach (Johnson, 2012). Critical realism is another philosophy associated

with mixed methods. This operates from the assumption that reality exists independent of individual perceptions, but that our knowledge of this reality is socially constructed, and that this can be studied (Denzin & Lincoln, 2011). Pragmatism is one of the better known and more frequently used (Creamer, 2017). This was the paradigm was chosen to guide this thesis for the following reasons. Firstly, as it's ontological position could be said to be a combination of postpositivism and constructivism, it seemed like an ideal paradigm for mixing methods associated with these. Whereas postpositivism posits that reality can be approached but never reached, and constructivism posits that everyone creates their own reality, pragmatism provides a middle ground where some aspects of reality are objective and unreachable and other aspects of reality are subject to individual perception (Greene, 2007). The epistemological stance of pragmatism is that objectivity and subjectivity exist on a continuum (Teddlie & Tashakkori, 2003). It is essentially the position that an ideology or theory is true if it works. While it has a rich philosophical background (Hall, 2013), it was not until Pierce conceptualised it in 1878 that it was recognised as a philosophical tradition (Pierce, 1878).

William James built on Pierce's work, writing that pragmatism's "only test of probable truth is what works best in the way of leading us, what fits every part of life best and combines with the collectivity of experience's demands, nothing being omitted" (James, 1907, p.44). The interest is not in an objective truth so much as what is practical, and beneficial and it is this that becomes the truth. This fits with my personal philosophy. In terms of research methodology, pragmatists subscribe to the belief that approaches such as postpositivism and constructivism are tools developed to frame our

understanding of the world; rather than being natural laws, they are prone to fallibility (Goodman, 2005), and as such should be considered and valued for their practical nature rather than their metaphysical nature.

In research design this means that some parts of research questions may be more suitably analysed using quantitative methods and others are more suited to qualitative methods. The pragmatic opinion is not that these two methods are incompatible, but that they are equally valid approaches depending on the research question (Teddlie, & Tashakkori, 2003).

A mixed methods design which combined quantitative and qualitative methods in a sequential manner provided the best way of understanding the association between mental health and alcohol consumption in an older population living in Ireland. Most quantitative research conducted in this area to date has focused on alcohol, with less emphasis on mental health disorders such as depression and GAD. Regarding qualitative research, while there is a healthy body of research on older adults' relationship with alcohol consumption, and while a number of studies have explored older adult mental health, no studies appear to have given near equal weight to the two topics in their analysis. The quantitative phase analysed the associations between depression and alcohol consumption, and GAD and alcohol consumption, while controlling for known and probable confounding factors. The qualitative phase explored the more interesting of the quantitative findings. The findings of these two phases, Phase one the quantitative phase and Phase two the qualitative phase, were integrated in the discussion. The methods for these two phases will now be discussed, beginning with phase one.

Phase one

The quantitative phase of the thesis analysed the second wave database from the Irish Longitudinal Study of Ageing (TILDA) which was collected in 2012 (Donoghue et al, 2014). TILDA is a national research project which aims to improve the data available in older adults in Ireland. It aims to do this through the use of interviews conducted every two years for a period of 10 years with a population representative sample of 8,000 + older adults living in Ireland. These interviews cover a wide variety of domains, including mental, physical, and cognitive health, economic circumstances, and social aspects such as friendships, family relationships and social participation. These domains, and the instruments used to measure them, were chosen with reference to longitudinal studies from other countries such as the English Longitudinal Study of Ageing (ELSA) (Lang et al, 2007), and the Health and Retirement Study in America (HRS) (Østbye, Taylor, & Jung, 2002), and the Survey of Age, Health, Ageing and Retirement in Europe (SHARE) (Castro-Costa et al, 2008). TILDA is an inter-institutional initiative, led by Trinity College Dublin, in association with University College Dublin, other third level institutions throughout Ireland, and the Economic and Social Research Institute.

The depth and variety of TILDA's database makes it an invaluable resource for researchers, and policy makers, who are interested in this rapidly growing population. The dissemination of the ensuing research will add to the development of Irish policy on ageing, an area that is gradually receiving greater attention as the population of older adults continues to expand in Ireland. It will also give a voice to this population within the national conversation (Barrett et al, 2011). Wave 2 was chosen in particular due to it

being the most recent wave available at the time, and the addition of improved measures.

Participant Profile and Recruitment. The quantitative phase of this thesis analysed the database of the Irish Longitudinal Study of Ageing (TILDA) (Donoghue et al, 2014). Participants for this phase were sourced from this database. The inclusion criteria for the TILDA study were to be living in a residential address in Ireland, aged over 50, and living in the community. For this thesis, inclusion criteria were being the age of 65 and/or over, and living in the community in Ireland (i.e. not living in a long-term care institution).

One of the aims of TILDA was to study a representative sample of Irish adults aged over 50. This was achieved by generating a design which gave each member of the representative population a non=zero probability of being selected. The sampling frame chosen to achieve this was the Random Sample Design for Ireland (RANSAM) (Whelan, 1979). The RANSAM was developed by the Economic and Social Research Institute to provide a tool for researchers aiming to carry out surveys on a national level. It is updated each year with details of all registered residential addresses in Ireland from the Electoral Register, An Post (the state owned provider of postal services in Ireland), and the Ordnance Survey. It has been used in many Irish surveys and studies, is fully computerised, and accurate (Barrett et al, 2011).

The TILDA study used a two stage sampling framework. In the first stage, Ireland's residential addresses were grouped into 3,155 clusters using RANSAM. Each cluster represented a townland, or an aggregation of townlands, each ranging from 500 to 1180 addresses. Of these, 640 clusters were selected, with the aim of achieving proportionate stratification by three

socio-economic groups, and by geography. This was done by first using statistics compiled by the Central Statistics Office, to stratify the counties within the clusters by socio-economic grouping, which was based on employment status. Geographic stratification was then achieved using RANSAM to randomly sort, within these socio-economic groups, clusters within each county using a probability of selection proportional to the number of adults aged 50 and over within each cluster.

The second stage within the TILDA sampling framework involved a selection of 40 addresses from each cluster using simple random sampling. These addresses were divided into an initial sample list (25,600 addresses) and a reserve list (6,400 addresses). The reserve list was to be used if the target sample size of the TILDA study (8,000) was not reached; however, the initial sample list provided the target sample size. This sample was self-weighting, which means that every adult aged 50 and over who lives in Ireland had an equal probability of being selected for participation.

Each of the chosen households from the chosen clusters were visited by an interviewer from TILDA. The eligibility of the address, and determination of how many adults aged over 50 lived at the address were confirmed. From each selected household, all individuals aged 50 and over were invited to participate in the study. In the pilot studies the overall response rate was less than expected so a public relations campaign was launched to raise the profile of TILDA. A further method chosen to improve response rate was the use of a financial incentive of €20. The use of a financial incentive, especially a nominal amount is, in my opinion, ethical as participation in TILDA, unlike say in drug trials, does not pose a potential risk to participants. In total, 8,178

interviews were conducted with respondents aged 50 and over from 6,282 eligible households. The household response rate was 62%. Of the 8,178 respondents from the first wave of TILDA, 6,995 participated in the second wave. Within the 65+ age group, the first wave included 3507 participants. In the second wave 3455 participants were aged 65+, meaning there was a 1.5% loss to follow up rate. This 3455 is the sample for this thesis. The sample size requirements will be discussed in the analysis section.

Data Collection

TILDA is a longitudinal study which collects data every two years. The second wave was released in 2015, using data collected from 2012 to 2013. The quantitative phase of this thesis had access to the data as collected from TILDA wave 2. TILDA collected data using three methods. A computer aided personal interview (CAPI), the self-completion questionnaire (SCQ) and a health assessment which was completed in the participant's home or in a dedicated TILDA centre by trained nurses.

Respondents for the TILDA study signed informed consent forms which, in addition to issues of anonymity and what would be required of them if they were to participate, informed them that they would be contacted for future waves of the TILDA study. Each respondent that agreed to participate in the study underwent a structured Computer Aided Personal Interview (CAPI) in their own home with a trained interviewer.

More than 100 interviewers were trained to conduct the CAPI interviews. The CAPI included questions on the domains of demographics, health and healthcare, employment, retirement, sources of income, assets, physical and cognitive health, memory, chronic conditions, falls, pain, actives

of daily living, instrumental activities of daily living, depression, smoking, exercise, sleep, alcohol, anxiety, social circumstances, family, and assets.

The Self Completion Questionnaire (SCQ) included questions on topics of a sensitive nature which, it was believed, participants would feel more comfortable completing themselves. These questions included depression, worry, anxiety, alcohol consumption, social connectedness, loneliness, perceived stress, stressful life events, and quality of life. The SCQ took 15-20 minutes to complete. Participants could choose to complete the SCQ while the interviewer was in their home, or at another time and return the questionnaire by post. In both the CAPI and the SAQ some of these domains were addressed through the use of embedded previously validated instruments.

Data collection tools. In this section the tools used to measure the main dependent variables of depression, and generalised anxiety disorder, and the tools used to measure the independent variables will be discussed. One of the main reasons why the second wave TILDA dataset was chosen over the first wave was the inclusion of improved measures for depression, and generalised anxiety disorder, and alcohol use. New relevant insertions included The Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990), The Center for Epidemiologic Studies Depression Scale (Radloff, 1977), and The standard quantity frequency approach for alcohol consumption (Dawson, 2003).

As the dependent variables consisted of pre-formed validated scales computed and scored within the database, these were ready to use. A number of independent variables required cleaning and recoding. The alcohol variable in particular needed substantial cleaning, calculation and categorisation. This

processing is detailed under the alcohol variable heading. The cleaning and recoding done on other independent variables are detailed under their individual headings.

The Center for Epidemiologic Studies Depression Scale (CES-D). The Center for Epidemiologic Studies Depression Scale was used to measure for subthreshold and threshold depression. The CES-D (Radloff, 1977) is a 20 item self-administered scale which screens for symptoms of depression within the past week. It was developed by the Center for Epidemiologic Studies to measure depressive symptoms within the general population in epidemiological studies. It has been used extensively in large scale studies such as (ELSA) (Lang et al, 2007), the Dynamic Analyses to Optimise Ageing Project in America (Tait et al, 2012), and the American National Social Life, Health, and Ageing Project (Choi, & DiNitto, 2011). It has an internal consistency of 0.85 and a test-retest reliability of 0.54 (Radloff, 1977).
In a population of adults aged 55-85, with diagnoses of depression from the Diagnostic Interview Schedule (Robins et al, 1981) as criterion, it had 100% sensitivity, 88% specificity, and 13.2% positive predictive value for identifying depression (Beekman et al, 1997).

The questions utilise a Likert scale format, with 1 indicating “rarely or none of the time (less than 1 day)”, and 4 indicating “all of the time (5-7 days)”. For scoring responses were assigned a value of 0, 1, 2 or 3. The score from the 20 questions therefore ranges from 0-60. The commonly used cut off point for depression of ≥16 was used to identify threshold depression in participants (Radloff, & Locke, 1977).

As the CES-D was not originally designed to measure subthreshold depression, there is no official cut-off point for subthreshold depression. However, Hybels, Pieper, and Blazer (2009) developed a modified version of the CES-D with a cut-off point of 8 for subthreshold depression. This was then compared to the original scale which was also used in this thesis which has a cut-off point of 16. The sensitivity between the two for subthreshold depression was 94%, the specificity was 92% and the c-index was .98% (Hybels et al, 2009). Following this, and other studies such as Cohen et al (2009), subthreshold depression was identified when participants scored >8 and ≥15 using the same CES-D scale. The variable was available in the TILDA dataset in both this categorical form and in a continuous form. In this thesis the categorical form was used, with participants being categorised as having no depression (<8), subthreshold depression (>8 and ≥15), and threshold depression (≥16). This three category variable was used for univariate analyses and the GAD regression model. For all other analyses it was divided into two separate categorical variables. The first was no depression (<8), and threshold depression (≥16). The second was categorised as no depression (<8), and subthreshold depression (>8 and ≥15).

Penn State Worry Questionnaire. The Penn State Worry Questionnaire (PSWQ) was developed by Meyer, Miller, Metzger, & Borkovec (1990) to measure the trait of pathological worry. Although it was originally developed for younger adults it has been shown to have a high internal consistency in older, community dwelling adults who have been diagnosed with generalised anxiety disorder *(*α= .88 - .91) (Hunt, Wisocki, & Yanko, 2003; Senior et al., 2007). It has moderate test-retest reliability in this population (0.54; Stanley et

al, 2001), and good concurrent reliability with the Generalized Anxiety Disorder Severity Scale (Sheer et al, 2006) ($r = 0.37$, $N = 134$, $p < 0.001$) (Andreescu et al, 2008). The PSWQ consists of 16 questions, each rated on a 5 point Likert scale. Depending on the point, each is scored from 1-5. Scores range from 16-80, with participants who score 23 meeting the criteria for GAD. For this thesis the continuous variable was transformed by the researcher into a dichotomous variable using the cutoff criteria of a score of 23 indicating that a person who scores 23 or higher meets the criteria for GAD (Wuthrich, Johnco, & Knight, 2014).

Standard Quantity Frequency Approach for alcohol consumption. The standard quantity frequency approach was used to classify participant alcohol consumption (Dawson, 2003). While there do not appear to be any studies on the validity or reliability of this approach, it is one of the most commonly used measures of alcohol consumption in Alcohol surveys in America (Dawson, 2003), and has also been used by ELSA (Lang et al, 2007). A potential limitation of this measure is the potential for under reporting of alcohol consumption (Stockwell et al, 2004).

There are no official guidelines for older adult alcohol consumption in Ireland apart from the advice to drink less (Alcohol Action Ireland, 2018). The recommended guidelines for male adults in Ireland are up to 17 standard drinks of alcohol over a week, and 11 standard drinks over a week for females (Health Service Executive, 2018). These remain unchanged since the adoption of the UK's guidelines in 1974 (Royal College of Physicians, 1987).

One of the few countries to set out guidelines for older adults is America. The American National Institute on Alcohol Abuse and Alcoholism's

(Niaaa.nih.gov., 2019) guidelines specify a weekly limit of 11 standard drinks for older adults, which, converted to Irish standard drinks, gives a weekly limit of 7 drinks. It was decided to retain the Irish guidelines for adults for this thesis for the following reasons. Ireland has a culture of heavy alcohol consumption (Ramstedt, & Hope, 2003), with one of the highest levels of alcohol consumption in the OECD (Mongan & Long, 2016), and, as Mongan and Long (2016) note, Irish older adults are not excluded from this culture of drinking.

The second reason for retaining the Irish guidelines was due to the pronounced sex differences in consumption. Men consume more than women, and this does not differ in older age groups (Moos et al, 2009). The Irish guidelines for the general adult population take this significant difference into consideration unlike the NIAAA's older adult guidelines. In addition, the Irish guidelines were used because the results of this thesis may inform policymakers and healthcare practitioners in Ireland. To measure past 12-month consumption three questions were asked as part of the Standard Quantity Frequency Approach (Dawson, 2003). Participants were asked if they had ever drank alcohol, or if they had ever drank in the last 12 months. Another question asked how often participants drank alcoholic drinks. A third question requested participants to fill in a checklist indicating "on the days that you drink, about how many drinks do you have?" They were provided pictures and descriptions of nine varieties of alcoholic drink including pints and half pints of lager/beer/cider, and large and small wine glasses. Alongside each type of drink were boxes indicating amounts that they drink in one day. The options were less than 1, 1-2, 3-4, 5-6, 7-8 and 8+. Responses to these questions were cleaned and converted into standard Irish drinks of 10 grams. Each category of

drink was then summed for each participant. Quantity of drinks was recoded into one of six categories, for example 1-2 drinks was recoded into 1.5 drinks, and 3-4 into 3.5. These were then multiplied by the responses to frequency of drinks per week.

For the current analysis, four categories of alcohol use were formed based on Irish alcohol consumption guidelines for males and females to describe participant's past 12 months' consumption: 1) Participants who had not drank alcohol within this time, 2a) male moderate drinkers who drank less than 17 drinks in a week, 2b) female moderate drinkers who drank less than 11 drinks in a week, 3a)male at-risk drinkers who drank more than 17 drinks in a week, 3b) females at-risk drinkers who drank more than 11 times a week. As a large number of the sample population in the TILDA database drank more than 17 drinks a week, a fourth category was created which was named harmful drinking. As Ireland does not have any thresholds for harmful drinking, the National Institute for Health and Care Excellence (NICE) criteria for harmful drinking was used. This specifies that that 50 or more units per week for males and 35 or more for females is harmful to physical and mental health (Drummond et al, 2011). Fifty units is 400 grams of alcohol, which equates to 40 standard drinks. Thirty-five units is 280 grams which equates to 28 drinks. For the current analysis the fifth category of drinking was harmful drinking, the threshold of which was set at 40 standard drinks for males and 28 standard drinks for females. Males and females were then combined into one ordinal variable with these four categories for their last 12 months' alcohol consumption: nondrinkers, moderate drinkers, at-risk drinkers, and harmful drinkers.

Participants in TILDA were also asked if they if they had reduced their consumption within the past two years. This variable was used as a control variable in the threshold depression regression, however due to it sharing a nondrinking category with the main alcohol variable, it was combined for this analysis. This resulted in seven categories. These were abstinence, moderate drinking that had not been reduced in the past two years, moderate drinking that had been reduced in the past two years, at-risk drinking that had not been reduced in the past two years, at-risk drinking that had been reduced in the past two years, harmful drinking that had not been reduced in the past two years, harmful drinking that had been reduced in the past two years.

Participants were also asked why they had reduced their consumption in the past two years. This latter variable was not used in any multivariate analysis.

Demographics. As part of the CAPI, participants were asked about their age, gender, level of education, marriage status, location of household, socio-economic level, household income, and employment (employed, not employed or retired). When data was either converted to categories or number of categories were reduced, the names of the derived categories are reflective of the original categories and are depicted in the appropriate tables in the results sections. Age was measured in categories, as was gender, marriage status, and current employment. For this thesis the following changes were made for the remaining demographic variables. Current household income was converted from a continuous variable to a categorical variable. Socio-economic level was reduced from seven categories to three, and level of education was also reduced to three categories. Marriage status was not reduced a

dichotomous variable available in the database was used to measure whether or not participants were married. The not being married category includes being widowed, separated, divorced, or never having been married.

Physical health related questions. Other health related questions asked were self-rated vision, self-rated hearing, self-rated physical health, disability status, sum of chronic illnesses, number of physical limitations, presence of an undetermined long-term illness, number of current medications, chronic pain, and current smoking. For this thesis the following changes were made. Self-rated vision was reduced from five categories to four, as were self-rated hearing, and self-rated physical health. Disability was reduced from four categories to two. The sum of chronic illnesses variable was developed by summing each listed chronic illness in the database. These were as follows: lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson's disease, Alzheimers, dementia, memory impairment, stomach ulcer, varicose ulcer, cirrhosis, high blood pressure, angina, heart attack, congestive heart failure, diabetes, ministroke, stroke, heart murmur, and abnormal heart rhythm.

Psychological health. In addition to the main dependent variables, further psychological questions were asked regarding whether the participant had been prescribed antidepressants, personality type, loneliness, cognitive status, social connectedness, and quality of life. These measurements are further detailed in table 6 along with others. Many of these questions, including the physical health related questions and demographics, were originally sourced from the ELSA, and SHARE, studies.

Table 6.
Independent variables which used scales embedded in the questionnaire

Title and authors	Measurement	Validity and reliability	Construct
The mini–mental state exam (MMSE). Folstein, Folstein, and McHugh (1975).	11 questions with a maximum of 30 points. For this thesis it was converted from a continuous variable into a categorical variable using the recognised cut off point of 25 which indicates increased odds of dementia (Folstein et al, 1975)	Satisfactory reliability (.68-.77), high test-retest reliability (.80-.95), and satisfactory to high construct validity (.68-.90) (Tombaugh & McIntyre, 1992).	Measures recall, language, attention, calculation, orientation to time and place, and visuospatial ability.
Index of independence in activities of daily living (Index of ADL). (Katz et al, 1963)	The Index of ADL Asks about difficulty with the following (dressing, walking across a room, bathing or showering, eating, such as cutting up your food, getting in our out of bed, using the toilet, including getting up or down).	Index of ADL Reliability is 0.94 (Hamrin, & Lindmark,1988). Concurrent validity: 0.95 (Hamrin & Wohlin, 1981). Questions from the Index of ADL in this thesis have been used in the SHARE study (Chan, Kasper, Brandt, & Pezzin, 2012) and ELSA (Netuveli, Wiggins, Hildon, Montgomery, & Blane, 2006).	Measures the treatment and prognosis of older adults and the chronically ill
Lawton Instrumental Activities of Daily Living (IADL). Lawton & Brody, 1969.	The Lawton IADL asks about difficulty with the following (Preparing a hot meal. Doing household chores. Shopping for groceries. Making telephone calls. Taking medications. Managing money, such as paying bills and keeping track of expenses). Responses to these tools were combined by TILDA to create one variable with four categories. These were not disabled, IADL disability, ADL disability and combined IADL and ADL disability. For the current analysis these were reduced into the dichotomous variable: disabled or not disabled.	Lawton IADL has an Internal consistency of 0.94, all correlation coefficients higher than 0.40 demonstrating good convergent validity. Construct validity with factor loadings of 0.76 to 0.90 (Vergara et al, 2012). The selection of questions from the IADL have also been used by the SHARE (Chan et al, 2012), ELSA (Netuveli et al, 2006), and the HRS (Cigolle et al, 2007).	Measures instrumental self-care among older adults

Table 6. (continued)

Number of functional impairments.	Participants were asked if they have difficulty with any of the following activities (walking 100 meters, Running/ jogging 1.5 kilometres (1 mile). Sitting for two hours, getting up from a chair after sitting for long periods. Climbing several flights of stairs without resting. Climbing one flight of stairs without resting. Stooping, kneeling, crouching, reaching or extending [your/his/her] arms above shoulder level. Pulling or pushing large objects like a living room chair. Lifting or carrying weights over 10 pounds/5 kilos, like a heavy bag of groceries. Picking up a small coin from a table). Number of functional impairments was a continuous variable with a scale of 0-11.	Little information available on this question's reliability and validity, however it has been used in the SHARE study (Chan et al, 2012), (ELSA) (Netuveli et al, 2006), and the Health and Retirement Study (HRS) (Cigolle et al, (2007), and is partly adapted from The Farmingham Disability Study (Jette & Branch, 1981).	Measure of the severity of functional impairment.
Social Network Index (SNI). Berkman & Syme, 1979.	12 multiple choice questions. The answers to these dichotomous questions are given 0 or 1, and totaled to give a scale range of scores of 0-4. A score of 0 identifies a participant as "most isolated" and a score of 4 indicates a participant is "most integrated." This was scored as a continuous variable.	The SNI is widely used (Fratigloini et al, 2000; Bennett et al, 2006). It is a self-report questionnaire with good validity and reliability (Berkman and Breslow, 1983)	Measures 12 types of social relationships (including marital, familial, religious, community relationships).
University of California-Los Angeles Loneliness Scale (UCLA). Russell et al, 1978.	Loneliness was an embedded scale within the SCQ. The database modified the University of California-Los Angeles Loneliness scale (Russell et al, 1980). This modified version had four negatively-worded questions and one positively-worded question. Responses were assigned a value of 0, 1 or 2. These were summed. The scale scores ranged from 0 (not lonely) to 10 (extremely lonely). This was measured using a continuous variable.	It has been used in the SHARE study (Malter et al, 2013) and the Tampere Study of Ageing (Jylha, 2004). Good internal consistency ranging from 0.89 to 0.94, (Russell, 1996). Test-retest reliability in adults aged 60+ is 0.73, with good construct validity (Russell, 1996).	Measures subjective feelings of loneliness and feelings of social isolation.

Table 6. (continued)

CASP-19. (control, autonomy, self-actualisation, and pleasure). Hyde et al, 2003.	Nineteen likert scaled items. Each of the four domains is measured in 4-5 items. Participants indicate how much they agree with each item on a 4-point scale ranging from 1 indicating "often" to 4 indicating "never". For 6 of the questions minus 1 was added to the score. The remaining 13 responses a minus 4 was added to the score, thus each response was assigned a score of 0-3. The total quality of life score for each participant was found by summing the scores for each item. The range of scores was 0-57, with a high score indicating a high quality of life. This thesis used the CASP-19 to measure quality of life in older adults in a scale variable.	It has been used in ELSA (Netuveli et al, 2006), and the SHARE study (Siegrist, et al, 2007). Cronbach's alpha's for the four CASP-19 domains range from 0.6-0.8. Correlations range from 0.4-0.7 (Hyde et al, 2003). In adults aged 65+, concurrent validity ranged from -0.273 in an ethnic population, and -0.577 in a randomly selected population. Construct validity ranged from −0.238, and −0.530 (Bowling & Stenner, 2011).	Measures a quality of life separate to factors that influence it such as health or income.
Neo Five Factor Personality Scale-3 (NEO FF-3) is a shortened version of the Revised Neo Personality Inventory (NEO PI-R) Costa and McCrae, 1989.	The shorter version (NEO FF-3) used in this thesis is a self-report scale of 60 items, each of which is answered in a Likert scale with five options ranging from "Strongly agree" to "Strongly disagree." There are 12 items per each of the five domains. High scores demonstrate a personality high in that domain. Each domain is regarded as a separate facet of the individual's personality. In this thesis, these were each measured as a continuous variable.	Internal consistency, ranges from 0.68 to 0.86 (Costa & McCrae, 1992). Test-retest reliability ranges between each domain from 0.66 to 0.80 (Robins et al, 2001). A number of studies have used it in the older adult population (Chapman et al, 2007), including the Baltimore Longitudinal Study of Ageing (Terracciano et al, 2005). This shorter version (NEO FF-3) was used most recently in the National Social Life, Health, and Aging Project (Iveniuk et al, 2014), and another large scale longitudinal studies (Roberts et al, 2006).	Measures five dimensions of personality: (neuroticism, extraversion, openness, agreeableness, and conscientiousness).
Smoking	Do you smoke at the present time? yes/no.	This question was also asked in ELSA (Banks, Breeze, Lessof, & Nazroo, 2008), and a slight variation of it was asked in the HRS (Østbye, Taylor, & Jung, 2002).	Whether participants currently smoke or do not.

ELSA= English Longitudinal Study of Ageing. HRS= Health and Retirement Study. SHARE= Survey of Ageing and Retirement in Europe.

Analysis Statistical analysis was performed using SPSS 23 (IBM Corp., 2015). Statistical significance was set as a *p* value of 0.05. Univariate analyses were performed on all variables. Means, frequencies and standard deviations were reported to describe the population. Bivariate analyses were used to test the primary relationships between the dependent and independent variables. Each dependent variable had 2 categories. Chi Square tests for independence were used to test the association of the dependent variable threshold depression with alcohol consumption, the dependent variable subthreshold depression with alcohol consumption, and the dependent variable GAD with alcohol consumption. To test the association of each dependent variable with the continuous independent variables, logistic regressions were used as not all independent variables were normally distributed. In these regressions, the Chi Square statistic was cited.

A test for inconsistent mediation as provided by MacKinnon, Krull, & Lockwood, (2000) was run in the bivariate test between threshold depression and alcohol consumption. When a relationship between an independent and dependent variable is mediated, the relationship between these variables, and their relation to the mediating variable will all be of the same sign i.e. either positive or negative. Inconsistent mediation differs from mediation in that not all of the relationships in the mediation model have the same sign. The most notable difference then is that in a mediated model the relationship between the independent and dependent variable will be significant in the absence of the third variable, whereas in an inconsistently mediated model this relationship may only be significant in the presence of the mediating variable (MacKinnon, Fairchild, & Fritz, 2007).

In this test the difference between two regression parameters ‘r-r1’ shows the effect of a third variable (self-rated health) where r=coefficient of the independent variable, and r1=the coefficient of the independent variable when the inconsistently mediating variable (self-rated health) is included in the regression.

Four logistic regression models were performed, one for subthreshold depression, another for threshold depression, one for GAD and one for comorbid threshold depression and GAD. In order for a logistic regression model to have adequate power Peduzzi, and colleagues (1996) recommend having a ratio of at least 10 events in the dependent variable to one independent variable. The formula to ascertain the minimum sample size is N= 10 k/p where k is the number of covariates, and p is the smallest proportion of positive or negative cases in the dependent variable. However, Courvoisier and colleagues (2011) and Vittinghoff and McCulloch (2006) state that Peduzzi’s guideline is overly conservative. Vittinghoff and McCulloch (2006) suggest that as low as 5 cases per independent variable can provide adequate power for a logistic regression with a binary dependent variable. Since almost a third of participants did not answer the alcohol questions (28%), and as listwise deletion is the default for missing data on logistic regression models in SPSS, this reduction of almost a third of the available participants made it difficult to follow Peduzzi et al (1996)’s guideline for each model.

In the GAD, and subthreshold depression, models Peduzzi, et al’s (1996) recommendation was met. A smaller number of participants met the criteria for threshold depression than subthreshold depression therefore

Vittinghoff and McCulloch's (2006) more relaxed guideline was met in the threshold depression, and comorbid GAD and threshold depression, models.

A logistic regression analysis was conducted to assess categories of alcohol consumption as predictors of threshold depression while controlling for identified covariates. A linear regression was used to test the independent variables for multicollinearity. This was measured according to the variance inflation factor (VIF). This assesses the degree that an increase in variance of the regression coefficient is due to collinearity. Location of household (VIF 62) was removed from the model due to multicollinearity. All remaining variables met the assumption for linearity. In addition to controlling for gender and age group, and cognitive status, the remaining model included those variables that reached significance in the bivariate analyses. Due to the number of bivariate analyses, a Bonferroni correction was applied to reduce the chance of a type 1 error. This resulted in a more stringent significance level of 0.001. This was the criteria for inclusion in the multivariate model. The variables, age, alcohol consumption, and the Mini Mental State Exam were included in the model due to their theoretical importance.

Covariates included in the model were marital status, socioeconomic category, long-term illness, number of medications, sum of chronic illness, number of physical impairments, self-rated health, self-rated hearing, self-rated vision, quality of life, neuroticism, extraversion, conscientiousness, agreeableness, loneliness, social connectedness, prescribed antidepressants, GAD, and smoking. The independent predictor of threshold depression was alcohol consumption combined with a variable for reduced alcohol consumption. Regarding sample size, the model had 23 variables, and the

proportion of people with threshold depression was .078. According to Vittinghoff and McCulloch's (2006)'s guidelines, a model with these figures requires a sample of 1,346. This model had a sample size of 1,364.

A logistic regression was also used to assess the categories of alcohol consumption as predictors of the dependent variable subthreshold depression while controlling for identified covariates. This model was chosen partly because subthreshold depression was measured as a categorical variable. It allowed for the association between this and alcohol consumption to be clearly identified, while controlling for the effects of predictors of subthreshold depression which have been previously identified from the literature. A linear regression was used to test the chosen independent variables for multicollinearity. Location of household, (VIF 70) was excluded due to multicollinearity. All variables met the assumption for linearity.

Due to the number of bivariate analyses, a Bonferroni correction was applied to reduce the chance of a type 1 error for this model. This resulted in a more stringent significance level of significance of 0.001. This level of significance was the main criteria for inclusion in the model. The variables employment, age, prescribed antidepressants, and smoking did not reach the new significance level of .001, but were retained due to their theoretical importance rather than their significance.

Covariates included in the model were gender, age, employment status, marriage status, education, household income, smoking, number of impairments, smoking, disability, long-term illness, self-rated hearing, self-rated vision and self-rated physical health, number of medications, chronic physical health condition, quality of life, Penn worry scale, loneliness, social

connectedness, neuroticism, extraversion, and conscientiousness, Mini Mental State exam, prescribed antidepressants. The independent predictor of subthreshold depression was alcohol consumption. Regarding sample size, the model had 25 variables, and the proportion of people with subthreshold depression was .19. According to Peduzzi and colleagues (1996)'s guideline a model with these figures would require a sample of 1,263. This model had a sample size of 1552.

A logistic regression analysis was also used to assess the association of GAD with alcohol consumption. A linear regression was used to test the chosen independent variables for multicollinearity. removed A Box Tidell test was conducted to test for linearity. Extraversion, number of physical impairments, and CASP19 were not linearly relate to the logit of the dependent variable. Extraversion was excluded as was number of physical impairments. The variable measuring quality of life, CASP19, was converted into its square root to improve its linearity. This improved its linearity and so CASP19 was retained in the model. Transforming the variable in this way, improved its normality.

Covariates included in the model were age, gender, socio-economic status, education status, household income, marriage status, employment status, self-rated health, self-rated vision, self-rated hearing, disability, number of medications, sum of chronic illness, long-term illness, Mini Mental State Exam, chronic pain, quality of life, agreeableness, conscientiousness, neuroticism, social connectedness, loneliness, threshold and subthreshold depression, and quality of life. The independent predictor was alcohol consumption. Regarding the sample size, the model had 24 variables, and the

proportion of people with GAD was .19. This met Peduzzi et al (1996)'s guidelines which require a sample of 1,105. This model had a sample size of 1600.

A final logistic regression was conducted on the variable comorbid GAD and threshold depression. This variable was created by combining the GAD and threshold depression variables. Before running a logistic regression for co-occurring GAD and threshold depression, the independent variables were tested for multicollinearity and linearity. Self-rated vision (VIF 145.5) and Location of house (VIF 70.51) were removed from the model. As only 106 participants had both GAD and threshold depression, the model could not accommodate all the significant bivariates. The model was therefore constructed using the significant findings from both the GAD regression and the threshold depression regression.

Covariates included in this model were age, household income, self-rated hearing, disability, number of impairments, extraversion, neuroticism, conscientiousness, loneliness, quality of life, and social connectedness. Regarding sample size, the model included 9 variables, and the proportion of people with comorbid GAD and depression was .03. According to the guidelines of Vittinghoff and McCulloch's (2006)'s, a model with these figures, requires a sample of 1,346. This model had a sample size of 1,917.

Phase one Ethics The quantitative phase of this thesis has directly gained ethical approval from the Faculty of Health Sciences Ethics Committee Trinity College Dublin. The dataset used in the quantitative phase of this thesis was collected for the second wave of the TILDA study. TILDA secured ethical approval from the Trinity College Research Ethics Committee to collect, store and analyse this data which was anonymised before it was made available for analysis. Participants for the TILDA study signed separate consent forms, which included a statement on their information remaining confidential, prior to participating in the study. TILDA Participants were also informed that they would be contacted for future waves of the TILDA study, and that their data may be made available to other researchers.

Phase Two

The qualitative analyses focused on the following objectives: (1) To explore the perspectives and beliefs of health practitioners regarding their professional experience of older adult mental health and alcohol consumption. (2) To explore the health practitioner's perceptions of the role of alcohol consumption in older adult depression.

Analysis

The design, or methodology, of this phase was qualitative descriptive. The aim of qualitative descriptive design is a descriptive account of what the participants "think and believe, that most participants would agree was an accurate one." (p. 257, Green & Thorogood, 2018). This is a form of research that is not attached to any specific philosophical framework, the result of which is that it allows the researcher to remain closer to the data than more theoretical approaches such as grounded theory, ethnographic or narrative studies

(Sandelowski, 2000). A systematic review of studies using qualitative descriptive designs found few researchers specify theoretical frameworks (Kim, Sefcik, & Bradway, 2017). However, this is not to say that it is atheoretical, or that it does not entail interpretation of the collected data. Rather it means that if the data leads in an unexpected direction, the researcher is not tied to one theory and so can follow it (Sandelowski, 2010). Common analytic methods within the qualitative descriptive design are thematic analysis and content analysis (Doyle et al, 2019). The former was used to analyse the collected data in this study. This was chosen for its flexibility and suitability for exploring participant's experiences and perspectives (Braun & Clarke, 2006).

Participants The first phase of the thesis analysed data from The Longitudinal Study of Ageing in Ireland (TILDA). Creswell and Plano Clark (2011) recommend that the qualitative participants in a sequential explanatory study should be the same as the quantitative participants, as they are being used to explore the quantitative findings. In line with TILDA's ethical approval, participants' identities were protected. Their consent specifically prohibited their names been released for further studies. Although this is not ideal, it is a common issue when secondary data from a large study is quantitatively analysed in a mixed methods study (Leahey, 2007). Due to this inability to follow up with the original participants, it was necessary to source participants independently of TILDA. Purposeful sampling was used. The initial objective was to interview older adults themselves.

Mirroring the criteria for the quantitative arm of the study, criteria for recruitment was being aged 65 or older, and dwelling in the community in

Ireland. In addition, the following criteria were applied: having a diagnosis of GAD and/or depression, and having consumed alcohol within the last year. The TILDA study's sample was nationally representative. By applying these criteria, it was believed that the participants of the qualitative phase, while not being the original TILDA participants, came from the same population sample.

In order to ensure that the participants had received a diagnosis of either GAD and/or depression, it was decided to recruit participants from psychiatric outpatient facilities. The Clinical Director, of a Mental Health Service, acted as the initial gatekeeper for this phase. The director was not a provider of care for the participants. The gatekeeper contacted psychiatrists working in the same service who screened their patients for eligible candidates. This list was then given to their secretaries, who acted as secondary gatekeepers and provided copies of a participant information leaflet to prospective participants. These participants were patients, identified primarily according to their diagnoses of either generalised anxiety disorder, depression, or subthreshold depression. The participant information leaflet included the researcher's details for patients to contact if they wish to take part in the study. Following patients contacting the researcher interviews were arranged after a minimum period of seven days.

Despite the best efforts of myself and the study gatekeeper, there proved to be a small number of older adults available who fit the inclusion criteria. In an effort to recruit a sufficient number of participants ethics approval was sought expand the recruitment process. Once approved, a large number of services for older adults were contacted. These agreed to assist in

recruitment and advertised the study on social media and other channels, but to no avail.

It was decided to interview psychiatrists and general practitioners (GPs) who had professional experience with older adults who had depression and/or anxiety and who had a history of consuming alcohol. All were based in Ireland, so as to match the TILDA sample. The main recruitment method was purposive sampling. Snowballing was a secondary method.

One of the strengths of interviewing health practitioners is that, due to their professional experience, they are able to provide more information and, as a result of their experience with a variety of patients, may be able to provide deeper insights into the relationship between mental health and older adult alcohol consumption (Marshall, 1996). A potential disadvantage is that they may not relay politically unacceptable insights as the participants are aware that they are representatives of their organisation (Marshall, 1996), however this did not appear to be an issue with this topic. Another benefit to interviewing key informants is that they can act as a translator for their culture, highlighting aspects which the researcher may not have appreciated as being significant (Gilchrist and Williams, 1999). I experienced this when interviewing them. In addition to purposive sampling, I encouraged snowballing.

Inclusion criteria. The participants were required to have professional experience with patients who were resident in the community in Ireland and who were

- Aged above 65 or above
- Diagnosed with either depression or generalised anxiety disorder.

- Have a history of consuming alcohol, whether moderate or drinking over the recommended guidelines.

Exclusion criteria: do not have professional experience of patients who were resident in the community in Ireland who were

- Aged above 65 or above
- Diagnosed with either depression or generalised anxiety disorder.
- Have a history of consuming alcohol, whether moderate or drinking over the recommended guidelines.

Sample size. Purposive qualitative samples in qualitative research have found saturation at as low as 12 interviews (Guest, Bunce, & Johnson, 2006). An analysis of qualitative Ph.D. samples found a range from 10 to 40 (Mason, 2010). Based on these prior studies, and taking into account the less dominant nature of the qualitative phase in this thesis, it was initially expected that a sample size of 10 would be adequate. There was an initial exploration into using only patients as participants, however, it proved difficult to source a sufficient number of participants.

In total, five psychiatrists, four GPs, and one alcohol liaison nurse were interviewed. These were chosen to represent perceptions of older adult mental health and alcohol consumption at primary and secondary levels of healthcare. Participants were chosen from these two levels so as to gain more nuanced data then if they had been chosen from either primary or secondary level. Participant ages ranged from 38 to 67. Ten interviews were conducted. Of these, four interviewees were women and six were men. Data saturation was reached when further coding was no longer possible (Guest el at, 2006). This was closely monitored for during data collection.

Recruitment. The same clinical director of a mental health service who acted as a gatekeeper for the initial recruitment drive of this thesis remained the gatekeeper for this new recruitment drive. The gatekeeper forwarded an email I had written as an introduction to the study, and which had an information sheet attached, to psychiatrists working in the North Dublin region. Those psychiatrists interested in participating me replied to my email. After ensuring that they fit the inclusion criteria, I arranged to interview them after a minimum period of seven days following their initial contact with me.

I recruited GPs throughout the North Dublin region through their surgeries by phone. I followed this initial contact up with an email which had the information sheet attached. Those interested in participating responded and, after ensuring that they fit the inclusion criteria, I arranged to interview them after a minimum period of seven days following their initial contact with me. Informed consent was gained before the interviews were conducted.

Phase two Ethics The qualitative phase gained ethical approval from the Faculty of Health Sciences Ethics Committee T.C.D., and Beaumont Hospital's Research Ethics Committee. I also received Garda clearance. This is a mandatory form of vetting for people working with children or vulnerable populations in Ireland. It is conducted by the Irish police force's National Vetting Bureau. Potential participants were provided with an information leaflet detailing what would be required of them, how the thesis might affect them, and that they were not obliged to continue with the interview if they felt in any way uncomfortable. Following initial contact, interviews were arranged after a minimum period of seven days. On meeting each participant I provided them with a consent form.

King and Horrocks (2010) suggests that for participants to give their informed consent, they must be informed of the purpose of the research, the reason they were chosen to participate, the voluntary and non-obligatory nature of their participation, and what they will be required to do. The consent form reiterated the details of what would be required of them during the interview, and informed the interviewees that participation was voluntary, that they could discontinue at any point, and that their participation or nonparticipation would not affect their relationship with their institution. The previously provided information sheet informed them why they were chosen for the thesis i.e. they fit the listed criteria.

The consent form also informed the interviewees that their data was anonymised, and that their name would not be published or disclosed to anyone outside of the thesis group, but that parts of their anonymized responses may be published in articles and presented at conferences. This is in line with the

Psychological Society of Ireland's Code of Professional Ethics (2010). There were no adverse reactions during or after the conducted interviews.

As the interviews included sensitive information, the following steps were taken to anonymise the responses. Pseudonyms were used to replace real names. The key containing the pseudo and real names was stored along with the transcript of the interviews in a password protected computer. The transcript was further anonymised by replacing any other identifying features mentioned such as names of friends or relatives, or geographical landmarks with pseudonyms.

The recording of the interviews was stored in a secure place. Following the change of data collection and data storage regulations in 2018 changes had to be applied particularly with regard to the retention and storage of the personnel data of the participants. The only personal data collected were names and contact details to contact the participants and personal details in the consent forms. The contact details data have been stored on an encrypted password protected computer. The consent forms are stored in a secure location. Both sets of data will be retained for seven years as recommended by the Trinity Faculty of Health Sciences Research Ethics Committee.

The audio recordings were destroyed by the principal researcher after they had been transcribed and analysed. The principal researcher will destroy the personal data after a period of seven years. This will include the codes. Soft copies of the transcripts which by that stage will be irrevocably anonymised will be retained. These will be stored in a secure location after the study in accordance with best international practice. Hard copy records will be stored in a locked filing cabinet. Soft copy records will be stored on the principal

researcher's work laptop protected by password. These will be retained for the purposes of future publication.

Data collection Semi-structured interviews were used to collect the qualitative data. A semi-structured interview is essentially a conversation between the interviewer and the interviewee organized around a predetermined list of open ended questions, with the main difference between an interview and a conversation being that the interview is controlled by the interviewer (Flynn, 2005). The semi-structured interview was chosen for this thesis because it allows the researcher to delve into the participant's thoughts and perceptions of personal and often complex issues, (DiCicco-Bloom & Crabtree, 2006), while allowing for probing and the clarification of answers (Barriball, & While, 1994).

Each participant was interviewed once. The interviews took place between the dates of the 25th of October to the 29th of December 2018. These were conducted in locations suited to the interviewees; all but two took place in their office. The remaining two took place in quiet cafes in areas that were not local to their place of work. The time for each interview ranged from 30 minutes to an hour. The interviews were conducted using open ended, semi-structured questions which were designed to explore the experiences, values, thoughts and feelings of participants on their older patient's mental health and alcohol consumption and their professional role in diagnosing and treating them. An interview guide was created prior to interviewing to facilitate this (appendix 4). The open ended nature of the questions provided space for the participants to relay their answers in their own words, providing an in-depth understanding of their personal context. They also offered the opportunity for

clarification on behalf of both the interviewer and the interviewee, which led to greater understanding, and allowed for the exploration of topics that might be considered too sensitive for a focus group. The main objectives of the interviews were to explore the participant's experiences and beliefs regarding their patient's depression and anxiety, how alcohol might relate to this, and what aspects of older adulthood might effect this relationship. The questions were developed based primarily on the findings of the quantitative analysis, but also on the literature review. All participants consented to their interview being recorded using a digital recording device.

Analysis The data were initially analysed using Thematic Analysis, and were later presented together with the quantitative analysis using a joint display (O'Cathain, Murphy, & Nicholl, 2010). This latter analysis is discussed toward the end of this chapter. There are a number of ways to conduct thematic analysis,

Braun & Clarke (2006) set out six steps of thematic analysis. Familiarisation with the data, coding, searching for themes, review of themes, analysis of themes, and write up. These do not necessarily follow in a sequential manner. The process is reflexive, and depends mostly on the data. Familiarisation was the first step in this analysis. This entailed listening to the interviews and transcribing them on the day they were recorded, or the following day. During transcription, notes were taken regarding potential codes and themes. Once the interviews had been conducted and transcribed, I proofread the collected data while listening to the interviews. By this stage I was quite familiar with the data. The process of transcribing the interviews

helped in this. Familiarisation can be seen as the first stage of analyzing the data (Langdridge & Hagger-Johnson, 2009).

The transcriptions were read through as I searched for meanings, patterns, and potential themes. The transcriptions were printed and read through again. During this time the first cycle of coding began. This is the second step of thematic analysis, where labels for passages of the data marking what seemed like important commonalities between participants were generated. The coding was a combination of inductive and deductive coding. Inductive coding was driven by the data and its contents while deductive coding was driven by what I the researcher brought to the analysis, such as prior ideas or theories, or, in this case, the objectives to explore the perspectives and beliefs of health practitioners regarding their professional experience of older adult mental health and alcohol consumption, and the role of alcohol consumption in older adult depression. As the thesis design was sequential explanatory, deductive coding was the dominant mode during this step.

First cycle coding consists of initial codes being used to label the data. There are a number of different methods of coding that can be used at this stage of analysis. A combination of simultaneous, structural, descriptive, and In Vivo coding were used at this point (Saldaña, 2015), where I highlighted passages and assigned codes to them. Simultaneous coding took place when certain passages appeared to have more than one meaning; in these cases, more than one code was attributed to them. When passages were immediately relevant to the thesis' objectives structural coding was used. At times descriptive coding was used when parts of the data were coded with a single

word describing them. In Vivo coding places emphasis on the interviewee's own words as codes. In this analysis quotes were used to code the more impactful phrases used by the participants. Throughout this cycle notes were made and possible code categories emerged from the development of the codes themselves.

The second cycle of coding was a refinement of the first. This included rereading the data, combining similar codes, relabeling, dividing codes, and deleting others. The next step of the analysis was the organising of the codes into categories. This was done by printing out the list of codes, cutting them into single pieces of paper and arranging them on a table top until similarities could be discerned between them. These similarities were developed into categories and given names. This is a higher level of coding where the codes are categorised, and assessed for thematic relevance. These were then typed up in a table representing each category with its codes. Throughout this process. the codes were continually assessed for relevance.

The categories were then analysed for themes. This was a gradual process. I searched for similarities between categories while referring back to the transcripts, and mapped how the categories related to each other. While doing this I kept the thesis' objectives in mind. Themeing of the data is the third of Braun & Clarke's (2006) steps. Four potential themes were recognised and developed.

In the fourth step these themes were reviewed. They were evaluated and each themes nature was defined. These were then organised to see how they fit together to tell the story of the data through the creation of a thematic map of the analysis. During this two of the themes were found to be more like

categories than themes. In addition, codes from each were developing between the other two themes. These were collapsed and their codes and the few categories that led to them were shared between the two final themes. These were named, and in step five they were further defined, and analysed. Representative extracts were selected for each theme. These were pasted into a word document and rearranged until they formed a coherent narrative. From this process three subthemes were developed from each of the two main themes. The final step was the writing up of the analysis. In the writing of the analytic report, I interpreted the extracts to create a thematic narrative, illustrating these themes, which told the story of the data and in the process of doing so explained the more interesting findings of the quantitative analysis. A relationship between the two themes was also developed.

Rigor and trustworthiness The topic of validity and reliability in qualitative research is a contested one (Leung, 2015), with many believing these criteria to be more suited to quantitative research (Agar 1986). Rather than using these terms Lincoln & Guba, (1985), substituted alternative criteria for qualitative research. Credibility rather than internal validity. Transferability rather than external validity. Dependability instead of reliability, and confirmability instead of objectivity.

Credibility refers to the truth value of the findings, in other words that the researcher has represented the participants and their data truthfully. Methods of ensuring this are persistent observation and the use of direct quotes from the participants which provided supporting evidence of the findings. Persistent observation was achieved through steps that are detailed in the analysis. To provide a brief overview, it was achieved through the researcher

conducting the interviews, transcribing them, developing codes, categories and themes, and rereading the interview transcripts a number of times. The data was studied to the extent that analysis was carried out at a deep level of understanding.

Transferability refers to how easily the findings be transferred to another context. Shenton (2004) notes that the boundaries of the study must be made clear, such as the organisations taking part in the study, any restrictions on the participants, the number of participants, data collection methods used, number and length of data collection sessions, and the time period over which the data was collected. These are noted in the sections above. Ultimately the reader decides whether this transferability have been achieved. Dependability refers to the consistency of the study over time. The way to ensure that this has been achieved is through careful and transparent documentation of the methodology, and research process. This is also called providing an audit trail. The researcher's supervisors ensured that the decisions made and methods used in each stage of the research were consistent and dependable. The supervisors also read through the interview transcripts during the analysis to ensure that the codes, categories and themes being developed were reflective of the data.

Confirmability is the last of Guba and Lincoln's (1985) criteria for qualitative trustworthiness. This refers to realistic quality of the results, whether they reflect the data and other findings in the research literature, and can be confirmable by other independent observers or are more reflective of the researcher's imagination. As with dependability, an audit trail is a useful method for ensuring confirmability (Korstjen & Moser, 2018).

Additionally, to test the quality of the interview guide, and to identify any potential researcher bias, two pilot interviews were conducted, one with a psychiatrist and one with a GP. Feedback was requested after each interview. Both interviewees were happy with the number and quality of the questions. After personal reflection, and discussion with the researcher's supervisors, two refinements were made: a question was added asking about the role of loneliness in depression, and another asking how GPs and psychiatrists could better diagnose older adult depression in the future.

Quality in mixed methods research O'Cathain, Murphy, and Nicholl (2008) note that transparency is a necessary means of assessing the quality of mixed methods research. The authors developed guidelines regarding transparency in 6 aspects of mixed methods studies. These were: justification for mixing methods; the priority and sequencing of the methods; the description of each aspect of the methods; where and how integration between the methods occurred; the limitations of the methods in relation to each other; and insights gained from using mixed methods. The first 5 of these were addressed in the beginning of this chapter. Insights gained from using a mixed methods design were addressed in the discussion chapter.

Merging of the analyses from Phase one and two

A mixed methods joint display (O'Cathain et al, 2010) was used to integrate the results from phase one and phase two. This was done using what is called a themes by statistics design which is one of the more commonly used methods of integrating quantitative and qualitative findings in mixed methods research (Guetterman et al, 2015). A display was created with three columns. In the first column, quantitative findings explored in the qualitative analysis

were displayed. The second column displayed extracts representing the themes most closely related to these statistical findings. In a third column meta-inferences were made. These inferences combined the findings of each analysis. Following Guetterman and colleagues' (2015) guidelines, headings were used to designate the quantitative, qualitative, and inference columns for ease of reading. The design of the joint display was consistent with the mixed - methods design and integration approach used in this thesis. One of the benefits of using a joint display was the ability to increase integration at the level of interpretation and reporting (Fetters, Curry, & Creswell, 2013) in this thesis, and in doing so develop new insights from the integration of the findings. The integration of the findings will be further discussed in the discussion chapter.

Conclusion

This chapter discussed the philosophical and practical rationale for choosing a sequential explanatory mixed methods design in this thesis. The strengths and limitations of quantitative and qualitative designs were examined in relation to the research question, and the methodological aspects of phase one and phase two, and their integration, were detailed.

Chapter Five: Quantitative Results

This chapter presents the quantitative findings. The aim of this study was to determine and explain the associations of three aspects of mental health in older adults: threshold depression; subthreshold depression; and GAD, with alcohol consumption, and the factors influencing these associations. Using a mixed methods design, this was achieved using quantitative and qualitative analysis. The findings of the quantitative analysis inform the objectives of the qualitative analysis as is consistent with an explanatory sequential mixed methods design. The two analyses were then integrated and discussed. The following chapter presents results from the quantitative analysis. The three objectives for this section were to determine the association between threshold depression and alcohol consumption, the association between subthreshold depression and alcohol consumption, and the association between GAD and alcohol consumption. In each of these determinations factors identified from the literature were controlled for.

Univariate Analyses

This data was collected between February 2012 and March 2013 in the second wave of The Irish Longitudinal Study of Ageing (TILDA). The sample for the quantitative analyses in this study was comprised of 3455 participants aged 65 and over. Of the 3,455 participants, 47% were male and 53% were female. Participant's ages ranged from 65 to 97 years with a median of 72, and a mean of 73.58 (SD 6.6). The majority of participants were aged 65-74 (61%) (table 7).

More than half of the sample were married (61%), as opposed to being either widowed, divorced, separated or never having married. and the majority were unemployed, or retired (90%), with 56% classified as having been, or currently being, non-manual workers. Regarding educational attainment, 40% of participants stopped their formal education at primary level, while 33.9% of participants gained a secondary level education; 25.7% participants went on to third level (table 7).

Table 7.
Demographic characteristics of the study participants
(n=3455 unless otherwise indicated)

Variable	Participants N (%)
Gender	
Male	1619 (46.9)
Female	1836 (53.1)
Age	
65-75	2111 (61.1)
75+	1344 (38.9)
Location of Household (n=3441)	
Dublin	846 (24.5)
Another town or city	1006 (29.5)
A rural area	1589 (46.2)
Marital status	
Married	2095 (60.6)
Widowed/ divorced/ separated/ single	1360 (39.4)
Employed	
Employed	3095 (9.6)
Not employed/ retired	330 (90.4)
Household income (n=3064)	
0-€18,000	1054 (34.4)
€18,000-€27,000	729 (23.8)
€27,000-€50,000	921 (30.1)
€50,000 +	360 (11.7)
Socioeconomic class (n=3330)	
Non-manual	1944 (56.3)
Manual	1162 (34.9)
Never worked	224 (6.7)

Education (n=3449)	
None/ Primary	1393 (40.4)
Secondary	1169 (33.9)
Tertiary	887 (25.7)

A high percentage of participants scored as having generalised anxiety disorder (GAD) (18%) based on responses to the Penn Worry scale (table 8). Scores on the Centre for Epidemiological Studies Depression Scale indicated that 16% of participants had subthreshold levels of depression and 7% had threshold levels of depression. Only 3% of participants reported taking antidepressant medication. In terms of social isolation and integration, a majority of participants (41%) were moderately integrated in their community (table 8).

Table 8.
Psychological characteristics of the study participants (n=3455 unless otherwise indicated)

Variable	Participants Mean±SD
NEO Personality Inventory Conscientiousness (n=2574)	32.9 ± 5.2
NEO Personality Inventory Agreeableness (n=2576)	33.7 ± 5.0
NEO Personality Inventory Extraversion (n=2574)	27.6 ± 5.2
NEO Personality Inventory Neuroticism (2=2571)	18.1 ± 6.9
NEO Personality Inventory Openness (n=2553)	27 ± 5.6
Quality of life CASP-19 (n=2509)	43.2 ± 7.8
Loneliness scale (n=2792)	1.9 ± 2.1
Variable	**Participants N (%)**
GAD (Penn Worry scale) (n=2584)	
Worry	464 (18)
No worry	2120 (82)
Centre for Epidemiological Studies Depression Scale (n=3310)	
None/ mild	2531(76.5)
Sub threshold depression	537 (16.2)
Threshold depression	242 (7.3)
Centre for Epidemiological Studies Depression Scale Threshold depression (n=2773)	
No depression	2531 (91.3)
Threshold depression	242 (8.7)
Centre for Epidemiological Studies Depression Scale Subthreshold depression (n=3068)	
No depression	2531 (82.5)
Subthreshold depression	537 (17.5)
Comorbid worry and threshold (n=2544)	
Depression	106 (4.2)
No comorbidity	2438 (95.8)
Response to Depression questions	
No response	145 (4.2)
Response	3310 (95.8)
Prescribed antidepressant	
Yes	112 (3.2)
No	3342 (96.8)

Social connectedness (n=2887)	
0-1 Most isolated	183 (6.3)
2 Moderately isolated	845 (29.30
3 Moderately integrated	1177 (40.8)
4 Most integrated	682 (23.6)

CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. NEO= Neuroticism, Extraversion, Openness Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct. Mean and standard deviation provided for continuous variables, and percentages are provided for categorical variables.

Almost a third of the sample (28%), did not complete questions regarding their alcohol consumption. Among those who did, the largest category of consumption was moderate drinking with 48% of participants in this category (table 9). More than a quarter of the sample (29%) reported abstinence from alcohol. The third largest category, with 16% of the sample, was at-risk drinking, and the smallest category was made up of harmful drinkers at 7% (table 9). Using another variable of self-reported alcohol consumption, more than a quarter of the sample (29%) reported having reduced their alcohol consumption in the past two years, while more participants (44%) did not reduce their consumption. The most common reasoning given for having reduced their alcohol consumption was “personal choice” with 19% of the sample stating this.

Regarding physical health, 28% had one chronic illness, while 45% of participants reported having more than one chronic illness. When asked if they had a long-term illness and whether it was limiting or not, 31% reported having a limiting long-term illness. A minority of participants, 16% were disabled. The prevalence of current smoking was 13% (table 9).

Table 9.
Physical health characteristics of the study participants (N=3455 unless otherwise indicated)

Variable	Participants N (%)
Alcohol consumption (n=2964)	
Abstinence	730 (29.2)
Moderate drinking	1211 (48.5)
At-risk drinking	394 (15.8)
Harmful drinking	161 (6.5)
Reduced alcohol in past two years	
Abstinent	730 (27.1)
Didn't reduce	1192 (44.2)
Reduced	773 (28.7)
Why did you reduce your alcohol consumption?	
Abstinent	730 (27.8)
Personal choice	507 (19.3)
Doctor's advice	42 (1.6)
Medication	105 (4)
Illness or health	51 (1.9)
Didn't reduce	1192 (45.4)
Answered alcohol questions	
Yes	2496 (72)
No	959 (27.8)
Alcohol use combined with reduced drinking within past two years	
Abstinence	730 (29.9)
Moderate-didn't reduce	755 (30.9)
Moderate-reduced drinking	412 (16.9)
At-risk-didn't reduce	196 (8)
At-risk-reduced drinking	191 (7.8)
Harmful drinking-didn't reduce	77 (3.2)
Harmful drinking-reduced drinking	81 (3.3)
Current Smoking (n=1868)	
Currently smoke	428 (12.6)
Don't smoke	2962 (87.4)
Disability	
Disabled	569 (16.5)
Not disabled	2886 (83.5)
Chronic health conditions	
None	932 (27)
One condition	973 (28.2)
More than one condition	1550 (44.9)
Long-term illness (n=3454)	
No Long-term illness	1750 (50.7)

Long-term illness	639 (18.5)
Limiting long-term illness	1065 (30.8)

Table 9. (continued)

Variable	Participants N (%)
Self-rated hearing (n=3379)	
Excellent	476 (14.1)
Very good	911 (27)
Good	1278 (37.8)
Fair to Poor	714 (21.1)
Five or more medications (n=3451)	
Yes	1447 (41.9)
No	2004 (58.1)
Self-rated health (n=3379)	
Good	1238 (36.6)
Very good	972 (28.8)
Fair to Poor	780 (23.1)
Excellent	389 (11.5)
Self-rated vision (n=3378)	
Excellent	443 (12.8)
Very good	1110 (32.1)
Good	1363 (39.5)
Fair / Poor/ blind	462 (13.7)
Mini Mental State Exam (n=3388)	
Increased odds of dementia	255 (6.6)
Decreased odds of dementia	3163 (93.4)
Variable	Participants Mean±SD
Number of Functional impairments	2.88 ± 2.50

All continuous variables are scaled with higher numbers being more representative of the measured construct.

Threshold depression

Bivariates. Bivariate analyses were run for threshold depression with the selected independent variables for inclusion in the multivariate analyses. The sociodemographic independent variables were age, gender, social class, marital status, education, location of household, current employment, and household income (table 10). The psychological health variables were quality

of life, Penn worry measure for GAD, antidepressant use, social connectedness, conscientiousness, neuroticism, extraversion, openness, agreeableness, loneliness (table 11). The physical health variables were alcohol use, reduced alcohol consumption, reasons for reducing alcohol consumption, smoking, number of functional impairments, disability status, long-term illness, chronic physical health condition, self-rated vision, self-rated hearing, self-rated health, prescribed five or more medications, and Mini Mental State Exam score (table 12). In all, 34 variables were analysed. Two of these, such as reasons for reducing alcohol consumption, and whether or not participants completed the alcohol questions were analysed for exploratory reasons, the rest were analysed for an association with threshold depression (tables 10-12) for the purpose of fitting the multivariate models. Of these analyses, the vast majority of independent variables had significant associations.

Females were more likely than males to have threshold depression (63%). There was no significant association between age and threshold depression. Slightly more participants with threshold depression (51%) were currently not married compared to being widowed/ divorced/ separated/ single (table 10). Those with threshold depression were more likely to have stopped their education after primary level (54%) than any other level. At 94%, current unemployment was the more common employment status among those with threshold depression. In terms of socioeconomic class, those who worked or who had worked in manual labour had the highest percentage of threshold depression (47%), as did those with lowest household income level (43%) (table 10).

Table 10.
Bivariate analyses between sociodemographic variables and threshold depression

Variable	No depression (n=2531) N (%)	Threshold depression (n=242) N (%)	χ^2
Age			.13‡
65-75	1594 (63)	149 (61.6)	
75+	937 (37)	93 (38.4)	
Gender			14.09***‡
Male	1256(49.6)†	89 (36.8)	
Female	1275 (50.4)	153 (63.2)†	
Social Class			15.9***
Non manual	1479(60.7)†	112 (47.3)	
Manual	813 (33.4)	106 (44.7)†	
Never worked	143 (5.9)	19 (8)	
Marital status			17.4***‡
Married	1644(65)†	124 (48.8)	
Widowed/ divorced/ separated/ single	887 (35)	188 (51.2) †	
Education			26.4***
Primary/None	960 (38)	132 (54.5)†	
Secondary	890 (35.2)	56 (23.1)	
Tertiary	675 (26.7)	54 (22.3)	
Location of household			7.5*
Dublin city	567 (22.9)	74 (30.7)†	
Another town/city	746 (29.6)	64 (26.6)	
Rural area	1198 (47.5)†	103 (42.7)	
Current employment			9.27**‡
Employed	281(11.2)†	11 (4.6)	
Not employed/ retired	2232 (88.8)	228 (95.4)†	
Household income (n=3068)			17.1***
0-€18,000	691 (30.7)	90 (43.1)†	
€18,001-€27,000	558 (24.8)	51 (24.4)	
€27,001-€50,000	695 (30.9)	53 (25.4	
€50,001 +	305 (13.6)	15 (7.2)	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0.

‡Yates Continuity Correction applied.

Compared to those with no threshold depression, participants with threshold depression had reported a poorer quality of life (χ^2 (1)266.58, p<.001) and higher levels of loneliness (χ^2 (1)283.7, p<.001) (table 11). The personality profile of these showed they had higher levels of neuroticism, and lower levels of extraversion, agreeableness, openness and conscientiousness. Only 8% were found to be prescribed antidepressant medication. The majority of those with threshold depression also had GAD (62%) (table 11).

Table 11.
Bivariate analyses between psychological variables and threshold depression

Variable	No depression (n=2531) N (%)	Threshold depression (n=242) N (%)	χ^2
Quality of life (CASP19) (n=2089)			266.58***
Generalised Anxiety Disorder (Penn Worry scale)			304.4***‡
No worry	1759 (88.6)†	65 (38)	
Worry	227 (11.4)	106 (62)†	
Prescribed antidepressant			288.04***‡
No	2467 (97.5)	222 (91.7)	
Yes	64 (2.5)	20 (8.3)†	
Social Connectedness			45.4***
Most isolated	114 (5.2)	21 (11.4)†	
Most integrated	706 (32)	65 (35.1)†	
Moderately integrated	922 (41.7)	74 (40)	
Moderately isolated	467 (21.1)†	25 (13.5)	
Conscientiousness (n=2142)			39.29***.
Neuroticism (n=2143)			370.90***
Extraversion (n=2145)			107.17***
Openness (n=2127)			1.43
Agreeableness (n=2145)			7.41**
Loneliness (CASP) (n=2323)			283.7***

*p< .05. **p< .01. ***p < .001. † adjusted standardised residual was more than +2.0**.** ‡Yates Continuity Correction applied. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. Neuroticism, Conscientiousness, Extraversion, Openness, and Agreeableness from NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct.

The self-rated health of those with threshold depression, compared to those with no depression was most likely to be poor to fair (63%). Participants with threshold depression were most likely to have a limiting long-term illness than not (61%), and to have more than once chronic health condition (68%). There were also more likely to be non-smokers (24%) (table 12).

Table 12.
Bivariate analyses between physical health variables and threshold depression

Variable	No depression (n=2531) N (%)	Threshold depression (n=242) N (%)	χ^2
Alcohol use			2.8
Abstinence	565 (29.1)	47 (31.8)	
Moderate drinking	944 (48.6)	69 (46.6)	
At-risk drinking	314 (16.2)	19 (12.8)	
Harmful drinking	121 (6.2)	13 (8.8)	
Alcohol use combined with reduced drinking within past two years			18.20**
Abstinence	565 (29.7)	47 (32.2)	
Moderate-didn't reduce	618 (32.5)†	32 (21.9)	
Moderate-reduced drinking	290 (15.3)	36 (24.7)†	
At-risk-didn't reduce	156 (8.2)	6 (4.1)	
At-risk-reduced drinking	152 (8)	13 (8.9)	
Harmful drinking-didn't reduce	58 (3.1)	8 (5.5)	
Harmful drinking-reduced drinking	62 (3.3)	4 (2.7)	
Reduced alcohol consumption over past two years			10.11**
Abstinent	565 (27.3)	47 (27)	
Didn't reduce	951 (45.9)†	62 (35.6)	
Reduced	557 (26.9)	65 (37.4)†	
Why reduce your alcohol intake?			21.36***
Abstinent	565 (27.8)	47 (28.8)	
Personal choice	391 (19.3)	33 (20.2)	
Doctor's advice	34 (1.7)	2 (1.2)	
Medication	64 (3.2)	11 (6.9)†	
Illness/health	26 (1.3)	8 (4.9)†	
Didn't reduce	951 (46.8)	62 (38)	
Answered questions on alcohol consumption			29.2***
Did not answer	587 (23.2)	94 (38.8)†	
Answered	1944(76.8)†	148 (61.2)	
Smoking			35.8***‡
Currently smoke	264 (10.6)	57 (23.9)†	
Currently don't	2221(89.4)†	181 (76.1)	

Table 12. (continued)

Variable	No depression (n=2531)	Threshold depression (n=242)	χ^2
No. functional impairments (3068)			194.4***
Disability			182.5***‡
No disability	2292(90.6)†	147 (60.7)	
Disability	239 (9.4)	95 (39.3)†	
Long-term illness			155.6***
Yes	491 (19.4)	32 (13.2)	
No	1439 (56.9)†	63 (26)	
Limiting long-term illness	600 (23.7)	147 (60.7)†	
Chronic physical health condition (n=2773)			76.10***
None	775(30.6)†	32 (13.2)	
One condition	766 (30.3)	46 (19)	
More than one	990 (39.1)	164 (67.8)	
Self-rated vision			85.9***
Excellent	370 (14.6)†	18 (7.4)	
Very good	875 (34.6)	46 (19)	
Good	1005 (39.7)	106 (43.8)	
Fair/ Poor/ blind	280 (11.1)	72 (29.8)†	
Self-rated hearing			45.8***
Excellent	402 (15.9)†	24 (9.9)	
Very good	714 (28.2)	43 (17.8)	
Good	946 (37.4)	89 (36.8)†	
Fair to poor	496 (18.5)	86 (35.5)†	
Self-rated health			315.8***
Good	988 (39) †	42 (17.4)	
Very good	798 (31.5)†	36 (14.9)	
Fair to poor	401 (15.8)	154 (63.6)†	
Excellent	344 (13.6)†	10 (4.1)	
Five or more medications			77.09***‡
No	1574 (62.3)†	80 (33.1)	
Yes	954 (37.7)	162 (66.9)†	
Mini Mental State Exam (3068)			8.9**
Decreased odds of dementia	2402 (94.9)†	218 (90.1)	
Increased odds	129 (5.1)	24 (9.9)†	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied. All continuous variables are scaled with higher numbers being more representative of the measured construct.

There were no significant associations between threshold depression and any category of alcohol consumption (table 12). However, when the alcohol consumption variable was combined with the alcohol reduction variable, there was significance. For the purposes of multivariate analysis, the

alcohol consumption variable was combined with the reduced drinking variable as can be seen in table 13. Two of the cells in this chi square had expected counts less than five, comprising 14.3% of the cells in the analysis. This is acceptable as it is less than 20% of the expected counts, and the two cells are greater than one (Yates, Moore & McCabe, 1999).

Due to patterns identified in the literature review, variables representing chronic health conditions, long-term illness, and the related physical health variables of disability status and self-rated health were assessed for mediation in the association between depression and alcohol consumption. A test for inconsistent mediation ((MacKinnon, Fairchild, & Fritz, 2007) was run to assess whether any of the physical health related variables mediated the depression and alcohol consumption relationship.

Of these variables, evidence was found for poor self-rated health inconsistently mediating the association between threshold depression and harmful drinking of alcohol as demonstrated in figure 2. In other words, harmful drinking had an indirect effect on threshold depression through poor self-rated health.

Before adjusting for self-rated health, the coefficient for harmful drinking was 0.25 as can be seen in table 14. (p=0.43). When self-rated health was included the coefficient for harmful drinking increased to .85 (p=0.01) (table 13.). The strength of the inconsistent mediation was 0.6. No such mediation effect was found in the association between subthreshold depression and alcohol.

Table 13.
Threshold depression regression with alcohol consumption

Variable	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)
Alcohol use					
Abstinence			.42		
Moderate drinking	-.12	.19	.51	.87	(.59-1.29)
At-risk drinking	-.31	.28	.25	.72	(.42-1.26)
Harmful drinking	.25	.32	.43	1.29	(.67-2.46)

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied.

Table 14.
Threshold depression regression with alcohol consumption and self-rated health

Variable	B	S.E.	Sig.	Exp(B)	95% C.I.for EXP(B)
Alcohol use					
Abstinence			.110		
Moderate	.07	.20	.70	1.08	(.72-1.62)
drinking	.09	2.9	.76	1.09	(.61-1.95)
At risk	.85	.35	.017**	2.32	(1.16-4.65)
drinking					
Harmful					
drinking					
Self-rated health					
Good		.28	.000	1.03	(.59-1.80)
Very good	.03	.23	.89	8.08	(5.14-12.70)
Poor to fair	2.09	.40	.000***	.69	(.31-1.54)
Excellent	-.36		.37		

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied.

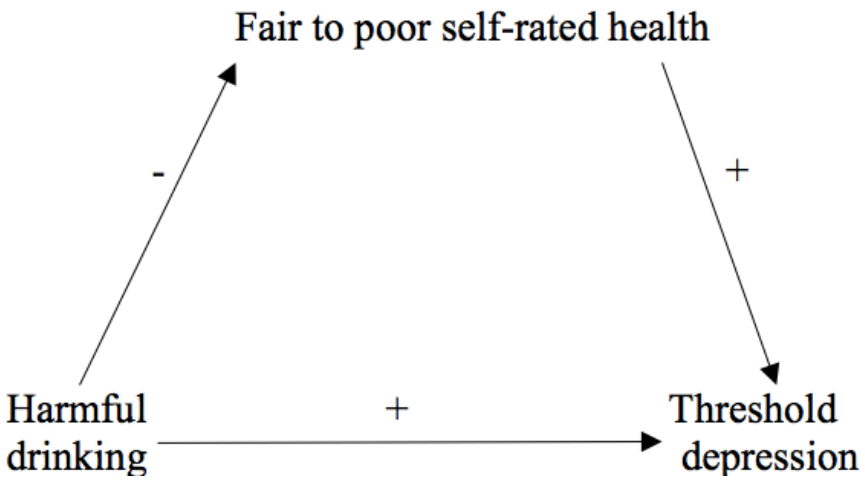

Figure 2. Visualisation of association between threshold depression and harmful drinking inconsistently mediated through poor self-rated health. Having poor self-rated health may be negatively associated with harmful drinking, and positively associated with having threshold depression. The absence of poor-self-rated health in the bivariate association between harmful drinking and threshold depression reduces the association. Figure design (Tops et al, 2008).

Threshold depression logistic regression. The first objective was to assess the association between threshold depression and alcohol consumption. Initially, a logistic regression was run with threshold depression as the dependent variable, with 23 independent variables and 1529 participants in the model (appendix 5). The most significant predictor of threshold depression was having poor to fair self-rated health (OR=2.66, $p<.01$). While the association between harmful drinking and threshold depression did not reach significance, there was a trend toward people who harmfully drink alcohol having depression, with one of the larger effect sizes (OR=2.77) in the model.

Previous research indicates that older adults with poor health reduce their drinking, but those with a significant health burden (Moos et al, 2010) or

poor self-rated health are likely to drink at risky levels (Kirchner et al, 2007). To control for this varying relationship a variable measuring whether participants had reduced their alcohol consumption over the past two years was added to the model. This variable, however, shared a category for abstinence with the alcohol consumption variable. To overcome this, the two variables were combined, as recommended in Keith (2014), and the model rerun with 23 independent variables and 1504 participants (table 15).

The resulting model was significant, $\chi 2(40) = 369.16$, $p < .001$. The model explained 53% (Nagelkerke R2) of the variance in threshold depression in adults aged 65 and over, and classified 94.7% of cases. Nine of the independent variables included in the model were significant. These were self-rated health, long-term illness, quality of life, extraversion, neuroticism, loneliness and GAD, functional impairments, and alcohol consumption. Having poor to fair self-rated health, one long-term illness, a low quality of life, decreasing levels of extraversion, increasing levels of neuroticism, loneliness, functional impairments, GAD, and heavily misusing alcohol without having reduced alcohol consumption in the past two years each all associated with having threshold depression (table 15). The odds ratio for heavily misusing alcohol without having reduced alcohol consumption in the past two years was the highest of the significant predictors (OR=4.90, $p<.05$). The second highest odds ratio was having poor self-rated health (OR=2.59, $p<.01$). The third highest was having one long-term illness (OR=2.53, $p<.05$)

Table 15.
Logistic regression analysis for variables predicting Threshold depression with combined alcohol categories and alcohol consumption variable.

Variables	B	S.E.	Sig.	Odds ratio	95% C.I.
Age group	-.11	.31	.71	.89	(.48-1.65)
75+					
Gender	.33	.31	.29	1.39	(.75-2.56)
Female					
Education					
None/Primary			.32		
Secondary	-.38	.35	.26	.67	(.34-1.34)
Tertiary	.11	.39	.76	1.12	(.51-2.45)
Self-rated health					
Good			.039		
Very good	.60	.38	.12	1.82	(.85-3.89)
Poor toFair	.95	.36	.009**	2.59	(1.27-5.28)
Excellent	1.02	.59	.08	2.79	(.87-8.92)
Marriage status					
Married	-.00	.36	.98	.99	(.48-2.03)
Long-term illness					
No long-term illness			.051		
One long-term illness	.92	.38	.015*	2.53	(1.19-5.34)
Limiting long-term illness	.45	.36	.20	1.58	(.77-3.23)
Socio-economic class					
Non manual work			.43		
Manual work	.30	.32	.35	1.35	(.71-2.55)
Never worked	-.45	.74	.53	.63	(.14-2.70)
CASP-19 Quality of Life Scale	-.05	.02	.022*	.94	(.90-.99)
Extraversion NEO-PI	-.07	.02	.008**	.92	(.87-.98)
Neuroticism NEO-PI	.14	.02	.000***	1.15	(1.09-1.22)
Conscientiousness NEO-PI	.05	.02	.058	1.05	(.99-1.11)
Social connectedness			.95		
Moderately integrated	.04	.39	.90	1.05	(.48-2.29)
Most integrated	.19	.35	.58	1.21	(.60-2.40)
Moderately isolated	.20	.53	.70	1.22	(.42-3.50)
Most isolated					
UCLA loneliness scale	.13	.07	.049*	1.14	(1.00-1.31)
Mini Mental Scale	.51	.68	.45	1.66	(.43-6.39)
Increased odds of dementia					

Table 15. (continued)

Variables	B	S.E.	Sig.	Odds ratio	95% C.I.
Generalised Anxiety Disorder (Penn Worry scale)					
GAD	.74	.31	.018*	2.11	(1.13-3.93)
Smoking status	-.00	.41	.99	.99	(.44-2.22)
Current smoker					
Disability status	-.51	.40	.20	.59	(.27-1.32)
Disabled					
Prescribed antidepressant	.22	.65	.73	1.25	(.34-4.49)
Yes					
Chronic health conditions					
No condition			.59		
One condition	-.38	.41	.35	.68	(.30-1.54)
More than one condition	-.35	.39	.36	.70	(.32-1.51)
No. functional impairments	.22	.07	.002**	1.25	(1.08-1.44)
Self-rated hearing					
Excellent			.54		
Good	.42	.37	.25	1.53	(.73-3.18)
Very good	.43	.34	.19	1.55	(.79-3.02)
Poor to Fair	.35	.48	.46	1.42	(.55-3.65)
Self-rated vision					
Excellent			.55		
Very good	.06	.38	.85	1.07	(.50-2.27)
Good	-.42	.44	.34	.65	(.27-1.57)
Blind to Fair	-.07	.55	.89	.92	(.31-2.73)
Alcohol consumption combined with reduced drinking					
Abstinent			.30		
Didn't reduce- Moderate use	.00	.36	.99	1.00	(.48-2.06)
Didn't reduce- At-risk	-.26	.66	.68	.76	(.20-2.83)
Didn't reduce- Harmful drinking	1.59	.70	.025*	4.90	(1.22-19.65 (.73-3.24)
Reduced- Moderate use	.43	.37	.25	1.54	(.49-3.76)
Reduced-At-risk	.30	.52	.55	1.36	(.24-8.73)
Reduced-Harmful drinking	.37	.91	.67	1.46	

*p< .05. **p< .01. ***p < .001. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. Neuroticism, Conscientiousness, Extraversion, Openness, and Agreeableness from NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured constructs.

Due to the finding that self-rated health may inconsistently mediate between harmful drinking and threshold depression, exploratory bivariate analyses were performed. These were conducted to explore the association between alcohol consumption, the reduction of this consumption and whether this is correlated with the main health variables (table 16). The correlates of those participants who drank at harmful levels and had not reduced this drinking in the past two years suggested were as follows. A large majority of these drinkers were male at 81.8%, aged 65-74 (71.4%), and were current smokers. Compared to participants in the remaining drinking categories, they had the highest rate of current smoking (16%) (table 16). It is interesting that despite their harmful rate of drinking, and likelihood of being current smokers, that of all the drinking categories, those who had not reduced their harmful drinking in the past two years were most likely to rate their health as excellent (22% with a standardised residual of +2). Despite this, they also had the second highest percentage of limiting long-term illness (28%), after abstainers from alcohol (31%). Compared to those who also harmfully drank but did reduce their drinking, they were slightly more likely to have a limiting long-term illness (28.6% compared to 21%). These seemingly contradictory findings were explored in further detail in the discussion chapter.

Table 16.

Bivariate analysis between categories of alcohol consumption combined with reduced drinking and physical health related variables

Variable	Abstinent (n=730)	Moderate		At-risk drinking		Harmful drinking		χ^2
		Reduced (n=412)	Didn't Reduce (n=755)	Reduced (n=191)	Didn't Reduce (n=196)	Reduced (n=81)	Didn't Reduce (n=77)	
Age group								68.3***‡
65-74	392 (53.7)	286 (69.4)	523 (69.3) †	144 (75.4)	137 (69.9)	63 (77.8)†	55 (71.4)	
75+	338 (46.3) †	126 (30.6)	232 (30.7)	47 (24.6)	59 (30.1)	18 (22.2)	22 (28.6)	
Gender								145.1***‡
Male	302 (41.4)	230 (55.8) †	310 (41.1)	126 (66) †	109 (55.6)	67 (82.7)†	63 (81.8) †	
Female	428 (58.6) †	182 (44.2)	445 (58.9) †	65 (34)	87 (44.4)	14 (17.3)	14 (18.2)	
Smoking								73.61***‡
No	652 (90.9)	357 (87.1)	667 (90)	155(82.9)	175 (92.1)	69 (85.2)	63 (84)	
Yes	65 (9.1)	53 (12.9)	74 (10)	32 (17.1) †	15 (7.9)	12 (14.8)	12 (16)	
Number of impairments								39***
>Median	344	181	283	72	63	25	31	(kruskal
<=Median	386	231	472	119	133	56	46	wallis)
Disability								37.6***‡
No	615(84)	174 (91.1)	688 (32) †	174(91.1)	186 (94.9) †	73 (90.1)	70 (90.9)	
Yes	115 (15.8) †	17 (8.9) †	67 (22.7)	17 (8.9)	10 (5.1)	8 (9.9)	7 (9.1)	

Table 16. (continued)

Variable	Abstinent (n=730)	Moderate		At-risk drinking		Harmful drinking		χ^2
		Didn't Reduce (n=755)	Reduced (n=191)	Didn't Reduce (n=196)	Didn't Reduce (n=755)	Reduced (n=191)	Didn't Reduce (n=196)	
Long-term illness								26.3**
No	358 (49)	191 (46.4)	435 (57.6) †	102(53.4)	101 (51.5)	42 (51.9)	39 (50.6)	
Yes	146 (20)	84 (20.4)	136 (18)	43 (22.5)	45 (23)	22 (27.2)	16 (20.8)	
Limiting long-term illness	226 (31) †	137 (20.1)	184 (24.4)	46 (24.1)	50 (25.5)	17 (21)	22 (28.6)	
Chronic Health Conditions								16.33
No condition	197 (27)	107 (26)	207 (27.4)	60 (31.4)	69 (35.2) †	28 (34.6)	23 (29.9)	
One condition	206 (28.2)	118 (28.6)	220 (29.1)	63 (33)	49 (25)	26 (32.1)	26 (33.8)	
More than one	327 (44.8)	187 (45.5)	328 (43.4)	68 (35.6)	78 (39.8)	27 (33.3)	28 (36.4)	
Self-rated health								87.9***
Good	249 (28)	153 (37.1)	290(38.4)	75 (39.3)	67 (34.2)	28 (34.6)	26 (33.8)	
Very good	203(27.8)	115 (27.9)	243(32.2)	53 (27.7)	72 (36.7) †	34 (42) †	22 (28.6)	
Poor-fair	203(27.8) †	116 (25.7) †	120(15.9)	30 (15.7)	21 (10.7)	5 (6.2)	12 (15.6)	
Excellent	75 (10.3)	38 (9.2)	102(13.5)	33 (17.3)	36 (18.4) †	14 (17.3)	17 (22.1) †	
5 or more medications								54.1***‡
No	374 (51.2)	228 (55.3)	493 (65.6) †	113(59.2)	145 (74) †	46 (56.8)	49 (63.6)	
Yes	356 (48.8) †	184 (44.7)	258 (26.1)	78 (40.8)	51 (26)	35 (43.2)	28 (36.4)	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied.

Subthreshold Depression

Bivariates. For subthreshold depression bivariate analyses were run with the selected independent variables for inclusion in the multivariate analyses. The sociodemographic independent variables were age, gender, social class, marital status, education, location of household, current employment, and household income (table 17). The psychological health variables were quality of life, Penn worry measure for GAD, antidepressant use, social connectedness, conscientiousness, neuroticism, extraversion, openness, agreeableness, loneliness (table 18).

The physical health variables were alcohol use, reduced alcohol consumption, reasons for reducing alcohol consumption, smoking, number of functional impairments, disability status, long-term illness, chronic physical health condition, self-rated vision, self-rated hearing, self-rated health, prescribed five or more medications, and Mini Mental State Exam score (table 19). In all, 34 variables were analysed. Two of these, such as reasons for reducing alcohol consumption, and whether or not participants completed the alcohol questions were analysed for exploratory reasons, the rest were analysed for an association with subthreshold depression (tables 17-19) for the purpose of fitting the multivariate models. Of these analyses, the majority of independent variables had significant associations.

Women were more likely than men to have subthreshold depression (60.3%). Participants aged 65-74 made up a majority (58.3%) of those with subthreshold depression. Slightly more participants with subthreshold (50.8%) depression were currently not married compared to being either widowed,

divorced, separated or otherwise single. Analyses of the socio-economic variables revealed that currently not being employed was more common among those with subthreshold depression (93.2%) than those without subthreshold depression (88.8%). Of the three socioeconomic classes, those in manual labour had the highest percentages of subthreshold depression (54.4%) (table 17). The lowest income level, measured as a household income of €18,000 or lower, was most frequent among participants with subthreshold (40.3%) and threshold depression compared to higher income levels.

Table 17.
Bivariate analyses between sociodemographic variables and subthreshold depression

Variable	No depression (n=2531)	Subthreshold depression (n=357)	χ^2
Age			4.14*‡
65-75	1594 (63)	313 (58.3)	
75+	937 (37)	224 (41.7)	
Gender			17.21***‡
Male	1256 (49.6)†	213 (39.7)	
Female	1275 (50.4)	324 (60.3)†	
Social Class			7.22*
Non manual	1479 (60.7)†	282 (54.5)	
Manual	813 (33.4)	196 (37.9)	
Never worked	143 (5.9)	39 (7.5)	
Marital status			46.3***‡
Married	1644 (65)†	264 (49.2)	
Widowed/ divorced/ separated/ single	887 (35)	273 (50.8)†	
Education			2.11
Primary/None	960 (38)	219(40.8)†	
Secondary	890 (35.2)	189 (35.2)	
Tertiary	675 (26.7)	219 (24)	
Location of household			13.9***
Dublin city	567 (22.9)	162(30.3)†	
Another town/city	746 (29.6)	152 (28.4)	
Rural area	1198 (47.5)†	221 (41.3)	
Current employment			11.09**‡
Employed			
Not employed/ retired	281(11.2)† 2232 (88.8)	33 (6.2) 497 (93.8)†	
Household income (n=3068)			35.4***
0-€18,000	691 (30.7)	207 (43.4)	
€18,001-€27,000	558 (24.8)	96 (20.1)	
€27,001-€50,000	695 (30.9)	139 (29.1)	
€50,001 +	305 (13.6)	35 (7.3)	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0.

‡Yates Continuity Correction applied.

Analysis of the psychological characteristics of participants with subthreshold depression showed that participants with subthreshold depression

(χ^2 (1)92.07, p<.001) were more likely to have a poor quality of life than those with no depression, and to have higher levels of loneliness (χ^2 (1)1.39, p<.001). Participants who scored as having subthreshold depression had higher levels of neuroticism and low levels of extraversion, and low levels of agreeableness, openness and conscientiousness (table 18). There were low levels of antidepressant usage. Of those with subthreshold depression, 4% took antidepressants. In relation to GAD, 32.8% of participants with subthreshold depression had GAD.

Table 18.
Bivariate analyses between psychological variables and subthreshold depression

Variable	No depression (n=2531)	Subthreshold depression (n=357)	χ^2
Quality of life (CASP19) (n=2089)			92.07***
Generalised Anxiety Disorder (Penn Worry scale)			115.03***‡
No worry	1759 (88.6)†	260 (67.2)	
Worry	227 (11.4)	127 (32.8)†	
Prescribed antidepressant			3.99*
No	2467 (97.5)	515 (95.9)	
Yes	64 (2.5)	22 (4.1)	
Social Connectedness			38.8***
Most isolated	114 (5.2)	42 (9.5)†	
Most integrated	706 (32)	99 (22.4)†	
Moderately integrated	922 (41.7)	166 (37.6)	
Moderately isolated	467 (21.1)†	135 (30.5)	
Conscientiousness (n=2142)			35.07***
Neuroticism (n=2143)			178.24***
Extraversion (n=2145)			53.55***
Openness (n=2127)			.03
Agreeableness (n=2145)			4.51*
Loneliness (CASP) (n=2323)			1.39***

*p< .05. **p< .01. ***p < .001. † adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. Neuroticism, Conscientiousness, Extraversion, Openness, and Agreeableness from NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct.

Analysis of the physical health characteristics of participants with subthreshold depression showed a trend toward poorer health (table 19). Compared to having no long-term illness or one long-term illness, subthreshold depression (42.1%) was most prevalent among participants with a limiting long-term illness. Participants with more than one chronic health condition were highly represented among those with subthreshold depression (57.5%).

Following this trend, participants with subthreshold depression (37.8%) were most likely to rate their health as poor to fair. Contrary to this trend, those with subthreshold depression were less likely to be current smokers (16%). There were no significant associations between subthreshold depression and any category of alcohol consumption. However, when the alcohol consumption variable was combined with the alcohol reduction variable, there was some significance with subthreshold depression (table 19).

Table 19.
Bivariate analyses between physical health variables and subthreshold depression

Variable	No depression (n=2531)	Subthreshold depression (n=357)	χ^2
Alcohol use			.48
Abstinence	565 (29.1)	104 (28.7)	
Moderate drinking	944 (48.6)	175 (48.3)	
At-risk drinking	314 (16.2)	57 (15.7)	
Harmful drinking	121 (6.2)	26 (7.2)	
Reduced alcohol consumption over past two years			10.10**
Abstinent	565 (27.3)	104 (25.8)	
Didn't reduce	951 (45.9)†	160 (39.7)	
Reduced	557 (26.9)	139 (34.5)	
Why reduce your alcohol intake?			30.03***
Abstinent	565 (27.8)	104 (26.6)	
Personal choice	391 (19.3)	78 (19.9)	
Doctor's advice	34 (1.7)	6 (1.5)	
Medication	64 (3.2)	27 (6.9)	
Illness/health	26 (1.3)	16 (4.1)	
Didn't reduce	951 (46.8)	160 (40.9)	
Answered questions on alcohol consumption			29.2*** ‡
Did not answer	587 (23.2)	175(32.6)†	
Answered	1944(76.8)†	362 (67.4)	
Smoking			7.28***‡
Currently smoke	264 (10.6)	83 (15.8)†	
Currently don't	2221(89.4)†	442 (84.2)	

Table 19. (continued)

Variable	No depression (n=2531)	Subthreshold depression (n=357)	χ^2
No. functional impairments (3068)			73.8***‡
Disability			123.1***‡
No disability	2292(90.6)†	392 (73)	
Disability	239 (9.4)	145 (27)†	
Long-term illness			83.8***
Yes	491 (19.4)	105 (19.6)	
No	1439 (56.9)†	206 (38.4)	
Limiting long-term illness	600 (23.7)	226(42.1)†	
Chronic physical health condition (n=)			64.17***
None	775(30.6)†	100 (18.6)	
One condition	766 (30.3)	128 (23.8)	
More than one	990 (39.1)	309(57.5)†	
Self-rated vision			30.8***
Excellent	370 (14.6)†	49 (9.1)	
Very good	875 (34.6)	165 (30.7)	
Good	1005 (39.7)	225 (41.9)	
Fair/ Poor/ blind	280 (11.1)	98 (18.2)†	
Self-rated hearing			36.3***
Excellent	402 (15.9)†	44 (8.2)	
Very good	714 (28.2)	136 (25.3)	
Good	946 (37.4)	211 (39.3)	
Fair to poor	496 (18.5)	146(27.2)†	
Self-rated health			148.2***
Good	988 (39) †	184 (34.3)	
Very good	798 (31.5)†	122 (22.7)	
Fair to poor	401 (15.8)	203(37.8)†	
Excellent	344 (13.6)†	28 (5.2)	
Five or more medications			21.73***‡
No	1574 (62.3)†	275 (51.3)	
Yes	954 (37.7)	261(48.7)†	
Mini Mental State Exam (3068)			16.7***‡
Decreased odds of dementia	2402 (94.9)†	485 (90.3)	
Increased odds	129 (5.1)	52 (9.7)†	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied. All continuous variables are scaled with higher numbers being more representative of the measured construct.

Subthreshold depression logistic regression. A logistic regression was run with 25 variables and 1,552 participants included in the model (table 20). The model was significant $\chi^2(40) = 216.95$, $p < .001$. It explained 22% (Nagelkerke R^2) of the variance in subthreshold depression in adults aged 65 and over, and classified 84.2% of cases. Of the 25 independent variables included in the model, five were significant. There were GAD, quality of life, extraversion, neuroticism and self-rated hearing. No sociodemographic variables were significant, and two health related variable were. Having GAD was a predictive of having subthreshold depression, as was having a poor quality of life. Being extraverted, and having excellent self-rated hearing were protective against having subthreshold depression. The odds ratio for having GAD was the highest of the significant predictors (OR=1.54, p<.05). The second highest odds ratio was having high levels of neuroticism (OR=1.05, p<.001).

Table 20.
Logistic regression for predictors of subthreshold depression

Variable	B	S.E.	Sig.	Odds Ratio	95% C.I.
Age					
75+	-.21	.18	.22	.80	(.56-142)
Gender					
Female	.21	.18	.24	1.23	(.86-1.76)
Marriage status					
Married	-.38	.22	.08	.67	(.43-1.05)
Employment status					
Currently employed	-.10	.28	.71	.90	(.51-1.58)
Household net income					
0-18000 euro			.68		
18001-27000	-.09	.23	.67	.90	(.57-1.42)
27001-50000	.09	.22	.66	1.10	(.71-1.69)
50001+	-.17	.30	.55	.83	(.46-1.50)
Alcohol consumption					
Abstinent			.47		
Moderate	.21	.19	.27	1.23	(.84-1.79)
At-risk drinking	.25	.25	.30	1.29	(.79-2.11)
Harmful drinking	.49	.33	.14	1.63	(.84-3.16)
Education					
None/ primary			.51		
Secondary	.12	.19	.48	1.13	(.77-1.64)
Tertiary	.25	.21	.23	.128	(.85-1.94)
Smoking status					
Currently smoke	.06	.24	.80	1.06	(.65-1.72)
Disabled status					
Disabled	.43	.25	.08	1.54	(.93-2.56)
Long-term illness					
No Long-term illness					
Yes			.74		
Limiting Long-term	.15	.20	.46	1.16	(.77-1.75)
illness	.10	.21	.62	1.11	(.73-1.69)
Self-rated health					
Good			.61		
Very good	.12	.19	.53	1.12	(.76-1.66)
Poor to fair	.20	.21	.35	1.22	(.79-1.88)
Excellent	-.20	.33	.54	.81	(.42-1.57)
Chronic physical health condition					
None			.39		
One condition	.16	.22	.46	1.17	(.76-1.80)
More than one	.30	.22	.17	1.35	(.87-2.11)
Self-rated hearing					
Good			.022		
Very good	-.17	.19	.37	.84	(.57-1.22)
Poor to fair	-.17	.21	.41	.84	(.55-1.27)
Excellent	-.97	.31	.002**	.37	(.20-.70)

Table 20.
(continued)

Variable	B	S.E.	Sig.	Odds Ratio	95% C.I.
Self-rated vision					
Blind to fair			.81		
Good	-.19	.24	.42	.82	(.50-1.33)
Very good	-.12	.26	.62	.88	(.52-1.47)
Excellent	-.01	.31	.95	.98	(.52-1.83)
Taking five or more medications					
Yes	-.05	.17	.77	.94	(.66-1.34)
CASP-19 Quality of Life Scale	-.04	.01	.001**	.95	(.93-.98)
Generalised Anxiety Disorder (Penn Worry scale)	.43	.21	.040*	1.54	(1.02-2.35)
Social Connectedness					
Moderately			.22		
integrated	.16	.21	.43	1.18	(.77-1.78)
Most integrated	.30	.20	.13	1.35	(.90-2.01)
Moderately isolated	-.31	.36	.39	.72	(.35-1.50)
Most isolated					
Conscientiousness NEO-PI	.02	.01	.10	1.02	(.99-1.06)
Extraversion NEO-PI	-.04	.01	.007**	.95	(.92-.98)
Neuroticism NEO-PI	.05	.01	<.001***	1.05	(1.02-1.09)
UCLA loneliness scale	.07	.04	.10	1.07	(.98-1.17)
No. functional impairments	-.02	.05	.60	.97	(.88-1.07)
Mini Mental State Exam					
Increased odds of dementia	.24	.43	.56	1.28	(.54-2.99)
Prescribed antidepressant					
Yes	-.15	.45	.72	.85	(.35-2.06)

*p< .05. **p< .01. ***p < .001. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. NEOPI= NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct

Generalised Anxiety Disorder (GAD)

Bivariates. The third objective of the study was to determine the association of GAD with alcohol consumption, and other categorical independent variables which were identified from the literature. GAD was

measured as a dichotomous variable. At-risk alcohol use was a nominal variable. To determine the variables to be used in the multivariate models, Chi Square tests for independence were run. These were used because many of the variables were not normal according to values of Skewness and Kurtosis. Logistic regressions were used to test the association of GAD with the continuous independent variables, using the model Chi Square statistic.

There were 29 bivariate tests (tables 21-23). The sociodemographic independent variables were age, gender, social class, marital status, education, location of household, current employment, and household income (table 21). The psychological health variables were quality of life, Centre for Epidemiological Studies Depression Scale for subthreshold and threshold depression, social connectedness, conscientiousness, neuroticism, extraversion, openness, agreeableness, loneliness (table 22). The physical health variables were alcohol use, reduced alcohol consumption, reasons for reducing alcohol consumption, smoking, number of functional impairments, disability status, long-term illness, chronic physical health condition, self-rated vision, self-rated hearing, self-rated health, prescribed five or more medications, and Mini Mental State Exam score (table 23). All were significant apart from two: age, and location of household.

Bivariate analyses showed that 70.3% of participants with GAD were female, more than half were married (59.5%), and 42.9% had a formal education that stopped at primary school level. Rates of GAD declined with increasing education; 35.8% who continued to secondary level scored as having GAD, as did 21.3% of those who went on to third level or higher (table 21).

Table 21.
Bivariate analyses between sociodemographic variables and generalised anxiety disorder

	No GAD (n= 2120)	GAD (n=464)	χ^2
Age			.54‡
65-75	1407 (66.4)	299 (64.4)	
75+	713 (33.6)	165 (35.6)	
Gender			73.61***‡
Male	1099 (51.8) †	138 (29.7)	
Female	1021 (48.2)	326 (70.3) †	
Social Class			24.3***
Non manual	1316 (64.3) †	235 (52.8)	
Manual	638 (31.2) †	171 (38.4) †	
Never worked	92 (4.5)	39 (17.9) †	
Marital status			7.1**‡
Married	1400 (66)	276 (59.5)	
Widowed/ divorced/ separated/ single	720 (34)	188 (40.5)	
Education			23.06***
Primary/None	700 (33.1)	199 (42.9) †	
Secondary	756 (35.7)	166 (35.8)	
Tertiary	660 (31.2) †	99 (21.3)	
Location of household	580 (27.5)	107 (23.2)	4.5
Dublin city	589 (27.9)	146 (31.6)	
Another town/city	941 (44.6)	209 (45.2)	
Rural area			
Current employment			43.55***
Employed	1888 (89.7)	427 (92.8) †	
Not employed/ retired	216 (10.3) †	33 (7.2)	
Household income (n=3068)			19.7***
0-€18,000	544 (28.9)	153 (36.7)	
€18,001-€27,000	433 (23)	112 (26.9)	
€27,001-€50,000	637 (33.9)	113 (27.1)	
€50,001 +	267 (14.2)	39 (9.4)	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡ Yates Continuity Correction applied.

In terms of socio-economic status, 92.8% of participants with GAD were not in employment at the time of the survey compared to 89.7% of those without. Among those who were employed or who previously worked, the highest percentage of workers with GAD were non manual workers (52.8%) (table 21). Of the four household income bands, those in the 0-€18,000 band were most likely to have GAD (36.7%), while those with an income of €50,000 or more had the lowest rates of GAD (9.4%).

There was a significant association between one category of the alcohol consumption variable and GAD; 47.4% of participants who drank moderately scored as having GAD compared to 50.1% who did not have GAD (table 22). More participants with GAD abstained from alcohol (34.8%) than those without GAD (26%). Having GAD was associated with having more than one chronic health condition (58.8%), a limiting long-term illness (42.9%), and rated their physical health as poor to fair (35.1%). More participants with GAD (29.1%) had a disability than those without (9.7%).

Table 22.
Bivariate analyses between physical health variables and generalised anxiety disorder (GAD)

Variable	No GAD (n= 2120)	GAD (n=464)	χ^2
Alcohol use			15.17***
Abstinence	491 (26)	139 (34.8) †	
Moderate	954 (50.1)	189 (47.4)	
At-risk drinking	320 (17) †	51 (12.8)	
Harmful drinking	131 (6.9)	20 (5)	
Answered questions on alcohol consumption			3.10‡
Did not answer	233 (11)	65 (14)	
Answered	1887 (89)	399 (86)	
Smoking			19.0***‡
Currently smoke	219 (10.5)	81 (18) †	
Currently don't	1867 (89.5) †	370 (82)	
No. Functional impairments (n=3068)			3.26***
Disability			72.7***‡
No disability	1915 (90.3) †	352 (75.9)	
Disability	205 (9.7)	112 (24.1) †	
Long-term illness			59.7***
Yes	1154 (54.4) †	184 (39.7)	
No	432 (20.4)	81 (17.5)	
Limiting long-term illness	534 (25.2)	199 (42.9) †	
Chronic physical health condition (n=2584)			64.22***
None	639 (30.1) †	72 (15.5)	
One condition	638 (30.1)	119 (25.6	
More than one	843 (39.8)	273 (58.8)†	
Self-rated vision			32.1***
Excellent	328 (15.5) †	37 (8)	
Very good	725 (34.2)	149 (32.1)	
Good	854 (39.9)	197 (42.5)	
Fair/ Poor/ blind	222 (10.5)	81 (17.5) †	
Self-rated hearing			9.0*
Excellent	322 (15.2)	56 (12.1)	
Very good	591 (27.9)	114 (24.6)	
Good	806 (38)	183 (39.4)	
Fair to poor	401 (18.9)	111 (23.9) †	
Self-rated health			93.1***
Good	773 (36.5)	173 (37.3)	
Very good	682 (32.2) †	101 (21.8)	
Fair to poor	367 (17.3)	163 (35.1) †	
Excellent	298 (14.1) †	27 (5.8)	
Mini Mental State Exam (3068)			8.08**
Decreased odds of dementia	2045 (96.5)	439 (94.6)	
Increased odds	75 (3.5)	25 (5.4)	
Five or more medications			21.11***‡
No	1307 (61.7) †	231 (50)	
Yes	811 (38.3)	231 (50) †	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡ Yates Continuity Correction applied.

Bivariate analysis of the psychological variables showed that participants with GAD were more likely to have both subthreshold depression (27.6% compared to 12.5%) and threshold depression (23% compared to 3.1%) than not (table 23). Those with GAD were highly likely to have the personality trait of neuroticism ($\chi^2(1)= 668.1$, $p<.000$), and to be lonely ($\chi^2(1)= 306.1$, $p<.000$).

Table 23.
Bivariate analyses between psychological health variables and generalised anxiety disorder (GAD)

Variable	No GAD (n= 2120)	GAD (n=464)	χ^2
Depression (CESD)	1759 (84.4)	227 (49.3)	339***
None	260 (12.5)	127 (27.6)	
Subthreshold	65 (3.1)	106 (23)	
Threshold			
CASP Quality of Life scale			.84***
Social Connectedness score	120 (5.7)	36 (7.8)	26.05***
Most isolated	463 (21.8)	133 (28.7) †	
Most integrated	870 (41)	198 (42.7)	
Moderately integrated	667 (31.5) †	97 (20.9)	
Mod isolated			
Openness (NEOPI)			3.57
Neuroticism (NEOPI)			668.1***
Extraversion (NEOPI)			62.90***
Conscientiousness (NEOPI)			39.34***
Agreeableness (NEOPI)			5.34*
Loneliness (2545)			306.1***

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡ Yates Continuity Correction applied. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. Neuroticism, Conscientiousness, Extraversion, Openness, and Agreeableness from NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct.

GAD logistic regression. A logistic regression was run to test the third objective with 24 variables and 1603 participants (table 24). The model was significant (χ^2 =(41) 568.94, p<.001). It explained 50.5% (Nagelkerke R^2) of the variance in GAD among adults aged 65 and over. It classified 88.9% of cases. Of the 24 variables included, six were significant. These were gender, quality of life, depression, conscientiousness and neuroticism, and alcohol consumption. Being female, having a poor quality of life, subthreshold depression, the personality traits of conscientiousness and neuroticism were predictive of having GAD. Drinking moderately was a significant protective factor against having GAD (OR=.64, p<.05). The most significant predictor of GAD was being female (OR=2.14, p<.001) (table 24).

Table 24.
Logistic Regression Analysis for variables predicting generalised anxiety disorder (GAD)

Variable	B	S.E.	Sig.	Odds ratio	95% C.I.
Age group					
75+	-.16	.20	.44	.85	(.56-1.27)
Gender					
Female	.76	.22	.001***	2.14	(1.39-3.30)
Socio-economic class					
Non manual work			.62		
Manual work	.03	.22	.87	1.03	(.66-1.62)
Never worked	.37	.38	.33	1.45	(.68-3.11)
Household net income					
0-€18,000			.74		
€18,000-€27,000	.18	.26	.49	1.19	(.71-2.01)
€27,000-€50,000	-.02	.26	.93	.98	(.58-1.64)
€50,000 +	.23	.34	.48	1.27	(.64-2.49)
Marriage status					
Married	.29	.27	.28	1.33	(.78-2.27)
Employment					
Employed	-.29	.37	.42	.74	(.35-1.53)
Education					
Primary/none			.59		
Secondary	-.03	.22	.89	.97	(.62-1.51)
Tertiary	-.24	.27	.36	.78	(.45-1.33)
Disability status					
Disabled	.35	.27	.18	1.43	(.84-2.43)
Self-rated hearing					
Excellent			.30		
Good	-.13	.23	.56	.87	(.55-1.38)
Very good	-.14	.24	.55	.86	(.53-1.40)
Poor to Fair	.43	.31	.16	1.54	(.83-2.84)
Self-rated health					
Good			.36		
Very good	.03	.22	.86	1.03	(.66-1.62)
Poor to Fair	-.15	.25	.55	.86	(.52-1.40)
Excellent	-.68	.43	.11	.50	(.21-1.18)
Self-rated vision					
Excellent			.06		
Very good	.43	.29	.14	1.54	(.86-2.73)
Good	.53	.31	.08	1.70	(.92-3.15)
Blind to Fair	-.22	.40	.58	.79	(.36-1.77)
Smoking status					
Currently smoke	.44	.27	.09	1.56	(.92-2.65)

Table 24. (continued)

Variable	B	S.E.	Sig.	Odds ratio	95% C.I.
Alcohol consumption					
Abstinent			.18		
Moderate	-.44	.20	.033*	.64	(.42-.96)
At-risk	-.31	.29	.28	.73	(.41-1.29)
Harmful drinking	-.08	.41	.84	.92	(.40-2.09)
Chronic health conditions			.78		
No condition	.18	.26	.49	1.20	(.71-2.01)
One condition	.13	.26	.61	1.14	(.67-1.93)
More than one condition					
Mini Mental Scale					
Increased odds of dementia	.09	.51	.85	1.09	(.39-3.01)
Long-term illness					
No long-term illness			.76		
One long-term	.17	.24	.48	1.18	(.73-1.92)
illness	.12	.24	.62	1.12	(.69-1.83)
Limiting long-term illness					
Five or more medications					
Yes	-.07	.20	.71	.92	(.62-1.38)
UCLA loneliness	-.032	.05	.52	.96	(.87-1.06)
Social connectedness					
Moderately integrated			.81		
Most integrated	.12	.24	.61	1.13	(.70-1.81)
Moderately isolated	.10	.24	.66	1.10	(.69-1.78)
Most isolated	-.25	.42	.53	.77	(.33-1.76)
Depressive symptoms (CESD)					
None			.026*		
Sub threshold	.57	.21	.009**	1.76	(1.15-2.71)
Threshold	.41	.31	.18	1.51	(.81-2.79)
Conscientiousness NEO-PI	.05	.01	.003**	1.05	(1.01-1.09)
Neuroticism NEO-PI	.21	.02	.000***	1.24	(1.19-1.29)
Agreeableness NEO-PI	.02	.01	.16	1.02	(.98-1.06)
MHcasp19_SQRT_REF	.67	.12	.000***	1.95	(1.52-2.51)

*p < .05. ** P < .01. ***P< .001. CASP= Control, Autonomy, Self-Realisation, and Pleasure, scale. CESD= centre for epidemiological studies depression scale. Neuroticism, Conscientiousness, and Agreeableness from NEO Personality Inventory. All continuous variables are scaled with higher numbers being more representative of the measured construct.

Having GAD and threshold depression

Bivariates. It was decided to further explore the results of the preceding regressions by determining the association of having both generalised anxiety disorder (GAD) and threshold depression with alcohol consumption. There were 27 bivariate tests (tables 25-27). Twenty-one of these were significant. The incidence of co-occurring GAD and threshold depression was higher in females (68.9%) than in males (table 25). It was more common among participants who worked in manual (47.6%) or non-manual jobs (45.6%) than those who never worked (7.8%). Regarding education, those whose formal education stopped after primary (52.8%) had higher incidences of having both disorders than those who stopped after secondary (23.6%), or third level/ higher.

Table 25.
Bivariate analyses between sociodemographic variables and co-occurring GAD and threshold depression

Variable	No co-occurrence (n=106)	Co-occurring Gad and depression (n=2438)	χ^2
Age			.00
65-75	1611 (66.1)	71 (67)	
75+	827 (33.9)	35 (33)	
Gender			11.63***‡
Male	1183 (48.5)†	33 (31.1)	
Female	1255 (51.5)	73 (68.9)†	
Social Class			9.81**
Non manual	1475 (62.8)†	49 (47.6)	
Manual	751 (32)	47 (45.6)	
Never worked	122 (5.2)	7 (6.8)	
Marital status			2.32‡
Married	1590 (65.2)†	65 (61.3)	
Widowed/ divorced/ separated/ single	848 (34.8)	65 (38.7)†	
Education			16.3***
Primary/None	827 (34)	56 (52.8)†	
Secondary	886 (36.4)†	25 (23.6)	
Tertiary	721 (29.6)	25 (23.6)	
Location of household			1.64
Dublin city	644 (26.5)	29 (27.6)	
Another town/city	692 (28.5)	35 (33.3)	
Rural area	1091 (45)	41 (39)	
Current employment			1.51‡
Employed	2182 (90.2)	99 (94.3)	
Not employed/ retired	238 (9.8)	6 (5.7)	
Household income (n=3068)			10.2*
0-€18,000	650 (30)	34 (36.2)	
€18,001-€27,000	508 (23.5)	32 (33)†	
€27,001-€50,000	710 (32.8)	23 (24.5)	
€50,001 +	298 (13.8)†	6 (6.4)	

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡ Yates Continuity Correction applied.

A decreased quality of life was associated with having this co-occurrence ($\chi^2(1)= 177.3$, p<.001) (table 26). Increased levels of neuroticism, conscientiousness, and not being extraverted were also associated with having both GAD and depression. Participants with both GAD and depression had a high incidence of loneliness ($\chi^2(1)= 149.8$, p<.001).

Table 26.
Bivariate analyses between psychological health variables and comorbid GAD and threshold depression

Variable	No co-occurrence (n=106)	Co-occurring GAD and Depression (n=2438)	χ^2
Quality of life (CASP19) (n=2089			177.3***
Social Connectedness			16.6***
Most isolated	144 (5.9)	8 (7.5)	
Most integrated	545 (22.4)†	39 (36.8)	
Moderately integrated	735 (30.1)	17 (16)	
Moderately isolated	1014 (41.6)	42 (39.6)†	
Conscientiousness (NEOPI) (n=2142)			12.42***
Neuroticism (NEOPI) (n=2143)			283.2***
Extraversion (NEOPI) (n=2145)			61.49***
Openness (NEOPI) (n=2127)			1.82
Agreeableness (NEOPI) (n=2145)			.28
Loneliness (CASP) (n=2323)			149.8***

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied.

Regarding the physical health correlates of participants with both GAD and depression, participants without a disability (60.4%) were more likely to have both GAD and depression than those who had a disability (table 27). Having functional impairments was an indication that GAD and depression together were present ($\chi^2(1)= 85.14$, $p<.001$). Having a limiting long-term illness was also predictive of having both GAD and threshold depression (60.4%), more so than having a long-term illness that was not rated as being limiting (26.4%). Similarly, having more than one chronic health condition was highly correlated with having both (70.8%), as was having poor to fair self-rated health (57.5%), and being prescribed five or more medications (63.2%).

There was no association with any category of alcohol consumption.

Nonsmoking at 72.1% was more common among participants with having GAD and threshold depression than smoking

Table 27.
Bivariate analyses between physical health variables and having both GAD and threshold depression

Variables (continuous variable N)	No co-occurrence (n=106)	Co-occurring GAD and depression (n=2438)	χ^2
Alcohol use			2.60
Abstinence	590 (27.2)	29 (34.9)	
Moderate drinking	1078 (49.7)	36 (43.4)	
At-risk drinking	355 (16.4)	12 (14.5)	
Harmful drinking	144 (6.6)	6 (7.2)	
Answered questions on alcohol consumption			14.03***‡
Did not answer	271 (11.1)	23 (24.2)†	
Answered	2167 (88.9)†	72 (75.8)	
Smoking			25.1***‡
Currently smoke	265 (11.1)	29 (27.9)†	
Currently don't	2128 (88.9)†	75 (72.1)	
No. Functional impairments (3068)			85.14***
Disability			75.59***‡
No disability	2171 (89)†	64 (60.4)	
Disability	267 (11)	42 (39.6)†	
Long-term illness			57***
Yes	1292 (53)†	28 (26.4)	
No	493 (20.2)	14 (13.2)	
Limiting long-term illness	653 (26.8)	64 (60.4)†	
Chronic physical health condition			34.84***
(n=)	687 (28.2)	12 (11.3)	
None	727 (29.8)	19 (17.9)	
One condition	1024 (42)	75 (70.8)†	
More than one			
Self-rated vision			41.1***
Excellent	357 (14.6)†	6 (5.7)	
Very good	834 (34.2)†	22 (20.8)	
Good	982 (40.3)	47 (44.3)	
Fair/ Poor/ blind	265 (10.9)	31 (29.2)†	

Table 27. (continued)

Variables (continuous variable N)	No co-occurrence (n=106)	Co-occurring GAD and depression (n=2438)	χ^2
Self-rated hearing			9.6*
Excellent	364 (14.9)	11 (10.4)	
Very good	668 (27.4)	23 (21.7)	
Good	932 (38.2)	39 (36.8)	
Fair to poor	474 (19.4)	33 (31.1)†	
Self-rated health			95.31***
Good	908 (37.2)†	25 (23.6)	
Very good	757 (31.1)†	15 (14.2)	
Fair to poor	457 (31.1)	61 (57.5)†	
Excellent	316 (13)†	5 (4.7)	
Five or more medications			23.02***‡
No	1476 (60.6)†	39 (36.8)	
Yes	958 (39.4)	67 (63.2)†	
Mini Mental State Exam (3068)	2349 (96.3)	100 (94.3)	1.14
Decreased odds of dementia	89 (3.7)	6 (5.7)	
Increased odds			

*p< .05. **p< .01. ***p < .001. †adjusted standardised residual was more than +2.0. ‡Yates Continuity Correction applied.

Co-occurring GAD and threshold depression logistic regression. A model was run with 9 variables and 1917 participants with co-occurring GAD and threshold depression as the dependent variable (table 28). The model was significant (χ^2 (14)=252.11, p<.001). It explained 46.2% (Nagelkerke R^2) of the variance in comorbid GAD and depression among adults aged 65 and over. It classified 97% of cases. Of the 9 variables 3 were significant. The most significant predictor of this co-occurrence was neuroticism (OR=1.25, p<.001).

The two remaining significant predictors were having a poor quality of life (OR=.94, p<.01). and having an increased number of functional impairments (OR=1.15, p<.05).

Table 28.
Logistic Regression Analysis for variables predicting co-occurring GAD and depression

Variable	B	S.E.	Sig.	Odds ratio	95% C.I.
Gender	-.00	.33	.98	.99	(.51-1.89)
Alcohol use			.57		
Abstinence	.11	.35	.75	1.12	(.55-2.55)
Moderate	.56	.47	.22	1.76	(.70-4.44)
At-risk	.58	.66	.37	1.79	(.49-6.58)
Harmful drinking					
Self-rated health					
Good	.42	.38	.26	1.53	(.72-3.25)
Very good	.23	.48	.63	1.26	(.49-3.24)
Fair to poor	.37	.75	.61	1.45	(.33-6.33)
Excellent			.71		
No. Functional impairments	.14	.06	.028*	1.15	(1.01-1.31)
Long-term illness					
Yes	.00	.47	.94	1.00	(.39-2.55)
No	.12	.39	.99	1.13	(.52-2.42)
Limiting long-term illness			.74		
Neuroticism NEO-PI	.22	.02	.000***	1.25	(1.19-1.32)
Extraversion NEO-PI	-.06	.03	.06*	.94	(.88-1.00)
Quality of Life Scale	-.05	.02	.005**	.94	(.90-.98)
Conscientiousness NEO-PI	.08	.02	.002**	1.09	(1.03-1.15)

*p < .05. ** P < .01. ***P< .001

Summary

Between GAD and the two forms of depression, GAD was most prevalent in this thesis with 18% of participants scoring as having it. A slightly lesser number of participants (16%) had subthreshold depression. Less again had

threshold levels of depression (7%). Despite these percentages, only 3% of participants reported taking antidepressant medication. Close to a third of the sample did not complete questions about their alcohol consumption. Of those who responded, almost half of these were moderate drinkers (48%). At-risk drinking was less common at 16%. The smallest category of drinkers were harmful drinkers at 6%. The main quantitative findings are listed in bullet point below beginning with threshold depression, then subthreshold depression, GAD and finally GAD combined with threshold depression.

Threshold depression

- Self–rated health inconsistently mediated the association between threshold depression and harmful drinking in otherwise unadjusted analysis.
- Harmful drinking that had not been reduced in two years was significantly associated with having threshold depression in multivariate analysis.
- Other predictors for threshold depression were having poor to fair self-rated health, one long-term illness, and functional impairments, a poor quality of life, the personality trait of neuroticism, and GAD.
- Being extraverted was a protective factor against having threshold depression.

Subthreshold depression

- There was no significance between any category of alcohol consumption with subthreshold depression.

- Predictors of subthreshold depression were having GAD, and having a poor quality of life.
- Protective factors against having subthreshold depression were being extraverted and having excellent self-rated hearing.

GAD

- Drinking moderately was a protective factor against having GAD.
- Predictors for having GAD were being female, having a poor quality of life, depression, conscientiousness, and neuroticism.

GAD combined with threshold depression

- No category of alcohol consumption was associated with having both GAD and threshold depression.
- Predictors for having both GAD and threshold depression were neuroticism, having a poor quality of life, and functional impairments.

Chapter Six: Qualitative Results

The objectives for the qualitative analysis were formed from the quantitative findings. In brief, the quantitative analyses found that factors associated with having threshold depression were loneliness, poor self-rated health, a long-term illness, functional impairments, a low quality of life, neuroticism, and having GAD. Factors associated with having subthreshold depression were having GAD and a poor quality of life. Being extraverted, and having excellent self-rated hearing were protective factors against having subthreshold depression. Factors associated with GAD were being female, having a poor quality of life, subthreshold depression, and the personality traits of conscientiousness and neuroticism.

The finding that harmful drinking is predictive of threshold depression, and that this association may be an indirect one was explored in the qualitative interviews. The complexity of this association, in addition to the finding that harmful drinking and depression co-occur in the older Irish population, was believed to warrant further exploration. Particularly the relationships between not reducing consumption, self-ratings of health, threshold depression, and harmful drinking. It was from these relationships that the objectives for the qualitative analysis were formed. There were two objectives for this phase. To explore the perspectives and beliefs of health practitioners regarding their professional experience of older adult mental health and alcohol consumption, and to explore their perceptions of the role of alcohol consumption in older adult depression. An interview schedule was created to achieve these objectives. The participants interviewed all had professional experience with

older adult patients who had depression and/or anxiety and who drank harmfully. It is important to note that the participants definition of harmful drinking (or alcohol misuse) may not strictly be that of 28+ drinks per week for women and 40+ drinks for men, but as this is a recognised international definition (Drummond et al, 2011) it is likely that they were referring to similar quantities.

The resulting interviews were coded in two cycles. I organised these codes into categories, and then searched these categories for similarities until four possible themes were recognised. These were reviewed and collapsed into two main themes: Loss and Denial. Three subthemes were created from each. For Loss the subthemes were (1) Loneliness, (2) Loss of meaning in life, and (3) Loss and harmful drinking. The subthemes of Denial were (1) Denial of depression, (2) Denial of harmful drinking, and (3) Denial as a way to manage depression, harmful drinking, and thus poor physical health. Loss appeared to contribute to the participant's patients developing depression on its own, and developing depression and co-occurring harmful drinking. Denial appeared to be a way through which the interviewee's patients maintained their depression, and co-occurring depression and harmful drinking (figure 3). These themes are described, with relevant extracts from the interview data quoted to support their analysis. Each extract is labelled with a participant identifier.

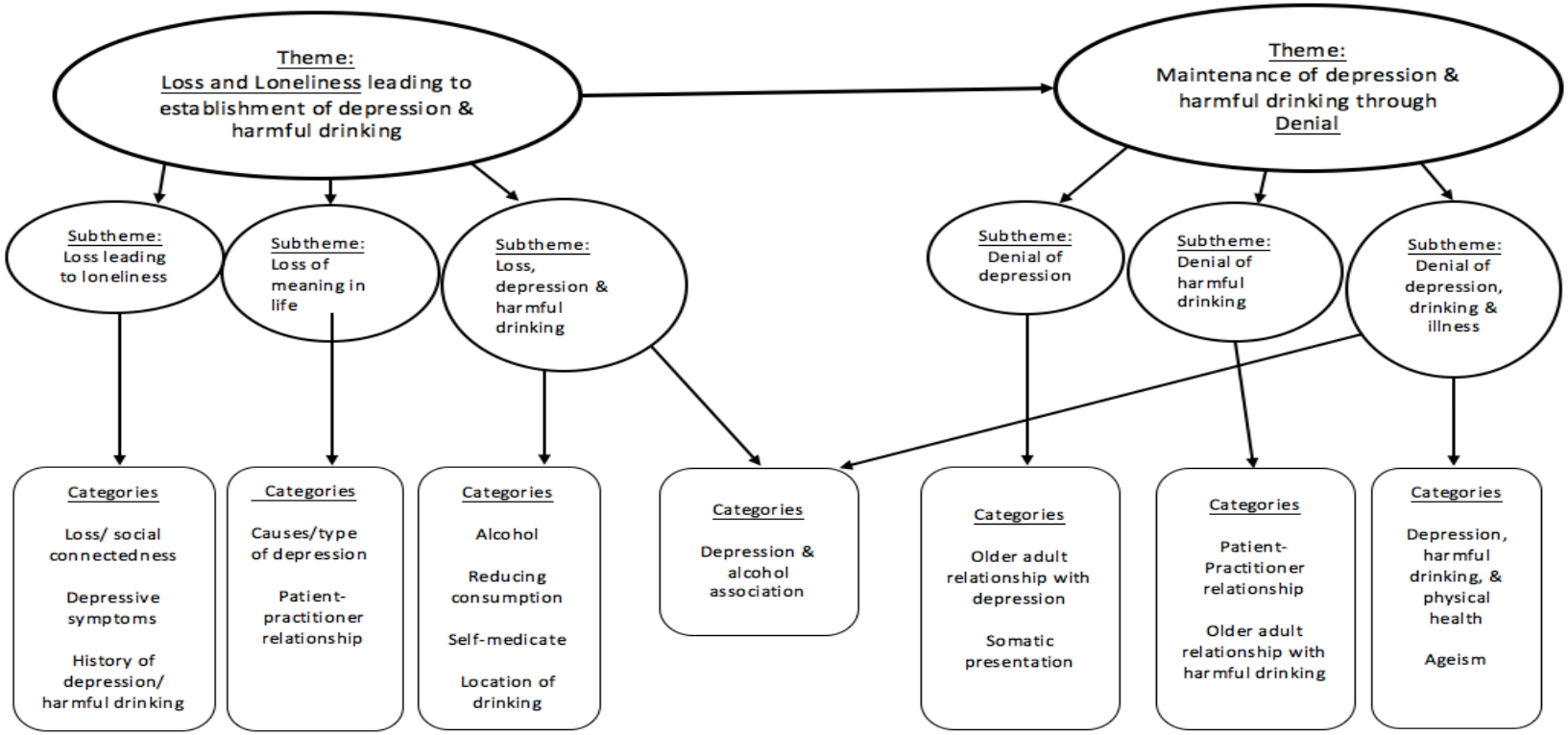

Figure 3. Loss as a source of older adult depression, and co-occurring harmful drinking, which may then be maintained by denial of depression, denial of harmful drinking, and denial of the effects of this drinking, and/or depression, on physical health.

Loss

In the multivariate analysis of threshold depression, factors that were predictive of threshold depression and related to the theme of loss were, in addition to harmful drinking, being lonely, having a long-term illness, and having functional limitations. As the analysis was cross sectional, it could not be determined whether these were indicative of recent loss, i.e. loss of companionship, of health, of functional ability, or whether they were more long-term aspects in those participant's lives. However, analysis of the interviews suggests that these losses are prevalent among older adults with depression. In addition to the abovementioned factors, the interviewed health practitioners reported the loss of friends and family due to bereavement, the loss of a career and the structure and meaning associated with having a specified role in life, loss of emotionality, of physical and cognitive ability in the lives of their older adult patients. Each of these losses were noted by the interviewees as having an impact on depression in this population. Analysis revealed three sub themes: (1) loneliness, (2) loss of meaning in life, and (3) loss and alcohol. The first two subthemes detail the ways through which these losses can contribute to depression in the health practitioners' patients. The latter subtheme details how these losses can lead both to depression, and co-occurring harmful drinking.

Loneliness. Loss of interest or pleasure in activities is an integral feature of depression, "they lose interest… in the things they usually do." [GP 2]. Many forms of loss were discussed by the health practitioners in the interviews, almost all of which were said to result in loneliness in their older adult patients. The understanding that loneliness was the result of these losses

was a common thread throughout the interviews. When asked about the role of loneliness in depression, one psychiatrist reported that it played a very important one, and went on to mention the many losses that can occur in later life—including cognitive loss—in the context of these being factors that lead to loneliness and subsequently, depression.

> Overtime you kind of lose things, financial wealth, you lose your health, but you also lose kind of people around you through death and for various reasons and if people aren't interacting socially they're cognitively, probably declining and getting more isolated and losing their reasons to live, less purpose in life, so I think it has a huge impact. [Psychiatrist 5].

As many of these losses are associated with ageing, they were seen as being particularly pertinent to later life to the extent that social isolation and the loneliness associated with it was seen as an almost inevitable part of growing older, especially if older adults are widowed:

> I would say most of our older adults live either as couples or by themselves, especially the widows and widowers and so on, most of those would have some degree of loneliness and social isolation. [GP 3].

Social isolation and loneliness were frequently identified when discussing depression. While the role of loneliness in older adult depression was a question in the interview schedule, the issue almost always rose before this had been asked. Perceptions as to the specific relationship between loneliness and depression varied, but all interviewees acknowledged its importance in this population relative to younger age groups; loneliness was perceived to be

inextricably linked to older adult depression. The ways in which the two were linked, from loneliness being almost a part of depression, to being a symptom, to being a precursor, are presented below.

While many of the interviewees associated anxiety with depression, often referring to agitated depression in the older population, one psychiatrist believed loneliness to be a more important factor than anxiety. The reason given was the number of losses that can be experienced in these years:

> …For all the reasons that we've gone through like retirement, empty nest syndrome, all those things? Friends getting sick and dying, loss of role, loss of religion is huge, and I would say loneliness is huge. [Psychiatrist 3].

Religion is known to be a protective factor against the development of depression in the 65 and over population (Braam et al, 2001), so the loss of it is likely to be a factor, however it wasn't commented on further in the interviews. A lack of emotion in older adult presentations of depression was commented on by many of the interviewees, with their older adult patients being more likely to complain of somatic symptoms than emotional issues. It was believed that the gradual accumulation of these losses may explain the loss of emotion in this population's presentation of depression, in that they become worn down by these losses: "…what you tend to see less as people get older, and it's not just 65 or older, it's progression through life, is the loss of emotionality associated with depression." [psychiatrist 3].

> I also think the nature of depression in older people, things from isolation, things from the fact of increasing loss, it's often a kind of gradual process, whereas for young people it's a more intense process

as such. So I think the nature of what caused them to be depressed tends to be more a, they're worn down sort of, and then therefore it's harder to recognise [GP 4].

Regarding the closeness of loneliness to depression, other interviewees introduced slightly more distance between the two, with the suggestion that loneliness was a symptom of depression in their older adult patients. After somatic symptoms, it was believed to be one of the primary symptoms in this population:

…so insomnia, tiredness, fatigue, abdominal pain, problems like this being high up the symptoms board, so to speak, then with an overlay of other problems such as social isolation, loneliness. [GP 3].

Apart from perceiving loneliness to exist along the same lines as depression, or seeing it as a symptom of it, a further perceived association between loneliness and depression was identified. Many interviewees believed loneliness to be a precursor to depression, but more than a precursor, it was perceived as a mediating factor between many of the losses common to older adult life and the development of depression.

I think probably quite an important role and I'm sure that can be a trigger, or, the word I can think is co-facilitate, but it could actually be a factor also among others to the development of depression. [Psychiatrist 4].

Regardless of their perception of just how related loneliness is to depression, almost all of the interviewees mentioned the importance of socialization as a treatment for depression in their patients, or a protective factor against their patients becoming depressed. This illustrates the significance of it as a risk

factor for depression in this population. Most of the GPs said they would advise their older adult patients to join their local community centre or a social group as an initial treatment for depression, especially if they believed their patient had subthreshold depression: “So I’ll often like refer them to groups and sort of intervene, or you know bring them back and follow up.” [GP 2]. Loneliness was perceived by the interviewed health practitioners to play a central role in the development of depression in their older patients. The many losses experienced in this time of life were believed to contribute to this loneliness.

Loss of meaning in life. The second subtheme within the theme of Loss focused on a loss of meaning in life. This is not completely independent of the loneliness subtheme, but it represents another aspect of the situation identified by the interviewed health practitioners as leading to depression and which was thought to be particularly pertinent to later life. Loss of meaning’s close association with loneliness is exemplified by a quote from one of the psychiatrists used in the loneliness subtheme where, as they list various losses related to loneliness and depression, they include more existential losses: “…losing their reasons to live, em, less purpose in life…”. [Psychiatrist 5]. This points to an existential crisis, a loss of meaning which could arise due to experiencing these losses at an age when you are closer to the end of life. These losses, occurring at this time, could facilitate the older adult’s questioning the meaning of their existence.

With the onset of retirement, many of the interviewees’ patients lost a sense of community, or just daily social contact, both of which are likely to result in loneliness, but in addition to these losses, they lost a significant block

of structured time. One GP expressed their shock at the emptiness of their older patients lives: “It’s often quite shocking how little people seem to do, and how much time they seem to spend sitting at home not doing very much.” [GP 3].

Participants believed that post-retirement many older adults are at a loss as to how to occupy their day, and perhaps in addition to becoming lonely they become bored “…I think when they stop working, there’s maybe a bit of boredom there…” [GP 2]. The alcohol liaison nurse believed that older adults are less used to being on their own. The nurse reported that this was a generational issue where older generations in Ireland tended to live in the communities they had grown up in and so rely on family more so than younger generations who had to move away for work and learned to rely on their friends almost as much as their family. “…I feel that the older people, they always had a sense of community around them, and stuff like that, and for example when those older people start dying then, they feel that you know they’ve never coped beyond their own families.” Regarding their difficulty with being alone, a GP spoke of their older adult patient’s resultant boredom:

> …I think when they stop working, there’s maybe a bit of boredom there, I think that generation won’t sit down and watch a series on Netflix, they’ll read the paper, that’s about the height of it… [GP 2].

This boredom combined with an increasing lack of meaningful roles for older adults in society can create for the older adult a crisis of meaning. A psychiatrist put it starkly saying that that the only place left for the older adult in society between is “a nursing home and death…” The psychiatrist continued:

> …their place in society has become increasingly marginalised, they're seen as a nuisance and a burden and compared to maybe in the older days where the matriarch and patriarch was with the grandparents, that role was with the grandparents and their wisdom was often sought, that's all gone, you know… [Psychiatrist 3].

The psychiatrist recounted a personal story of an older man they knew who had lived on their road. The account encompasses the theme of loss, in this case due to enduring grief, the resultant lack of meaning in his life, and how the man used alcohol to compensate for these losses until he gave up on living:

> I'm thinking of poor old Matthew who lived on our road whose his wife died. He'd hobble off to church or mass every day and pop into the offy [sic] on the way home and every Tuesday morning he'd have this huge plastic bag full of empty cans for recycling out on the footpath… after his wife died… I saw him in hospital a few years ago, and, he just said, "you know what, I just want to die, now" and he did, you know. [Psychiatrist 3].

The interviewees believed that the loss of structure and resulting boredom that their older adult patients experienced after retirement were contributing factors towards the development of depression. The lack of meaningful roles in society for older adults was another pertinent factor.

Loss, depression and alcohol. While the subthemes of loneliness, and of loss of meaning in life illustrate how loss can contribute to the development of depression in the older adult patients of the interviewees, the third subtheme loss, depression and alcohol illustrates how these losses might contribute to the

development of harmful drinking in addition to depression, and the development of their co-occurrence.

As the story of Matthew, recounted by the above psychiatrist, illustrates, loss and loneliness, in addition to leading to depression, are also associated with harmful drinking. Three broad pathways from loss or loneliness to co-occurring depression and harmful drinking were identified from the interviews. The first was the use of alcohol to self-medicate the stress of losses common to this life stage, particularly grief, loneliness, and/or the accumulation of these losses. One psychiatrist believed this pathway was relatively rare:

> Occasionally, you'll get a patient who does develop a depressive episode and self-medicates with alcohol or who develops a very difficult grief response and then self-medicates with alcohol but in terms of likelihood of it, it's much more likely that the alcohol is the first piece." [Psychiatrist 2].

Another psychiatrist believed it to be slightly more common: "A lot of people who drink in late life can maybe do so through loneliness and the loneliness may have brought on a depression because loneliness is a stress." [Psychiatrist 1]. While another believed about 50% of their patients develop co-occurring depression and harmful drinking through self-medicating with alcohol:

> …I would see probably 50 50, a lot of people would present with a primary issue with depression and you see a very biological illness of depression and they may use some alcohol to self-medicate…, and then you see the person that would have a primary issue with alcohol and

> subsequently develops depression, so probably half and half. [Psychiatrist 4].

Through this pathway, loneliness and loss contribute to the co-occurrence of depression and harmful drinking, through using alcohol to self-medicate their loneliness or the depression that develops from this loneliness. Continuing with the older adult patients of the interviewees who don't have a history of depression or harmful drinking, the participants believed that the use of alcohol to self-medicate loneliness could become a maintaining factor in the alcohol and depression relationship. The person drinks to deal with the stress of their loneliness; both their drinking and their loneliness are liable to lead to depression, which then leads to increased drinking again, and so on. Interviewees used the terms "vicious cycle" [Psychiatrist 3], or "vicious circle" [GP 3] to describe the complexity of this relationship between depression and harmful drinking. The interviewees often included factors such as loneliness (or poor physical health) in this cycle:

> …social isolation and loneliness I would say is the biggest thing I would see, which again would be feeding into the depression which again would be feeding into all the reasons why they drink; it's like a spiral. [Alcohol liaison nurse].

A second pathway to co-occurring depression and harmful drinking that developed from the interviews was that of the older adult patient straying into increased alcohol consumption due to the loss of structure in their day, the resultant boredom and the need to fill the time. Participants believed that the older adult's drinking imperceptibly becomes problematic, and this then leads to the development of depression.

> …they've always had a modest amount of alcohol intake and they're a bit bored, and sure there's no harm in having a few glasses of wine when you're making dinner and then that just gradually creeps up until it comes at a significant level and then that does have a pro depressant effect…" [GP 3].

Each of the two above pathways are possible in the case where the older adult does not have a history of either depression or harmful drinking. A third path toward co-occurring depression and harmful drinking in this population was identified by a psychiatrist for those patients who have a history of harmful drinking. In those who have a history of harmful drinking, but who had managed to avoid becoming depressed while they were working, the loss of their career, and the lack of structure this entails may have led to them increase their drinking. As a result of this increase they may then go on to develop depression:

> …it depends upon the story, it may be for example somebody was a pretty heavy drinker all their lives, never ran into depression in their adult life, and then when retirement came along—thinking of people I know—there was a lot more time for boozing, and the depression would come. [Psychiatrist 3].

The question of where the older adult drinks was thought to play a role in the development or maintenance of co-occurring depression and harmful drinking. There was no definite agreement as to whether older adults drink alone, at home, or socially, in a pub or sports club setting. Drinking at home was reported to be common among the interviewees' patients with depression, and for some harmful drinkers. The interviewees believed their patients saw this as

safer than going out to the pub: "I go into the bed and I drink in there, sure what can happen to me in the bed?" [Alcohol liaison nurse]. Many of the interviewees were undecided as to whether older adults with or without depression drank in or outside the home, although one ascertained that those aged 75 and over were more likely to drink at home. One result of drinking at home is that it can further reduce an already reduced social network, as a GP noted "this means that they can lose social contacts." [GP 1].

The social aspect of drinking in the pub was thought to be beneficial in this regard. However, if the older adult was retired and had always frequented pubs they may be tempted to spend the day drinking, setting them onto the third pathway toward co-occurring depression and harmful drinking as outlined above.

> …again I'm thinking of a few individuals who retired drinking heavily and they have their routine where they go to the pub early in the day and stay there most of the day and come back home at night… [GP 3].

This was something a few of the interviewees were cautious of when treating older adult's harmful drinking and depression. They were reluctant to advise their patients to stop visiting the pub: "…some people are socially isolated and two drinks down in the pub is the only social outlet they have…"[Psychiatrist 5]. Therefore, they had to weigh up the benefit of their patients visiting the pub, and try to accommodate it in their lives while reducing their drinking:

> Back to the social isolation again, if you don't actually go to the pub they often won't see people from one end of the day to the other, and that's what I find very difficult if you've to tell somebody to stop

> drinking and what I kind of say to them is, would you go to the pub for your lunch? You know you're actually out, you're meeting the same people but you're eating you're not drinking, to try and encourage them, you still want them to socialise. [Alcohol Liaison Nurse].

The interviewees believed that loss provided a route toward depression for their older adult patients, mostly through loneliness, but also through a loss of meaning in life. The accounts presented here help to explain the findings from multivariate analysis where loneliness was a significant predictor of threshold depression. Loneliness may also lead to a particular type of depression. The accumulation of losses over time could play a role on the lack of emotionality in older adult depression, this coupled with the loss of structure and loss of meaning noted by the interviewees could be formative factors in a type of depression that is often experienced by older adults, one characterised by a lack of emotions, and perhaps more existentially oriented than that which is often experienced by younger age groups.

Regarding the role of alcohol consumption in older adult depression, three pathways were identified as possibly contributing to the co-occurrence of depression and harmful drinking. Many of the interviewees' patients self-medicated the stress of their losses, or loneliness, or a resultant depression with alcohol. A second pathway identified indicated that some of the participants' patients strayed into harmful drinking which led to depression. A third category of older adult patients had a history of harmful drinking. This increased after retirement, which again was believed to lead to depression.

Denial

The second main theme developed from the interviews was that of denial. This may help to contextualise the following quantitative findings from this thesis. In the logistic regression analysis, harmful drinkers who did not reduce their drinking were likely to have depression. Exploratory post hoc analysis showed that harmful drinkers who did not reduce their drinking also had the highest rates of participants who claimed their health was excellent, in addition to the second highest rates of participants who had a limiting long-term illness. Additionally low self-rated health was predictive of depression, and may play a role in the depression and harmful drinking association. The theme of denial may explain this complicated co-occurrence of depression and harmful drinking in this cohort. Within Denial there were three subthemes: (1) denial of depression, (2) denial of harmful drinking, and (3) denial as a way to manage depression, harmful drinking, and thus poor physical health. The first subtheme illustrates how depression may be maintained through denial. The second demonstrates how harmful drinking may also be maintained through denial, and the third illustrates how along with the previous denials, the older adult may denial their poor health.

Denial of depression. This was the first subtheme of denial. Many of the interviewees referenced their older adult patient's perceptions of depression. They contrasted younger adult patients who would readily say they feel depressed, to the older age group who were much less likely to do so: "…it's probably a matter of they don't want to come to you and say I'm depressed which is what a lot of younger people will do." [GP 2]. The majority of their patients were unlikely to identify as a person who has or could have depression. A common and surprising belief was that diagnosing depression in

older adults was not much more difficult than in younger age groups. Rather the difficulty was in helping the older adult patient to accept that they are experiencing a mental health issue. The difficulty is, " maybe not so much in diagnosis but in sharing the diagnosis or acceptance of the diagnosis. That is probably one of the problems, especially in older patients…" [GP 3]. This sentiment echoed through the interviews, particularly in those with GPs, perhaps this was because, of the doctors interviewed, GPs often made the initial diagnosis of depression.

According to the interviewees, their older adult patients don't identify as being the type of person who could have depression. Their patients may have a particularly rigid construct of depression, a binary idea of it wherein you are the type of person who can have it or not, and they were often not that type. Or their perception is that depression is not something that can arise due to circumstance but is due to genetics: "…they will often say it's not in my family you know, or I'm not the depressive type, or things like that." [GP 2].

The issue of acceptance was believed to be compounded by the predominance of somatic symptoms over emotional symptoms in many presentations of older adult depression. Somatisation was mentioned by almost all the of interviewed doctors as being a large part of the presentation of older adult depression. "…you have less people coming in and complaining about depression, you're often looking at more apathy, tiredness, whereas young people come in really complaining of being depressed or down." [GP 4].

It may be more of an issue for GPs than psychiatrists however, for two reasons. Somatic conditions come under their remit, and they will often make an initial diagnosis of depression before referring a patient to mental health

practitioners such as psychiatrists. As GPs work in the community they have the opportunity to develop a relationship with their patients over a number of years. This relationship made them confident in their ability to identify the symptoms of depression in their older patients: "So, diagnosing it probably isn't that tricky, because we kind of know our patients fairly well, you know." [GP 2]. This is despite the predominance of somatisation in the older adult age group: "It's also obviously, when you present with somatic symptoms, it's harder for the doctor to detect it but it's also harder for the doctor to persuade the patient that it's a depressive disorder…" [GP 4].

A GP developed a method whereby they would notify their patient of the possibility of their having depression but suggest they carry out tests to rule out any physical health issues which might be contributing to their symptoms. This gives the patient a sense of autonomy in the diagnostic process, and time to come to terms with the possibility of having depression, both of which may help in their acceptance of a mental health diagnosis.

> Obviously when you meet someone with those symptoms you still have to out rule you know physical causes… if you identify it early on that this is related to mood… you tell them, but you say we need to out rule other things, so the advantage of doing that is if you say, listen I don't know what this is, we have to do tests. And you come back, and say, well we did all the tests and they're all normal so I think it's depression… [GP 4].

Somatisation may play a role in older adult denial of depression. One psychiatrist suggested that somatisation is due to a personality construct called Alexithymia, whereby the person lacks the ability to describe feelings and

emotions. “People who don’t have words for emotions, so it’s like being colour blind…” [Psychiatrist 2]. This type of denial would be mostly unconscious, arising from the patients’ lack of insight into their condition as opposed to a conscious repudiation of it. This may go some way toward explaining denial of depression in this population. “…they’re more likely not to really notice, to identify it as a depression so they’re more likely to notice the somatic symptoms.. [GP 4].

While somatisation may play a role in this denial, it can also be conscious. Participants reported instances where their patients were aware of their depression, but for societal or personal reasons refuse to accept it. The alcohol liaison nurse said that for older adult patients to acknowledge the possibility of their having a mental health issue is to feel like a failure:

> … there’s a huge pride element there, none of them like to ever say they went to see a psychiatrist. Whereas younger people will talk about mental health, older people won’t and to acknowledge that you have a mental health issue, and that you have to go and see a psychiatrist is kind of a major blow to your ego, you feel like a failure, they would be of that age group that they’d feel like a failure. [Alcohol Liaison].

A psychiatrist also spoke about shame, especially in regard to those older adults who may have lifetime depression. The psychiatrist believed that they become ashamed because they feel they should have gotten over their depression by this point in their life, and by not doing so they have failed. This suggests that the issue of denial is not due to any cultural or generational gap, but something that develops over years of recurring depression. This makes it a possible reason for denial once the person has a history of lifetime depression.

If a person lives with depression for a significant number of years their positivity about depression and its prognosis may become a sense of frustration, which may turn to shame:

> I think perhaps there's maybe a bigger sense of shame. [Researcher: "Compared to?"] To younger people, a sense they want to hide it, they're not as conversant, and they're no longer interested in getting over it. There's more sense of maybe, just a quiet sense of frustration about it, again, a bit of helplessness comes along. If you're still getting depressed through adulthood into old age, you know it's pretty frustrating. [Psychiatrist 3].

This shame and frustration may also play into the depression itself, making it an integral aspect of depression in the older age group, especially if the patient had a history of it. The same psychiatrist above used the term "justified hopelessness," and "hopelessness" [Psychiatrist 3]. This may feed into their older adult patients depression in the way that learned helplessness does: "…essentially, a sense of justified hopelessness, you know you're getting older and particularly there's recurrent stuff, like I haven't beaten this yet, and, sense of defeat, yeah." [Psychiatrist 3].

Denial of harmful drinking. The second subtheme of denial illustrates how the interviewees' believed that their older adult patients' denial of drinking may maintain it. When asked to describe the characteristics of older adult patients who have depression and who engage in harmful drinking, the interviewees again reported that patients might be in denial or will try to hide their drinking. One possible understanding for this denial is that they may have strayed into drinking harmfully after retirement. Similar to somatisation in

depression, this may indicate more of an unconscious level of denial. Their straying into harmful drinking could be compounded by the fact that, as one GP noted, unlike in pubs and bars, people don't measure their alcohol use in their home: "I mean most people at home do not use measures." [GP 1]. As a result, they may disbelieve that they could be drinking that much:

> They'll often be in denial, they'll often be people who would have maybe drank, maybe in and around the limits for a while, maybe occasionally, but then they're retired they're a bit bored or they're socialising more. Or they don't have as many responsibilities, so they'll find they're drinking more in the middle of the week is how it often will go. So they'll tend to drink more regularly, they'll tend to sort of drink at other times, you know drink at lunchtime. [GP 2].

This disbelief was one way through which the doctors and nurse believed that older adults with depression and harmful drinking might deny their drinking, perhaps particularly for those who do not have a history of it. But as with depression, there is unconscious denial and a more conscious denial. For the purposes of analysis these are being discussed as separate entities, but the likelihood is that there will be shades of each in many of these cases. One psychiatrist mentioned there can be an aspect of shame around drinking, which may not differ too much from adult patients:

> I guess there would be more an element of denial in, as there would be with adult patients too… trying to deny their way through things, again there'd be a shame around the alcohol misuse as well…[Psychiatrist 3].

When the GPs and psychiatrists believe their patient is drinking over the recommended guidelines or to an extent that may be harmful to their health, all

said that they would advise their patient to reduce their consumption. However, as many of their patients are likely to deny their drinking, they are careful to create rapport, and avoid invoking shame when asking about their consumption. "…a little bit of rapport building as well, you know, 'we all tend to drink more when we're under stress,' you know, the questions that don't invoke shame…" [Psychiatrist 3].

Patients, particularly those who have depression, can be "difficult to manage in those sort of circumstances" [Psychiatrist 1]. The patient's response to being advised to reduce their drinking "…depends on where they are in their journey." [Psychiatrist 2]. Those who are in the "…depths of denial…" [Psychiatrist 2] may not agree to reduce. They may instead be "…minimising the problem, minimising the impact that the alcohol could have on the mood, or the anxiety, or depression." [Psychiatrist 4]. For the most part when their doctor suggests reducing their consumption, "[the older adult patient will] usually agree with it, actually." [GP 1]. Their behaviour however is not always in accord with this agreement.

The doctors and nurses reported that while reducing alcohol consumption almost always results in the improvement of depressive symptoms, it was difficult to get their patients to reduce their drinking. A psychiatrist admitted that reduction is not too common in this group of patients:

> Well you would hope that it actually helps the symptoms and it helps the mood to, to, get to a better level, although I have to say that em I probably don't see a lot of that. [Psychiatrist 4].

Denial as a way to manage depression, harmful drinking, and thus poor physical health. The third subtheme of denial illustrates how, according to the interviewees, older adult patients who are in denial of their depression and harmful drinking may also be in denial about the effects of their drinking and depression on their physical health. This is pertinent because the three were perceived to have a reciprocal relationship:

> …you've now got two comorbidities, so depression can affect your overall physical health, and your cognitive function, and alcohol can affect your overall health and cognitive function. When you combine the two together, then things accumulate and multiply, and can lead to… more social isolation, being at home, less mobile, poor diet… [Psychiatrist 5].

This subtheme may also explain the findings in the quantitative analysis of this thesis where harmful drinkers who did not reduce their drinking had the highest percentage of participants who rated their health as excellent, and the second highest rate of those with a limiting long-term illness. The health practitioners suggested that older adults who have depression and who are in denial about their harmful drinking may also be in denial about the effects of this consumption on their health. This denial may be similar to the denial of depression due to somatisation and the denial of harmful drinking and inadvertently straying into these increased quantities of alcohol consumption, where the patient is unaware of the reduced status of their health in relation to others of their age. If the older adult is not fully aware of their alcohol use, they may also be unaware of its effects, including those on their health:

> I'd say some would have an insight into their poor physical health, I'd say others might not really have any insight. I think if they have poor insight into their alcohol use and the effects of their alcohol use, they might not kind of be aware of the effects on their physical health. [Psychiatrist 5].

The presence of cognitive impairment, an issue believed by the health practitioners to be likely in the oldest-old, may also play a role in an older adult's lack of insight into their physical health and harmful drinking. And, as mentioned by the alcohol liaison nurse and a number of psychiatrists, cognitive impairment can arise due to a history of harmful drinking. It is likely that in many cases there is a combination of a lack of insight along with a conscious denial of the reality of their drinking and the effects of it on their health:

> …they may be not good and ignoring of it, and maybe choosing to ignore it… and then you also have people who might be cognitively impaired… And so actually just thinking back on a number of cases I've had recently where alcohol—I think that's actually the way it is that they don't admit or they don't see that they have problems you know, that they don't see they're different to, you know, people doing the Camino at 70. [Psychiatrist 1].

One psychiatrist believed that the attitude toward alcohol and patterns of alcohol use in Irish society is associated with a feeling of stigma around harmful alcohol use: "…because it is so easily available, and so much a part of society and, and patterns within society, I do think that—and also the negative and the stigma that… an alcohol problem or dependency could have. Yeah, people tend to minimise it…." [Psychiatrist 4]. As a result older adults were

thought to minimise their harmful drinking and its effects on their health to avoid stigma, whether consciously or unconsciously. While the conscious denial of depression in this population appears to be mostly due to issues of shame and stigma, the conscious denial of harmful drinking may have an additional reasoning behind it. It can be a way of maintaining their harmful drinking, especially for those who have a history of it. For those who have depression and who consciously deny their drinking, this denial can extend to its effects on their physical health, as to admit to feeling poorly might bring their drinking into focus.

> …I think some of them, particularly if they've managed their alcohol through denial, they'll be in denial about their physical health, so it depends, you know, so some of them will and that's people who've been drinking a long time and just totally deny they've been drinking too much. [GP 4].

An issue particular to harmful drinking and its effects on health in older adults is the tendency to blame these effects on their increasing age rather than the alcohol consumption itself. For those who do rate their physical health as poor they won't relate this to alcohol. "…they would never, never mention alcohol and mood and health in the same sentence." [Alcohol Liaison]. Instead they may attribute their poor health to the ageing process. This attribution may be conscious, unconscious or, as is likely, a combination of the two.

> Again, it depends on the state of denial I suppose,, "ah sure I'm getting older anyway I'm slowing down." They'll rarely say I'm destroying myself with drink, so they'll rate it, their physical health better—they'll

> rate their physical health badly possibly, but they won't factor in the role alcohol would play in it. [Psychiatrist 3]

The tendency to attribute the effects of harmful drinking to ageing was not limited to the older adult themselves. The alcohol liaison nurse recounted an episode in which an older man hid his drinking from his adult children. The nurse mentioned how in this case, and others, relatives, those close to older adults, and health practitioners themselves may also attribute the person's behaviour such as poor coping strategies, poor cognitive ability and lack of appetite to the ageing process rather than considering the possibility of their drinking. This could be said to be a form of subtle ageism:

> …people as well associate older people with cognition, poor, less, not better coping strategies, are they eating as much? Nobody would be investigating are they drinking that much. And they'd say, oh their appetite, well older people don't eat that much, and oh, older people don't sleep that much, or sure isn't he dozing in his armchair all day. [Alcohol Liaison].

In the interviewees' experience, denial was a prominent theme among their older adult patients. It was useful to identify the differing forms of denial, from that resulting from poor insight due to somatisation in cases of depression, and straying into harmful drinking patterns, to more conscious forms of denial where the older adult repudiates the reality of their situation. For the older population, admitting to being depressed appears to equate to admitting to being a failure. While there have been many public awareness campaigns about mental health directed to a younger audience, there has been

less attention directed to the older adult. This may explain the continued stigma around depression in this age group.

Summary

Loss, whether it was the stress of accumulated of losses, or the loneliness that results from these losses, was believed by the interviewees to play a role in the development of depression in their older adult patients. It could even play a part in the nature of older adult depression, in that the accumulation of losses wears on the person, resulting in a depression which is characterised by a lack of emotion. Loss of one's role in life and the loss of structure that comes from retirement may also play a role in a form of depression prevalent in this population characterised by a loss of meaning.

Once their patient's depression develops, participants reported that the older adult may then begin self-medicating it, leading to drinking over the recommended guidelines. Or they self-medicate the stress from these losses which leads to drinking beyond recommended guidelines and into harmful drinking, which results in depression and begins a "vicious cycle." This was one of the roles that alcohol appeared to play in older adult depression. The lack of structure in the older adult's day, post-retirement, also was also reported to result in their patients straying into harmful levels of alcohol consumption. This harmful drinking could then lead to depression.

While the theme of Loss might explain how the depression and harmful drinking association develops in this population, the theme of denial explains how it might be maintained based on the experience of the interviewees with this patient population. Many of the older adult patients were in denial of their depression. This denial was either unconscious, perhaps because of the somatic

symptoms they were experiencing, or it was more conscious. This conscious denial was often due to stigma and shame about being depressed, or not having successfully rid themselves of lifetime experiences of depression.

Denial of harmful drinking was also conscious or unconscious. When, as participants reported, a person strayed into harmful drinking after retirement, they may be unaware that they are drinking heavily and refuse to acknowledge it. Or they have a history of drinking and are ashamed of it, and are using denial as a way to maintain it.

Those who have depression, and who drink harmfully, but are in denial of their drinking, and/or their depression, may also be in denial about the alcohol's effects on their physical health. As a result they may continue drinking until somebody discovers it, or until they acknowledge the reality of their situation and seek help. Ageism may be a factor in this maintenance, either on the part of the person themselves, or from their family or even health practitioners, each of whom may attribute the effects of the harmful drinking or even the symptoms of the person's depression on the ageing process.

The theme of denial is particularly interesting when it is used as a lens to understand the quantitative findings on depression and harmful drinking. From the unadjusted statistical analysis, having threshold depression was not associated with drinking harmfully. However, when those who rated their physical health as poor was controlled for, the association became significant. This suggests that harmful drinking results in or causes poor self-rated health, and this then leads to threshold depression. In the multivariate analysis, this association lost significance suggesting that other factors are involved. However, when those who reduced their drinking in the past two years were

controlled for, the harmful drinking and threshold depression association was significant. It may be that those older adults who do not reduce their harmful drinking were in denial of their alcohol consumption, and possibly its effects on their physical health. This denial may then lead to depression in the following way.

Older adults in denial of their drinking may be less likely to reduce their consumption. According to the interviewees, they could also be in denial of its effects on their physical health, and so would rate it as better than they objectively should. This then might become a way of continuing their drinking, and the combination of these factors, harmful drinking and poor physical health, may then lead to their having depression.

Thus the perspective of the health practitioners interviewed was that loss is a significant source of depression in late life. This can also lead to the co-occurrence of depression and harmful drinking. The role of alcohol in the older adult patients of the interviewees was that it could be used to self-medicate these losses, whether they were loneliness, loss of meaning in life, or losses of physical health. Additionally their patients could stray into harmful drinking which they believed would then result in the development of depression. Their patients with a history of harmful drinking were believed to increase their consumption when they retired, and this then would lead to depression, possibly in conjunction with the stress of the loss of a career or the other losses discussed.

In the interviewees' experience denial was a large factor in their patients regarding depression, harmful drinking, and the effects of harmful drinking on their patient's physical health. It was perceived that denial could

maintain each of these factors. And that each factor could perpetuate the other in a “vicious cycle.”

Table 29.

Joint display of association between threshold depression and harmful drinking

Quantitative analysis	Qualitative analysis	Meta-inference
Logistic regression for variables predicting threshold depression	Loneliness theme	Loneliness theme
Threshold depression Exp(B) Harmful drinking and didn't reduce in past 2 years. 4.90*** UCLA Loneliness 1.14*	"Because loneliness is depression." [Psychiatrist 3] "A lot of people who drink in late life can maybe do so through loneliness and the loneliness may have brought on a depression because loneliness is a stress." [Psychiatrist 1] "…social isolation and loneliness I would say is the biggest thing I would see, which again would be feeding into the depression which again would be feeding into all the reasons why they drink, it's like a spiral." [Alcohol liaison nurse] "…it may be for example somebody was a pretty heavy drinker all their lives, never ran into depression in their adult life, and then when retirement came along, thinking of people I know, there was a lot more time for boozing, and the depression would come." [Psychiatrist 3]	Loneliness is significantly associated with threshold depression in older adulthood. Usually the loneliness precedes the depression. The individual then self-medicates their loneliness/depression with alcohol leading to harmful drinking. The two factors perpetuate each other, resulting in the person not reducing their harmful drinking.

Table 29. (continued)

Logistic regression for variables predicting threshold depression		Denial theme	Denial theme
	Threshold depression	"…I think some of them [older adults with depression and misuse], particularly if they've managed their alcohol through denial, they'll be in denial about their physical health, so it depends, you know, so some of them will and that's people who've been drinking a long time and just totally deny they've been drinking too much." [GP 4]	Older adults who have depression and who drink harmfully may be in denial regarding their depression, their drinking and the effects of their drinking on their physical health.
	Exp(B)	"Well you would hope that it (reducing consumption] actually helps… although I have to say that I probably don't see a lot of that." [Psychiatrist 4]	
Harmful drinking not reduced in past 2 years.	4.90***	"I'd say some would have an insight into their poor physical health, I'd say others might not really have any insight. I think if they have poor insight into their alcohol use and the effects of their alcohol use, they might not kind of be aware of the effects on their physical health." [Psychiatrist 5]	This denial may be conscious or unconscious. Their continuing denial maintains their depression and harmful drinking, and physical effect of this drinking. As a result those older adults who are depressed and who drink harmfully are those who do not reduce their drinking. They may deny their depression, drinking, and/or poor physical health, thus perpetuating the cycle of drinking, depression and poor health.
Fair to poor self-rated health	2.59***		
A long term illness	2.53*		
Having functional limitations	1.25**		

*p< .05. **p< .01. ***p < .001.

Chapter Seven: Discussion

This chapter begins with a discussion of the quantitative findings from chapter five, followed by a discussion of the qualitative findings from chapter six, in relation to the current literature. This final chapter will integrate the findings of the two phases, and frame these using Lazarus and Folkman's (1984) transactional theory of stress and coping. Methodological issues and limitations will then be considered, as well as the strengths and contributions of this thesis to the older adult mental health literature, both quantitative and qualitative. This chapter, and thus the thesis, will conclude with directions for future research, and recommendations for clinical practice.

The quantitative associations between threshold depression, subthreshold depression, and GAD, with alcohol consumption were as follows: first, drinking moderately was a protective factor against having GAD, in that reduced GAD was associated with moderate drinking. Second, those who drank at harmful levels were significantly likely to have threshold depression. Third, no category of alcohol consumption was associated with subthreshold depression.

As reported in chapter three, other factors associated with having threshold depression were loneliness, poor self- rated health, a long-term illness, functional impairments, a low quality of life, neuroticism, and having GAD. Having subthreshold depression was associated with having GAD and a poor quality of life. In addition, being extraverted, and having excellent self-rated hearing were protective factors against having subthreshold depression.

Further factors associated with GAD were being female, poor quality of life, subthreshold depression, conscientiousness and neuroticism.

The objectives for the qualitative analysis were developed from the quantitative finding that harmful drinking is a predictor for threshold depression. These objectives were to explore the perspectives and beliefs of health practitioners regarding older adult mental health and alcohol consumption, and to explore their perceptions of the role of alcohol in older adult depression. In addition, further associations with GAD and depression led to other areas to be explored. Two themes emerged from the qualitative interviews: Loss and Denial.

In the Loss theme, losses common to late life appeared to lead, first, to depression on its own, secondly to harmful drinking, and thirdly, to the co-occurrence of depression and harmful drinking in the interviewees' patients. Three subthemes emerged in this Loss theme illustrating how the losses related to depression and harmful drinking. These were loneliness, loss of meaning in life, and loss, depression and harmful drinking

The Denial theme also had three subthemes. These were denial of depression, denial of harmful drinking, and denial as a way to manage depression, harmful drinking, and thus poor physical health. The theme of Denial illustrated this as a way through which the interviewees' older adult patients appeared to maintain their depression, their harmful drinking, and the co-occurrence of drinking and depression.

Threshold depression

For the threshold depression model, twenty three variables were included. Nine of these were significant. Aside from harmful drinking that

hadn't been reduced in two years, the remaining eight predictive factors have previously been reported in the literature: poor self-rated health (Chang-Quan et al, 2009; Hansen et al, 2016;), a long-term illness (Bosque-Prous 2016; Carvalho et al, 2018), functional impairments (Bruce, 2001; Peltzer & Phaswana-Mafuya, 2013; Weyerer et al, 2013), a low quality of life (Peltzer & Phaswana-Mafuya, 2013), loneliness (Cacioppo et al, 2006), neuroticism, extraversion (Koorevaar et al, 2013), and having GAD (Middeldorp et al, 2005).

Those who drank at harmful levels, and hadn't reduced this level of consumption in two years, were significantly likely to have threshold depression. At-risk drinking did not predict this form of depression. This finding partially accords with previous research where at-risk drinking was mostly not predictive of threshold depression (Osborn et al, 2003; Koster et al, 2006; Hoeck & Van Hal, 2012; Peltzer & Phaswana-Mafuya, 2013; Weyerer et al, 2013). Whereas measures such AUDIT, or SMAST or DSM criteria for AUD which assess for problems arising from consuming this quantity of alcohol were more likely to be predictive (for example: St John et al, 2008; Kim et al, 2014; Laborde-lahoz et al, 2014; van den Berg et al, 2014;). However, this was not a definitive trend; Coulson and colleagues (2014) found at-risk drinking to be a risk factor in a sample of men, but unlike the majority of studies on this topic, women were not included in the sample. Iparraguire and colleagues' (2015) study was the only one identified to measure for harmful drinking, and while this was the dependent variable, some variables were controlled for (cultural engagement, religion, and caring responsibilities) which were not included in the current study. These might explain the lack of

association compared to this thesis' findings as cultural engagement is a protective factor against older adult (50 and over) depression (Fancourt, & Tymozuk, 2018), as is religion (in those aged 65 and over) (Braam et al, 2001). Religiosity may provide coping resources that protect against the development of depression (Jang et al, 2005) this may also be the case for cultural engagement and caring responsibilities, indeed the latter is associated with lower levels of drinking in women aged 50 and over (Iparraguire et al, 2015).

As previously mentioned, two factors were found to play significant roles in this association: self-rated health, and whether or not a participant had reduced their alcohol consumption within the past two years. The role of self-rated health inconsistently mediating the threshold depression and at-risk or harmful drinking association was a further possible trend identified from the literature (Perreira & Sloan, 2002; Merrick et al, 2008; St John et al, 2008; Kim et al, 2015; Bosque-Prous et al, 2016; Hansen et al, 2016; Mowbray et al, 2017). Fair to poor self-rated health did inconsistently mediate the association between harmful drinking and threshold depression in this thesis at bivariate level. This means that harmful drinking was associated poor self-rated health and that poor self-rated health was associated with having depression. To my knowledge, this is a new finding in the literature on older adult depression and harmful drinking.

Poor self-rated health was one of the stronger predictors of threshold depression in this thesis. Among older adults, poor-self rated health may be more predictive of poor mental health than physical health, particularly in those aged 75 and over (Schnittker, 2003; Chang-Quan et al, 2009). It is possible that the majority of participants in this thesis (aged 65-74) may be

referring to their physical health and/or their mental health when answering this question. This is further complicated by high rates of physical health comorbidity in this population (Blazer and Hybels, 2005). Functional impairments were also predictive of threshold depression in this thesis, and are known as one of the more important causes of depression in this age group (Bruce et al, 2001; Chang-Quan et al, 2009), and have a reciprocal relationship with depression (Hajek, and Konig, 2016). Finally, as self-rated health is a dynamic judgement which does not always correlate with objective health (Benyamini, 2011), it may be that this is an indicator of a person's resources for coping with stress, such as optimism (Ruthig et al, 2011). This would suggest that whatever coping resource it is that self-rated health indicates, this is the factor that mediates between harmful drinking and depression in this population. This would also explain the indefinite trend of self-rated health's mediation as deduced from the literature review.

Regarding the relationship between self-rated health and drinking, previous research suggests it can be positive or negative (Moos et al, 2009; St John et al, 2008; McKenzie, Carter, and Filoche, 2014; Bosque-Prous et al, 2016). Older adults with health problems tend to reduce their consumption, however those with a significant health burden (including chronic health conditions, depressive symptoms, medications and acute health events), as well as those who use alcohol to self-medicate pain, are at an increased risk of alcohol problems over time (Moos et al, 2009). Additionally, adults aged 65 and over who rate their health as fair to poor are likely to engage in at-risk drinking, and to binge drink (Kirchner et al, 2007). This suggests that older adults either reduce their drinking due to poor health, or they use alcohol to

cope with the stress of increasingly poor health, such as having a long-term illness or functional impairments, both of which were predictive of threshold depression in this thesis. Or, indeed, they may be self-medicating depressive symptoms.

The second strongest predictor in the multivariate analysis was harmful drinking, but only when reduced alcohol consumption/did not reduce was controlled for. Specifically, participants who drank harmful quantities of alcohol and who did not reduce their drinking in the past two years i.e., continuing harmful drinkers, were likely to have threshold depression. An exploratory analysis of associations between physical health variables and categories of alcohol consumption was conducted to help clarify these results. Categories of consumption were divided between participants who had recently reduced their consumption and those who had not. Examples of these categories would be harmful drinkers who had reduced their drinking in the past two years, or at-risk drinkers who had not reduced their drinking in the past two years. In total, there were seven categories.

Of all seven categories, the highest percentage of participants with excellent self-rated health were those who drink harmfully and who had not reduced their drinking in the past two years. Further, the only group of participants who had a higher prevalence of limiting long-term illness than harmful drinkers who had not reduced their drinking were those who don't drink. The finding that this latter category of participants often continued their harmful drinking may be explained by Moos et al (2009) finding that those with significant health problems are likely to increase their alcohol consumption over time. This may be due to their self-mediating their health

problems. That the former category (continuing harmful drinkers) who rated their health as excellent, may be explained by the survival cohort effect, i.e. that those adults more vulnerable to the effects of harmful consumption will have reduced their consumption or died from its effects leaving those who are less vulnerable. It may also be the case that some harmful drinkers who had not reduced their consumption may not be completely truthful in the rating of their health. They may, as discussion of the qualitative findings later suggest, be in denial. Further discussion of this finding will be integrated into the discussion of the third subtheme of denial.

Subthreshold Depression

When examining the factors associated with subthreshold depression, two factors were predictive: having GAD and a poor quality of life. A further two, being extraverted, and having excellent self-rated hearing were protective factors. Notably, the main factor under examination, alcohol consumption, was not predictive. This null finding marks an interesting contribution to the literature on older adult mental health. Previous research has found that subthreshold depression does not appear to be associated with any category of alcohol consumption (Rodriguez et al, 2010; Kim et al, 2014; Laborde-lahoz et al, 2014; van den Berg et al, 2014). This thesis furthers this finding in the 65 and over population while controlling for a large number of socio-demographic, psychological, and physical health related predictors of subthreshold depression. In addition, the significant predictors (such as having GAD (Pietrzack et al, 2013), and a poor quality of life (de la Torre-Luque et al, 2019), and the protective factors of being extraverted (Janowsky, 2001), and

having excellent self-rated hearing (de la Torre-Luque et al, 2019) concur with the literature in this area.

It was also interesting that self-rated health was not a multivariate predictor of subthreshold depression. As Leibson and colleagues (1999) note, the presence of other physical health variables in the multivariate analysis may have resulted in this lack of multivariate significance. That self-rated health remained significant for threshold depression but not subthreshold depression in this thesis might be explained by the finding of Schnittker (2003), that the association between self-rated health and physical health weakens with increasing age. Thus, poor self-rated health may be indicative of threshold depression in older adults, but not subthreshold depression. This could be a contributing factor in the lack of significance between any form of alcohol consumption and subthreshold depression, as self-rated health inconsistently mediated the initial alcohol and threshold depression association. More research is required to discern the context surrounding this lack of significance.

The finding that abstinence from alcohol was not associated with subthreshold depression is contrary to the available literature in this area (van den Berg et al, 2014). It has been suggested in the past that abstinence is associated with depressive symptoms because people may not drink for health reasons, and/or their not drinking means they have a smaller social network, and that it is these factors rather than abstinence that is associated with depression (Lucas et al, 2009). However, this does not explain the lack of findings in this thesis, as there was no significance found in either bivariate or multivariate analysis. It may be that the many of the abstainers in this sample are life time abstainers, as older adults who have always abstained from

alcohol have a low likelihood of having depression (Mari et al, 2015). The measure used in this theses' analysis measured for abstinence in the last 12 months. Further research is again required to discover the nuances in the abstinence and subthreshold depression relationship in this age group.

Considering the high rates of somatisation and disability in older adults who have subthreshold depression (Blazer, 2003; Rodda et al, 2011), it is of interest that only one physical health related variable was associated with subthreshold depression in the multivariate analysis: having excellent self-rated hearing was associated with lower levels of depressive symptoms. While most of the study's health related variables were significant in bivariate analysis, all, apart from self-rated hearing, lost significance in the multivariate analysis. Poor self-rated hearing has a stronger association with depression than objectively poor hearing (Keidser et al, 2015). As Keidser and colleagues (2015) note, it is likely that personality traits and pessimism colour this association more than the effects of objective hearing loss.

GAD

In the regression model for GAD, there were 24 variables, six of which were significant. As found in previous research on GAD, being female (Grant et al, 2005), having subthreshold depression (Pietrzack et al, 2013; Laborde-Lahoz et al, 2015), poor quality of life (Shrestha et al, 2015), and the personality traits of conscientiousness and neuroticism (Hale et al, 2010; Rosellini & Brown, 2011) were predictive of having GAD.

Moderate levels of drinking significantly predicted lower levels of GAD. This is a new finding in the association of moderate alcohol consumption with mental health in older adults. This supports previous work

by Bellos and colleagues (2013) in a sample of younger adults aged 18-64 using data from WHO, and the findings of Ivan and colleagues (2014) in which any alcohol consumption (excluding participants with alcohol abuse) had been associated—though not significantly so—with lower levels of GAD in older adults. Additionally, in the latter study, few confounders were controlled for. This study is the first to find moderate use to be protective against having GAD in an older adult population. Due to the large number of confounders (socio-demographic, physical and psychological factors) included in the model, this finding is particularly definitive.

Moderate drinking being associated with lower levels of GAD provides some support for the middle of the U shaped relationship between anxiety and alcohol consumption (Skogen et al, 2009), as applied to an older population. It may be that drinking moderately reduces stress which results in lower levels of GAD, and so it is used a form of coping. Moderate drinkers have previously reported that alcohol makes them feel calm (Cooper et al, 1995). However, while this may seem that it would be advisable to drink moderately as a protective measure against GAD, it is likely that moderate drinkers are predisposed to drink moderately, due to either good mental health, genetic factors, or other, factors (El-Gluebaly, 2007). Further to this, using alcohol to self-medicate mental health is more strongly associated with relatively higher levels of consumption than moderate drinking (Immonen et al, 2010b), while using it to self-medicate GAD in particular is predictive of developing depression, increased distress and suicidal attempts and ideation in a general adult population (Bolton et al, 2006). It may be that moderate drinking is an indicator of a lack of anxiety, rather than a method of reducing it.

Regarding the lack of significance between GAD and harmful drinking, previous research indicates that AUDs are predictors for GAD in younger, and more general adult populations (Burns and Teesson, 2002; Alegria et al, 2010; Marmorstein et al, 2012), and problem drinking is a predictor for females aged 50 and over (Carvalho et al, 2018). No studies, however, could be found to assess whether harmful drinking on its own, i.e. a high amount of alcohol consumption without any additional indicators that this consumption is problematic, is predictive of GAD in this population. This is a new finding in the literature.

Whilst alcohol consumption has a biological dose-response relationship with a number of physical health problems (Ferreira, & Weems, 2008; Rehm et al, 2010), its relationship with mental health is unlikely to be purely biological but may be due to a combination of biological factors and psychological factors such as coping styles, and vulnerability to poor mental health. While anxiety was referenced by the interviewees in the qualitative analysis, it was not a focus of the interviews, and did not develop into a theme.

In accordance with previous research on personality traits associated with GAD in general adult populations (Hale et al, 2010; Rosellini & Brown, 2011), neuroticism and conscientiousness were significant predictors for GAD in this thesis. While there is an association between GAD and higher levels of neuroticism (Mackintosh et al, 2005), GAD's association with conscientiousness is less clear (Kotov et al, 2010). Rosellini and Brown (2011) note that qualities associated with conscientiousness, such as a tendency toward perfectionism and intolerance of uncertainty, map onto uncontrollable worry, which is the core symptom of GAD and which might explain this

association. Additionally, the reasoning behind this positive association in older adults may be explained by the frequent comorbidity between GAD and physical health in this age group (Beekman, et al, 2000; Smit, et al, 2007; Parmentier et al, 2013), which could result in this uncertainty.

A fourth exploratory logistic regression was conducted to assess the association of co-occurring threshold depression and GAD with levels of alcohol consumption. Of nine variables, three were significant predictors. As previously reported in the literature, neuroticism (Middeldorp et al, 2005), having a poor quality of life (Wittchen, 2001), and having an increased number of functional impairments (Schoevers et al, 2005), were predictive of having co-occurring threshold depression and GAD. There was no significant association for any category of alcohol consumption. This finding is supported by a small study of adults aged 65 and over in Thailand (Suradom et al, 2019), though a larger study found alcoholism was predictive of having this comorbidity in an older population (Mulsant et al, 1996). There were not enough participants with both GAD and threshold depression to include the alcohol consumption variable combined with reduction in this model.

Having both GAD and threshold depression is said to indicate a more severe degree of psychopathology than the presence of either on its own (Schoevers et al, 2005). Previous research indicates that the two exist on a continuum, with anxiety preceding depression (Schoevers et al, 2003). Evidence for this continuum can partially be seen in this thesis' findings. Some of the predictors for combined GAD and threshold depression in this thesis were the personality trait of neuroticism, and poor quality of life. Both of these factors have previously been found to predict co-occurring GAD and threshold

depression (Lamers et al, 2012; Zhou et al, 2017). That neuroticism and poor quality of life were predictors in this thesis for threshold depression on its own, for GAD on its own and, as mentioned above, for co-occurring threshold depression and GAD, suggests that they share a genetic vulnerability as indicated by neuroticism (Middeldorp et al, 2005), or it could be that neuroticism is indicative of coping styles (Connor-Smith & Flachsbart, 2007), which lead to the development of the two.

As the design of this thesis was sequential explanatory, and as the qualitative analysis was formed from the findings of the quantitative phase, particularly the threshold depression results, the discussion of these results will now be integrated with those of the qualitative results to contextualise the association between threshold depression and harmful drinking.

The integrated discussion will be guided by the two themes that emerged in the qualitative analysis, Loss and Denial, and conceptualised through Lazarus and Folkman's (1984) transactional theory of stress and coping. According to this theory, when a person faces a stressor, they make a primary appraisal in which they determine whether or not the stressor is a threat. A secondary appraisal is made where they evaluate their coping strategies and resources for addressing this threat. The individual continually reappraises the nature of the stressor, and their resources to cope with it. The last stage is coping, where they attempt "to master, tolerate, or reduce external and internal demands and conflicts among them" (p.223, Folkman & Lazarus, 1980). According to the model, appraisal exists on a continuum with approach on one end and voidance on the other. Approach coping comprises active methods of alleviating the stressor, while avoidance coping is essentially the

opposite; the person avoids the stressor, sometimes through the use of denial. Coping is often further classified into cognitive or behavioural coping. The approach—avoidance continuum can be thought of as the focus of the person's coping, while the cognitive—behavioural continuum can be thought of as the method through which the person copes (Lazarus and Folkman, 1984).

It is important to note that this thesis did not measure for, or analyse, appraisal. However, this theory is a useful way of integrating the qualitative findings of this thesis (the themes of Loss and Denial), with the quantitative predictors of having threshold depression (harmful drinking combined with not reducing consumption, loneliness, poor self-rated health, a long-term illness, functional impairments, poor quality of life, neuroticism, and having GAD) around the concept of coping. An overview of this integration can be seen in figures 4 and 5 where these findings are interpreted through the framework of the stress and coping model. Figure 4 illustrates how loss might contribute to the development of depression and co-occurring harmful drinking through the three pathways identified in the qualitative analysis. The pathway toward self-medicating the stresses associated with various losses in older adulthood, or self-medicating the depression that might result from these losses is highlighted using the colour orange. The second pathway whereby older adults might stray into increased drinking due to the loss of structure and or career is highlighted by the colour blue. The third pathway whereby those who had a history of at-risk or harmful drinking increase their drinking due to a loss of structure of work is highlighted in green. Figure 5 illustrates how depression and co-occurring harmful drinking might be maintained through the use of

denial as a coping method. Denial of depression is highlighted using light blue and denial of drinking is highlighted in yellow.

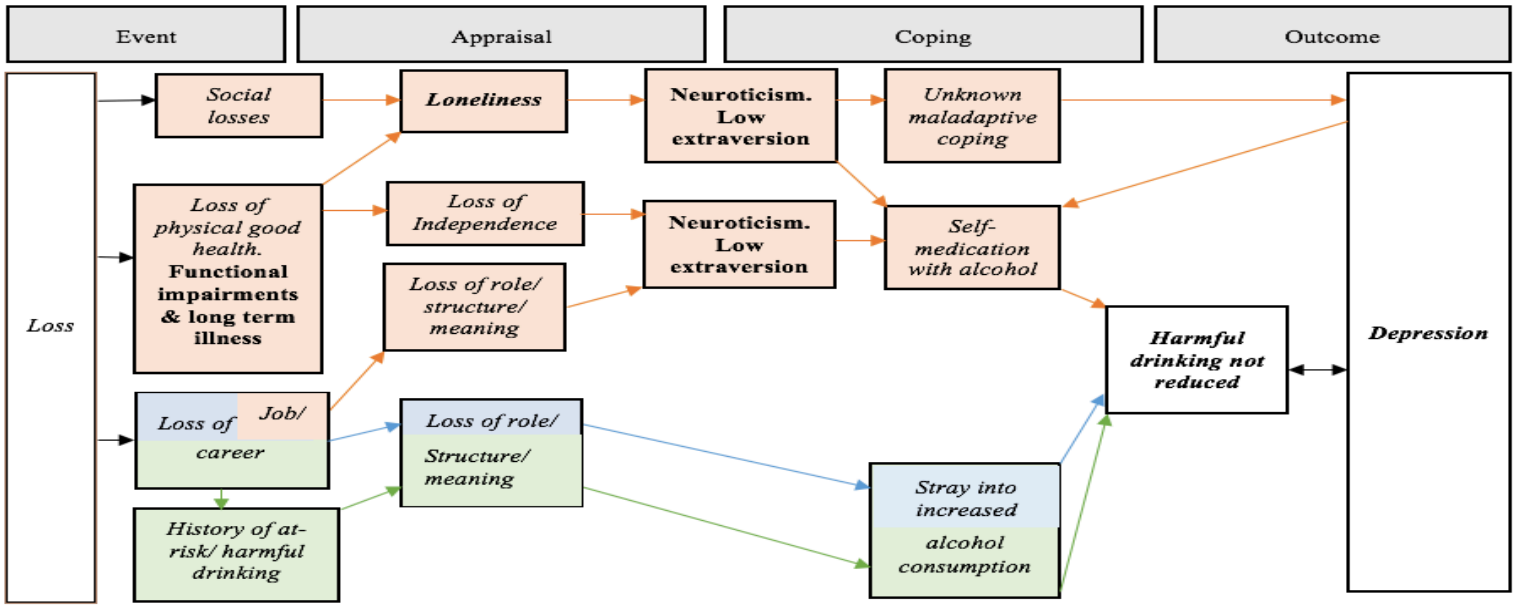

Figure 4. Model interpreting how depression and co-occurring harmful drinking might develop based on integration of Loss theme with predictors for threshold depression. Writing in bold indicates significant variables from the threshold depression regression. Writing in italics indicate findings from the qualitative analysis. Adapted from the Stress and Coping model (Folkman and Lazarus, 1980).

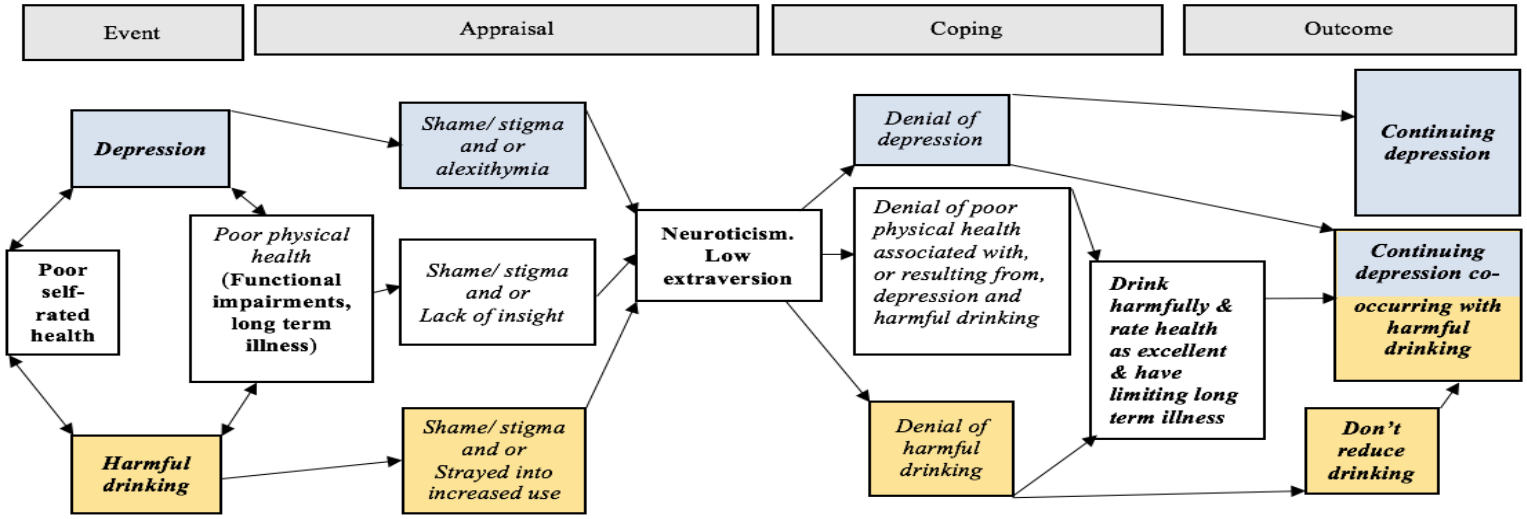

Figure 5. Model interpreting how depression and co-occurring harmful drinking might be maintained through the use of denial as a coping method based on integration of Denial theme with predictors for threshold depression. Writing in bold indicates significant variables from the threshold depression regression. Writing in italics indicate findings from the qualitative analysis. Adapted from Stress and Coping model (Folkman and Lazarus, 1980).

Theme of Loss

This theme focuses on loss and its possible contribution to the development of depression and harmful drinking in the older adult population. Loss has previously been identified as leading to depression by GPs and other primary care practitioners (Burroughs et al, 2006; Murray et al, 2006), and by older adults (60 and over and 75 and over) themselves (Lawrence et al, 2006; Stark et al, 2018). Similarly, healthcare practitioners (Wadd et al, 2011; Britton & Bell, 2015; and each age range of older adults (Aira et al, 2008; Immonen et al, 2011a; Immonen et al, 2011b; Bamberger, 2014; Haighton, 2016) have previously identified loss as leading to harmful drinking.

The three subthemes of loss (loneliness, loss of meaning in life, and loss, depression and alcohol) can be seen as ways through which the interviewees perceived depression and harmful drinking to develop in their older adult patients. Regarding the quantitative analysis, in addition to harmful drinking, loneliness, functional impairments and having a long-term illness were some of the other predictors of threshold depression in the logistic regression which relate to this theme. The quantitative findings on depression and alcohol will be explored in further detail during discussion of the Denial theme.

According to the transactional theory of stress and coping (Lazarus and Folkman, 1984), the appraisal of stressors, such as these losses, in addition to the individual's appraisal of their resources to cope with these stressors, may indicate whether an individual becomes lonely, or depressed, and/or begins drinking at risky or harmful levels, or not. Some losses were related to health:

loss of good health; of functional, and cognitive, ability; of emotion. A further point of resonance between the two phases of the thesis was that functional impairments were predictive of threshold depression. Social losses were loss of companionship, of friends, and of family due to bereavement. Intriguingly, social connectedness was not a significant predictor in the threshold depression model. Previous research suggests that it is only when low connectedness is perceived as a loss, that it becomes a stressor, and thus related to depression (Cornwell, & Waite, 2009). The participants in the quantitative phase of this thesis may have included a greater proportion of people who do not perceive low connectedness to be a loss, compared to the patients encountered by the interviewees. The development of each subtheme (loneliness, loss of meaning in life, loss, depression and alcohol) elaborates on how loss might relate to the development of both depression and at-risk or harmful drinking and how it might lead to their co-occurrence.

Loneliness was a prominent topic in the interviews. Many of the losses experienced by their older adult patients were believed by the doctors and nurse interviewed to lead to loneliness, and depression, as has similarly been reported in previous qualitative research (Lawrence, 2006). As with the doctors' and the nurse's perceptions of their older adult patients in this thesis, these losses were bereavement, loss of good health, of an established role in life, and of social support.

Loneliness is a recognised risk factor for depression (Cacioppo et al, 2006; Aziz & Steffans, 2013). As perceived by older adults it is seen as a part of ageing (Barg et al, 2006), while others (aged 60 and over) will perceive their depression as loneliness (Holm et al, 2013). A study of social workers' and

other healthcare professionals' perceptions of depression in older adults reports that, social isolation, often resulting from bereavement, is the most common cause of depression in older adults (McCrae et al, 2004). It may, in fact, be the most important factor in preventing depression in this population (Blazer, 2005).

Loss of meaning in life was the second subtheme. The interviewees spoke of the lack of structure in their older patients' lives post-retirement. The loss of a career due to retirement was believed to result in depression, as has been previously reported by older adults (Stark et al, 2018). The interviewees in this thesis believed retirement signified a loss of structure, and loss of meaning associated with having a specific role in life. This may be why working has a protective effect against depression in those aged 65 and over (Christ et al, 2007), and why re-entering employment reduces depressive symptoms in this cohort (Maimaris, Hogan & Lock, 2010).

Transitioning to retirement requires renegotiating one's identity (Barnes & Parry, 2004), which brings with it a need to find a new way to meaningfully engage in society and fill the "post retirement void" (p.48, Osborn, 2012). One GP in the thesis reported their shock at how little their patients did during the day, another spoke of their patients' boredom and inability to fill the resulting unstructured expanses of time, which previously had been occupied by their career. The interviewees believed that this related to the loss of a meaningful role in their patients' lives.

A loss of meaning in older adulthood may manifest in depressive symptoms (Lomranz, 2013), while having meaning is negatively correlated with depression (Bergman & Bodner, 2018). A loss of meaning is important in

regard to depression in late life as it has been shown to buffer the impact of stressful events on psychological well-being in those aged 65 and over (Reker, 1994), in other words it is a resource for coping with stress. As an example, meaning in life mediates the relationship between social isolation and perceived loneliness (Yeung, & Fan, 2013). Meaning might be a particularly important resource against these stressors in later life.

The third subtheme of Loss was loss, depression, and alcohol. Three pathways toward co-occurring depression and harmful drinking were proposed from the interviews in the qualitative phase. While the quantitative phase could only measure current drinking, many of the interviewees in the qualitative phase differentiated between early onset and late onset drinking among their patients. The first two pathways concern late onset drinkers while the third concerns those who started drinking earlier in life. In the discussion of the pathways there may appear to be some overlap of findings, however, this was necessary to delineate the subtleties between them.

Pathway 1. The interviewees spoke of their patients using alcohol to self-medicate the stresses associated with the above mentioned losses, and/or the depression that develops from these losses. They suggested that this can result in harmful drinking, a finding that is in line with previous research (Immonen et al, 2011b; Holahan et al, 2003). In a general population, self-medicating depression with alcohol leads to an increase in both depressive symptoms and alcohol consumption (Holahan et al, 2003). They also accord with previously reported reasons for late onset drinking, including coping with depression (Haighton et al, 2018; Haighton, 2016), poor physical health, isolation, boredom, and loneliness (Haighton, 2016), with older adults most

commonly increasing their drinking in response to loneliness and bereavement (Britton & Bell, 2015). If retirement is perceived as a loss, older adults aged 65 and over are also likely to increase their consumption (Bamberger, 2015), otherwise it is associated with a decrease in drinking. This suggests that it is the coping style that mediates the association between stress, such as loss, and an increase in alcohol consumption (Veenstra et al, 2007). It is probable that those who do not perceive retirement as a loss have greater coping resources such as another source of meaning in their lives. The same may be true of the relationship between isolation and loneliness (Yeung, & Fan, 2013).

In addition to these losses developing into depression, as discussed above in the section on the subtheme of loneliness, the interviewees in this thesis reported that depression could also develop due to increased drinking, leading to a "vicious cycle" whereby each increases the other. Similar phrasing was used by the adults aged 50 and over in Haighton and colleagues' (2018) study to describe the nature of the depression-alcohol relationship.

Pathway 2. A second pathway was that of the interviewees' patients not realising that their consumption had strayed over the recommended guidelines because they had begun drinking throughout the day due to boredom, as reported in previous research (Haighton, 2016, Immonen et al, 2011b), or a need to fill the time. This increased consumption was believed by the interviewees to again lead to depression. This may be related to coping as they could have strayed into drinking through, for example, self-medicating with alcohol, however they may also have strayed into harmful drinking through an almost complete lack of insight (Nemes et al, 2004).

Pathway 3. The third pathway was hypothesized to occur in those patients who had a history of at-risk or harmful drinking. The interviewees hypothesized that, due to the structure and responsibilities associated with working, their older adult patients had managed to avoid becoming depressed despite drinking heavy amounts of alcohol. With the stress of retirement, and the ensuing stressors of loss of structure and/or daily companionship, they increased their drinking. This aligns with previous research (Zins et al, 2011; Wang, Seier, & Gallo, 2014). This increase was believed by the interviewees to result in depression. It is possible that those who continue to engage in at-risk or harmful drinking after retirement were those who perceived the event as a loss (Bamberger, 2015) or were experiencing some of the other losses/stressors previously detailed, and have maladaptive coping methods (Veenstra et al, 2007).

As such, the theme of loss, integrated with the findings of the quantitative analysis of threshold depression, revealed the likelihood that maladaptive coping with the stress of losses in the older age group, such as self-medicating with alcohol, can result in the development of depression. It is possible, then, that coping style is a moderator or mediator for the adjusted depression—alcohol association. While this thesis did not control for coping styles, or conduct adjusted mediation or moderation analysis, poor self-rated health did inconsistently mediate this association in an otherwise unadjusted analysis. Further, this thesis did control for personality traits. High levels of neuroticism and low extraversion are associated with mostly maladaptive coping in general adult populations (Connor-Smith & Flachsbart, 2007). In this thesis, neuroticism was a predictor of threshold depression and GAD, and high

extraversion was protective against threshold depression. Self-medicating poor health or depression with alcohol, as was reported by the interviewees, would be an indicator of maladaptive coping. These personality traits and the coping styles associated with them may play important roles in the association between harmful drinking and depression among older adults. This is an area for further study.

Theme of Denial

The second theme developed from the qualitative analysis was Denial. This had three subthemes: denial of depression; denial of harmful drinking; denial as a way to manage depression, harmful drinking, and its effects on physical health in older adults. These can be seen as ways through which depression, and harmful drinking, and/or their co-occurrence, is maintained. These will be discussed and used to contextualize the quantitative relationships between self-rated health, functional impairments, long-term illness, harmful drinking, reducing or not reducing alcohol consumption, neuroticism, extraversion, and depression.

A useful definition of denial is provided by Hackett and Cassem: "the conscious or unconscious repudiation of part or all of the total available meaning of an event to allay fear, anxiety or other unpleasant affects" (p.94, Hackett & Cassem, 1974). Denial is a form of coping. In addition to resulting from stigma, conscious denial is a form of immature defence mechanisms (Segal et al, 2006). While appraisals are often assumed to be mostly conscious, it is necessary to note that Lazarus (2000) emphasizes the importance of unconscious appraisals in the coping process. In each subtheme of Denial, the

interviewees reported perceiving a continuum of conscious to unconscious forms of denial in their older adult patients.

Denial, especially in relation to illness, can be organic or due to a lack of insight, or it can be the more traditional understanding of denial as a conscious defence against distressing information (Goldbeck, 1997). All three arose during the interviews in relation to both depression and harmful drinking, and latterly the combination of having depression, drinking harmfully and having physical health difficulties. The denial of physical health difficulties is particularly relevant due to their strong association with depression (Bruce, 2001; Blazer and Hybels, 2005; Chang-Quan et al, 2009; Hajek, and Konig, 2016). Ageism was also raised by some of the interviewees, particularly with regard to drinking.

They reported that their older patients would attribute the effects of their drinking to ageing, and that this ageism was not limited to the older adults; they saw it occurring in the relatives of their patients, and in fellow health practitioners too. This may explain why harmful drinking is not always recognized in the older population (60 and over), either by the person themselves or those around them (Sorocco & Ferrell, 2006). Ageist attitudes toward older adults who drink at harmful levels, such as believing it is too late to try to change the older adults' behaviour, feeling it to be a taboo subject, or believing that it would not be right to deprive older adults of "their last pleasure in life" have been found among health practitioners (p.660, Wadd & Galvani, 2004). Similar attitudes have also been found among family members of older adults with depression (Perkins & Tice, 1999). Additionally, the alcohol liaison nurse said that, rarely would their patients relate their poor

physical health to their drinking—a finding similar to that noted by Wilson and colleagues (2013)—but would attribute it to the ageing process.

Lack of insight in the case of harmful drinking was illustrated by the interviewees discussing their older adult patients drifting into increased alcohol consumption, often after retirement. The effects of retirement on drinking depend on how retirement is perceived by the person (Bamberger, 2015). Additionally, one of the more common reasons given for increasing alcohol consumption in older age groups is a lack of responsibilities (Britton & Bell, 2015). These may explain how the interviewees' patients strayed into harmful drinking.

Somatic symptoms were prevalent among the older adult patients of this thesis's interviewees, as is commonly found in this population (Hegeman et al, 2017), however it is not known whether these were wholly due to either alexithymia, stigma, an increase in physical health difficulties associated with depression in older age (Blazer & Hybels, 2005; Hegeman et al, 2017), or a lack of insight. One of the psychiatrists interviewed believed that alexithymia, an inability to recognise and verbalise emotions (Taylor, 1984), was responsible for many of their older adult patient's presentations with somatic symptoms when it was apparent that they were actually experiencing depression. This can develop due to cognitive impairment (Onor et al, 2010), but it can also be an enduring personality trait (Salminen et al, 2006).

Alexithymia can also be a form of conscious denial (Helmes et al, 2008), and is associated with high levels of depression severity (Bamonti et al, 2011). Conscious denial was the more common forms of depression denial cited by the interviewees. The interviewees reported their older adult patients'

feelings of shame about being depressed, and the stigma that they perceived. More than 60% of adults living in Ireland perceive stigma around having mental health problems and getting treatment for it (St Patrick's Hospital, 2017). Internalised stigma can lead to lowered self-esteem, hiding of one's condition, or denying one's membership of the stigmatised group (Corrigan, 2004). Older adults with depression who perceive public stigma against depression are less likely to seek mental health treatment (Connor et al, 2010), and are more likely to discontinue treatment than younger age groups, even when levels of perceived stigma are equal between the age groups (Sirey et al, 2001). This was echoed by an interviewee in this thesis who reported that their older adult patients were more likely to seek treatment for physical health difficulties than mental health difficulties. A personal account of the experience of stigma in depression discusses similar issues, including a stigma against antidepressant medication, and a tendency to present with somatic symptoms because "…it is more acceptable to talk of stomach ache and fatigue than mental problems." (p.222, Wolpert, 2001). This suggests that the presentation of somatic symptoms may not be entirely unconscious. Self-stigma may also mediate the association between depressive symptoms and avoidance behaviours like denial, in that avoiding situations in the effort to hide the presence of depression leads to an increase in symptoms (Manos et al, 2009). If older adults are not seeking treatment, and are using denial to cope with their depression they are at risk of other maladaptive forms of coping with their depression, such as drinking. This then can lead to increasing levels of consumption (Windle & Windle, 2015), which may result in harmful drinking (Christie et al, 2013; Gilson, Byrant & Judd, 2017).

As stigma against alcohol problems is highly prevalent, the more conscious forms of denial of harmful drinking were expected (Fortney et al, 2004). And, as Menninger (2002) notes, denial is a hallmark of alcoholism; many older adults are likely to feel shame about their drinking and perceive it as a moral weakness. A qualitative study on older adults in the UK found that their perceptions of themselves were strictly delineated between being either an acceptable drinker, or the "wrong" sort of drinker (p.8, Wilson et al, 2013). The participants in this latter study were largely concerned with being seen as being in control of their consumption; this was a greater concern than the possible effects of drinking on their health, which many saw as being unrelated to their drinking habits.

Just as depression and/or harmful drinking can be maintained through the coping mechanism of denial, the older adult may also be in denial of the effects of their depression and drinking on their physical health. This is important because as suggested by the interviewees, having depression and alcohol problems in older age can increase the likelihood of having physical health problems, which can result in an increase in levels of depression. This is supported by the literature where having both depression and drinking harmfully is associated with worse self-rated disability than either on its own (Oslin, O'Brien, & Katz, 1999). This might then result in a perpetuating cycle of increasingly poor physical and mental health (Hajek, and Konig, 2016), and increased consumption (Moos et al, 2009).

An interviewee suggested that patients with a history of harmful drinking may maintain their drinking through denial, and this denial will extend to the effects of their drinking on their health; this may be especially so

if they want to avoid a perceived stigma of being seen as a socially unacceptable drinker (Wilson et al, 2013). This may explain why, in the quantitative analyses, harmful drinkers had some of the highest prevalences of participants who rated their health as good or excellent, while also having some of the highest prevalences of limiting long-term illnesses in post hoc analysis.

Further to this, adults who use avoidant coping such as denial have a high likelihood of being depressed (Wijndaele et al, 2007; Ottenbreit & Dobson, 2008). Among adults with a functional disability aged 57 and over, those who had a high level of stress appraisal are more likely to use avoidant coping and have increased levels of depression (Landreville et al, 1994). This may explain why, in this thesis, the category of harmful drinkers with depression included a greater percentage of participants who did not reduce their drinking. Reduction can be an indication of successful or ongoing treatment, for either depression, alcohol problems, or both (Oslin, 2005). Those participants in this thesis who did not reduce their harmful drinking may not be receiving treatment, and may be in denial of their drinking and, based on the other subthemes, the effects of drinking on their mental and physical health. It is also possible that they are receiving treatment but not responding to it, or they may be drinking at harmful levels without any ill effects, but this is unlikely (Rehm et al, 2009). As such, this group of drinkers is at risk of depression, poor physical health, or both. An exploratory analysis suggests that this is the case, and also suggests that there may be a particular cohort at risk of these behaviours and this denial. Those who drank harmfully and did not reduce their drinking had an 81% likelihood of being male, and a 71% likelihood of being aged 64-75. This category of drinkers had the highest rate

of smoking, and had the second highest percentage of having a limiting long-term illness (28%), after abstainers from alcohol (31%). It would appear that this cohort specifically may be in denial, whether conscious or not, of their risky behaviours, as they were the second most likely category of drinker to rate their health as excellent. However, as these exploratory analyses were not adjusted, more research is needed to ascertain this cohort's likelihood to be in denial of these risky behaviours.

A finding that may be related to this was that 28% of participants did not complete the alcohol consumption questionnaire (table 9), and this 28% were significantly likely to have threshold depression in bivariate analysis (table 12). While their alcohol consumption is unknown, it would be very interesting to know whether it was at harmful levels. This finding may be, tentatively, indicative of denial.

In the quantitative sample for this thesis, 7% of older adults had threshold levels of depression, yet only 3% of participants reported taking antidepressant medication. This means that, either the other 4% have not yet sought treatment for their depression, or they are undergoing another form of treatment. In the first wave of TILDA, 78% of participants with depression had not received a diagnosis of such (Barrett et al, 2011). Based on these findings, it is possible that stigma and denial play important roles in the under diagnosis of older adult depression. This under diagnosis may be even greater than these figures suggest as older adults with depression have been reported to be less likely to participate in epidemiological studies than those without (Thompson, Heller, & Rody, 1994). The remaining sections in this chapter include a discussion of the thesis' strengths and limitations. Recommendations are made

for future research, and for clinical practice. These are followed by a short autobiographical reflection on the experience of undertaking this thesis. Finally, the thesis concludes with a short summary.

Strengths and Limitations

One of the major strengths of this thesis was the application of a mixed methods sequential explanatory design to the topic of older adult mental health and alcohol consumption. Through the use of this design, the associations of depression and GAD with alcohol consumption were able to be explored, initially, in a large nationally representative sample. The use of TILDA data also meant that a wider range of factors than were included in many of the studies identified in the literature review could be controlled for in these associations. This resulted in more definitive quantitative findings. The qualitative exploration of these findings meant that greater insights into these associations could be made than in a quantitative study. The use of primary and secondary health practitioners as participants in the qualitative phase was a strength in that they had a wide professional experience of older adult patients with both depression and alcohol issues, and so were ideally positioned to contextualize the quantitative findings. Moreover, there has been little research on the perspective of health practitioners on harmful drinking in their older adult patients. The qualitative findings added a valuable contribution in going some way toward explaining the possible role of coping in the depression and harmful drinking association. As such, this may be the first study to comprehensively map the relationships between GAD, subthreshold and threshold depression and the differing categories of alcohol consumption in older adults through the integration of quantitative and qualitative method.

One of the main limitations of this thesis was the cross-sectional nature of the quantitative design, and consequently its inability to assess the main variables' longitudinal relationships, and thus distinguish between primary depression with secondary harmful drinking or primary harmful drinking with secondary depression. The cross-sectional nature also meant that the survival cohort effect could not be controlled for. This is the hypothesis that older adults more susceptible to alcohol may die earlier due to alcohol related illness.

The quantitative analysis did not control for the selection effect known as "sick quitters" where older adults who are abstinent may have been previous harmful drinkers (Shaper, Wannamethee, & Walker, 1988; Alati et al, 2005). In addition, due to the low number of participants with threshold depression, the model for this variable could not fit all of the significant independent factors from bivariate analyses. Low numbers also resulted in condensing the categories of the employment variable which may have shed more light on the qualitative findings. Similarly, due to the alcohol reduction variable sharing the category of abstinence with the alcohol consumption variable, these variables had to be combined so as to be able to control for reduction of consumption. That the dataset refers to 2012-2103 could be considered a limitation as trends may have changed since then, however, as due to the starting date of the thesis, combined with the difficulties in recruiting participants for the second phase, it would not have been practical to study a later phase. This could be considered as a limitation in the sequential explanatory design, as could the inability to recruit from the original population. An additional limitation may be the large percentage of participants (28%) who did not complete the alcohol questionnaire, reducing the number of participants in the multivariate models.

These missing participants may have affected the associations between alcohol consumption and Depression and GAD. A limitation regarding the qualitative phase of the study may be that the perspectives of older adults were not included in the analysis. Rather, the doctors and the nurses' perceptions were provided regarding their experience of their older adult patients. However, the findings in the research suggest that many of these health practitioners' perspectives closely aligned with perspectives of older adults from previous studies. The composition of the qualitative sample could be seen as a limitation, however the aim of this recruitment was to gather perceptions from primary and secondary levels of healthcare so as to gain a fuller picture of the depression and alcohol consumption relationship in the older adult population than could be managed from just one level of healthcare provider. While the sample reflected the inclusion criteria, data saturation may not have been achieved.

Directions for Future Research

A future direction is to control for self-rated health as this inconsistently mediated the association between threshold depression and harmful drinking, and could explain a lack of significance in those studies that do not control for this confounder. Multivariate testing for the mediating effect of self-rated health is also recommended for future research. More specifically, multivariate mediation testing for personality traits and corresponding coping styles in this association is also recommended. Including coping style in analytic models may control for those harmful drinkers who, due to denial, do not reduce their consumption. Additionally, I would recommend researching

the mental health and alcohol consumption relationship from the perspectives and experiences of older adult's themselves.

Future quantitative research on alcohol in older adults should assess for harmful drinking (40 or more drinks per week for men and 28 or more for women) (Drummond et al, 2011). Measuring for quantity of consumption is useful for identifying thresholds of risk and harm. Further, when measuring for harmful drinking, it is useful to control for whether consumption has been reduced, as this reduction may be an indicator that the threshold for harm was breached. To surmount the known limitation of possible under-reporting of consumption (Stockwell et al, 2004), a weekly drinking diary could be used in future research, (Heeb & Gmel, 2005), but this may not be practical for future waves of TILDA.

These findings are promising in that they suggest that decreasing forms of maladaptive coping among older adults may reduce the development of both depression, and harmful drinking. Along these lines future research should aim to develop a screening sheet focusing on the differing symptoms of depression in older adults, in addition to the likelihood of harmful drinking, and their co-occurrence. As suggested by the health practitioners interviewed, the findings of this thesis provide a solid foundation for the development of such a sheet. This is particularly pertinent to Ireland, as Irish adults with alcohol problems are significantly likely to use alcohol as a form of maladaptive coping (Teahan, 1988).

Clinical Recommendations

The quantitative finding that older adults who do not reduce their harmful drinking are likely to have threshold depression, emphasises the importance of improving access to dual diagnosis services for the older adult population. Part of this includes improving diagnosis rates for both depression and harmful drinking. A possible way forward would be the implementation of a model such as the EASE-D model of education, screening and diagnosis (Berman & Furst, 2010). This particular model links community centres and services with the department of health and with GPs, social workers and other primary care practitioners, in addition to psychiatrists. It begins with educating older adults and their healthcare providers on older adult mental health. For the older adults, this is usually done in community centres.

It is important to also educate health practitioners who work with this population on older adult mental health and alcohol consumption among this population. One way to do so may be through talks/education with mental health service users for current medical professionals as part of their continuing professional development on the issue of stigma and other difficulties experienced in the diagnosis process. As the older adult population is growing at a rapid rate, it would be especially beneficial to raise awareness in the coming generations of medical professionals through case studies and inclusion of these issues in their undergraduate education, and postgraduate training.

As mentioned by one of the psychiatrists interviewed, it is recommended that a screening sheet be developed for primary care practitioners, and health practitioners working with older adult populations, on both the typical symptoms of older adult depression and the potential for at-risk and harmful drinking in this population, and their co-occurrence. This may

also be used in the community setting in line with the EASE-D model (Berman & Furst, 2010). The intention would be to improve diagnosis rates, and possibly assist with treatment through the emphasis on the role of maladaptive coping styles in both, and in their co-occurrence.

Continuing with the prescriptions of the EASE-D model (Berman & Furst, 2010), once the education session for the older adults has been completed, voluntary screening should be provided. This would help to avoid anyone feeling targeted or singled out. In addition to screening, clear pathways toward diagnosis could then be provided.

As stigma appeared to be a significant barrier to mental health treatment according to the health practitioners interviewed in the qualitative analysis, one of the GPs interviewed devised a useful method of working around this. When the GP believes that their older adult patient may have depression, but feels a resistance to this possibility, possibly due to stigma, they would present the possibility of the older adult have a mental health problem but rather than insisting on this they would suggest doing tests to rule out physical causes. When the tests come back as negative, the GP then focuses on the cause being a mental health problem. This method provides the patient with a sense of autonomy in the diagnostic process and gives them time to come to terms with the possibility of their having a mental health problem. It cleverly deals with the commonality of somatic symptoms in older adults while working around the barrier that this presents to the patient accepting a mental health diagnosis, and something along these lines could be adapted for widespread use. These interventions may help to raise awareness among health

care professionals for the potential for depression, harmful drinking and their co-occurrence in this population.

The issue of substance misuse among older adults was only recently included as a national policy objective (Department of Health, 2017). These findings are supportive of the need to include the issue of dual diagnosis among older adults in Irish policy as a further objective. In summary, based on these findings it is recommended that education be provided to health care providers of older adults and older adults themselves. Community based mental health screening for older adults would help to combat stigma. These, and the provision of clear pathways to mental health diagnoses may help to improve diagnosis rates in this population.

Autobiographical Reflection

Undertaking this thesis has undeniably helped me to grow as a person, mostly in ways that I am sure I have yet to discern. With hindsight, and distance from the process of writing the thesis up for submission, these should become clearer. What I do know is that it has reinforced my belief that research can be an unpredictable journey, at times surprisingly so, but that this should be embraced, because chance can be a valuable, and mostly underappreciated, co-author in the research process.

For example, in the qualitative phase of the thesis we had initially decided that I would interview participants from the TILDA study, however as discussed in the methods and methodology chapter this was not possible. Participants for this phase were then sought with the assistance of a gatekeeper in the North Dublin community mental health service. Few however could be identified for recruitment. Prominent associations that work with older adults

in Ireland were then approached. These kindly put up posters and advertised the study on social media in an effort to recruit participants, but to no avail. From these difficulties grew the decision to interview health practitioners, who as key informant participants, demonstrated a great deal of insight into the depression and alcohol consumption relationship in their older adult patients. From my analyzing the quantitative data and then interviewing these participants, my knowledge and appreciation of the complexity of older adult mental health and alcohol consumption grew to the extent that I am determined to continue on this particular research journey.

Conclusion

This thesis suggests that older adults who drank at harmful levels and who had not reduced their consumption over the past two years were significantly likely to have threshold depression. Perceived health and coping styles may play important roles in this association. These coping styles might be associated with the personality trait of neuroticism. The trait of extraversion was protective against having threshold depression. Subthreshold depression was not related in any way to alcohol consumption. Protective factors against having subthreshold depression were being extraverted and having excellent self-rated health. Moderate drinking was a protective factor against having GAD.

Integration of the quantitative and qualitative findings suggests that depression and co-occurring harmful drinking develop due to maladaptive coping with the stress of losses common to this age group; an example of such maladaptive coping is self-medicating with alcohol. Integration of the findings further suggests that denial might be a coping method used by older adults to

maintain their harmful drinking, their depression, and the effects of either on their physical health.

The development of a screening sheet based on the findings of this thesis regarding depression and harmful drinking, educational campaigns for depression and alcohol use directed toward health care professionals and older adults, and community screening may go some way to reducing stigma, improving diagnosis rates of depression, and increased identification of at-risk and harmful drinking in this population.

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Appendices

Appendix 1: Ethical Approval Letters

Beaumont Hospital
Ethics (Medical Research) Committee

Chairperson: Professor Gerry McElvaney
Convenor: Dr. Peter Branagan
Administrator:

6th April 2017

REC reference: 17/19

Mr. Hugh Fulham-McQuillan
111 Park Avenue
Castleknock
Dublin 15

To: fulhammh@tcd.ie
cc:

Dear Mr. Fulham-McQuillan

RE: 17/ 19 – Mr. Hugh Fulham-McQuillan (PhD student/TCD) – Measuring and Modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study

Consultant co-investigator: Prof. M. Cosgrave

The above protocol was reviewed by a recent meeting of the Ethics (Medical Research) Committee held on the 17th February 2017. The committee agreed to approve the study as outlined on condition that the work laptop to be used is both password protected and encrypted, noting the data to be collecting is sensitive in nature.

I confirm research ethics committee approval is now in place for this research study to proceed in Beaumont Hospital. I enclose approval documentation for your files.

With best regards

Yours sincerely

IRB Specialist
Ethics (Medical Research) Committee

Beaumont Hospital
Ethics (Medical Research) Committee

Chairperson: Professor Gerry McElvaney Administrator: Gillian Vale
Convenor: Dr. Peter Branagan

ELECTRONIC LETTER

13th July 2018

REC reference: 17/19

Mr. Hugh Fulham-McQuillan
111 Park Avenue
Castleknock
Dublin 15

To: fulhammh@tcd.ie
cc:

Dear Mr. Fulham-McQuillan

RE: 17/ 19 – Mr. Hugh Fulham-McQuillan (PhD student/TCD) – Measuring and Modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study

Consultant co-investigator: Prof. M. Cosgrave

Further to correspondence dated 26th June 2018 (received 5th July 2018), please find enclosed updated approval documentation for this research study.

Please submit a final progress report when phase 2 of this research study is complete.

With best regards

Yours sincerely

[redacted]

Administrator
Ethics (Medical Research) Committee

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Hugh Fulham-McQuillan
111 Park Avenue,
Castleknock,
Dublin 15

Ref: 170103

Title of Study: Measuring and Modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study.

Dear Hugh,

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in February 2017, we are pleased to inform you that the above project has been approved without further audit.

Yours sincerely,

[redacted]

Chairperson
Faculty Research Ethics Committee

Dámh na nEolaíochtaí Sláinte
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Coláiste na Tríonóide,
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Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
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Hugh Fulham-McQuillan,
Doctoral Candidate, and Tutor,
in Psychology,
School of Nursing and Midwifery
Trinity College,
Dublin 2

30th October 2018

Ref: 170103

Title of Study: Measuring and modelling the association between the mental health of community dwelling older adults and alcohol consumption: a mixed methods study.

Dear Hugh,

Further to a meeting of the Faculty of Health Sciences Ethics Committee held in October 2018, we are pleased to inform you that the above project (as amended with the following changes) has been approved without further audit.

To extend the study date to February 28th 2019.

Yours sincerely,

Chairperson
Faculty Research Ethics Committee

AMENDMENT

Hugh Fulham-mcquillan <fulhammh@tcd.ie> Wed, 29 Aug 2018, 14:01

[redacted]

I am a PhD student in the Trinity College School of Nursing and Midwifery studying older adult mental health and alcohol consumption. For the last part of my study I am planning on interviewing approx. 10 general practitioners, in one to one interviews, on their general experiences of older adult patients who have been diagnosed with depression and/or anxiety.

I am currently in my last year of study, on an extension that extends until March. My initial plan to interview psychiatric patients did not recruit enough participants. Thus the extension.

I am now interviewing psychiatrists, and aim to interview GPs too, on their experiences with these patients. I have put in amendments to my ethics approval from Trinity, and Beaumont hospital (where I am interviewing the psychiatrists) to reflect this revision.

Would I require ethics approval from the ICGP to interview GPs?

Thanks,

Hugh

[redacted] Thu, 30 Aug 2018, 09:42

Dear Hugh,

Once your approval from Trinity includes that you will be interviewing GPs then you do not need separate ethical approval from the ICGP.

Many thanks

[redacted]

Research Administrator
Heartwatch Administrator

Irish College of General Practitioners
4-5 Lincoln Place
Dublin 2
D02 XR68

Appendix 2: Participant information leaflet

Participant Information Leaflet

Study title: Measuring and modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study.

Principal investigator's name: **Hugh Fulham-McQuillan**

Principal investigator's title:

PhD student from the School of Nursing and Midwifery in Trinity College Dublin

Telephone number of principal investigator:

Consultant co-investigator's name: **Dr Mary Cosgrave**

Consultant co-investigator's title: **Executive clinical director of the North Dublin Mental Health Service.**

Data Controller's/joint Controller's Identity: Hugh Fulham-McQuillan

Data Controller's/joint Controller's Contact Details:

Email:

Data Protection Officer's Identity: Ms Jennifer Ryan

Data Protection Officer's Contact Details: +353 1 896 2154/8486.

Email: Information.Compliance@tcd.ie

You are being invited to take part in a research study to be carried out in your place of work or place of your choosing.

Before you decide whether or not you wish to take part, you should read the information provided below carefully. Take time to ask questions – don't feel rushed and don't feel under pressure to make a quick decision.

You should clearly understand the risks and benefits of taking part in this study so that you can make a decision that is right for you. This process is known as 'Informed Consent'.

You don't have to take part in this study. If you decide to volunteer to participate in this study, you may withdraw at any time. If you decide not to participate, or if you withdraw, you will not be penalised.

You can change your mind about taking part in the study any time you like. Even if the study has started, you can still opt out. You don't have to give us a reason. The investigator may withdraw your participation in the study at any time without your consent.

Why is this study being done?

This research study is taking place to model the relationship between alcohol consumption in older adults and how this relates to depression and anxiety. These interviews will be used to better understand the findings of a statistical

analysis of The Irish Longitudinal Study of Ageing. I believe this research is important because the mental health and alcohol consumption of those aged 65 and over has received much less research attention than that of younger age groups. This information leaflet is designed to provide you with an understanding of the research before you agree to taking part.

Who is organising and funding this study?

My name is Hugh Fulham-McQuillan, and I am conducting this research as part of my PhD. I am a PhD student from the School of Nursing and Midwifery in Trinity College Dublin. The research is funded by the School of Nursing and Midwifery through a student scholarship. This study has Research Ethics Committee approval from all institutions involved.

Why am I being asked to take part?

You have been invited to participate in this study because you have professional experience with community dwelling patients aged 65 or over who have received a diagnosis of depression and/or generalised anxiety disorder, and who have a history of alcohol consumption, whether moderate or heavy.

How will the study be carried out?

If you are willing to participate, I would like to meet with you for a one to one interview. We shall meet in your place of work or a place of your choosing, at a time that is suitable to you. I will ask you a series of questions on your professional experience with community dwelling older adult patients who have a diagnosis of depression and/or generalised anxiety disorder, and who may consume alcohol. This will take from 40 minutes. In all, I will be interviewing 15 health care professionals in separate one to one interviews.

What will happen to me if I agree to take part?

We will meet in your place of work or a place of your choosing. Our interview will last 40 minutes. I will have prepared a number of questions to ask you. These will focus on your experiences of diagnosing and treating older adults with depression and/or generalised anxiety disorder, and how this might relate to their alcohol consumption. If at any time you feel uncomfortable or decide you would like to stop participating in the study you can do so at any time.

I will ask your permission to tape record the audio from our interview. This is so I can fully engage with what you are saying at the time rather than taking notes. When our interview is finished I will use the recorded audio to type out our conversation. This will be analysed along with the interviews I will conduct with other participants. Your name will not be used in the study. If you mention other names or names of places during our interview I will replace these with false names to protect your confidentiality, and that of your patients.

What are the benefits?

While this research is unlikely to be of direct benefit to you, you might find it beneficial to reflect on this topic. More generally it is hoped that the results of this study will provide a better understanding of the relationship between different types of alcohol consumption and mental health in older adults, and the effects of other factors on these relationships. This may help to increase the diagnosis rates of mental illness in older adults.

What are the risks?

As the interview will focus on your professional experience of treating mental health and alcohol consumption, there is the possibility that you may become uncomfortable when speaking about either of these topics. You may be slightly inconvenienced by having to arrange to meet and spend 40 minutes in the interview.

What if something goes wrong when I'm taking part in this study?

If you feel any discomfort you are free to stop the interview, or take a short break. We will continue the interview only if you feel comfortable doing so. You are free to decide to stop participating in the study at any time.

Will it cost me anything to take part?

There are no fees for taking part. This study is covered by standard institutional indemnity insurance. Nothing in this document restricts or curtails your rights.

Reasons I cannot participate in this study

You cannot participate in this study if you cannot provide informed consent, or you have no professional experience with patients who fit the following criteria:

- Aged above 65.
- Diagnosed with either depression or generalised anxiety disorder.
- Have a history of consuming alcohol.

Is the study confidential?

Your identity will remain confidential. Your name will not be published and will not be disclosed to anyone outside the study group which consists of myself and my two supervisors. A code will be used so that your responses will not be linked to your name. Myself and my two supervisors will be the only people with access to the audio recording from our interview. This recording will be stored in a secure place and not shared with anyone else. The transcript will be analysed and anonymised. Once it has been analysed the audio recording will be deleted.

The transcript of our interview will be stored in a computer protected by password known only to me. Quotes from the transcript will appear in the

final version of my thesis study, and may be published, and presented at academic conferences, however your identity will not be revealed at any stage. When the study is complete the code that links your name to the interview transcript will be deleted. The anonymised data will be stored in a secure location for five years. In this time it may be used for future publications. Every step will be taken to assure your confidentiality. If any disclosures of criminal activity are made during the interview they will be reported to the Gardai. This would be the only time when your confidentiality would be breached.

Data Protection

Under data protection law, it is a legal requirement to provide research participants with the following information.

1. I will be using your personal information in this research to help study older adult mental health.

2. The legal basis under which your data will be processed comes from Article 6 and Article 9 of the General Data Protection Regulation 2016.

   Article 6(1) (e) processing is necessary for the performance of a task carried out in the **public interest** or in the exercise of official authority vested in the controller;

   Article 9(2)(j) processing is necessary for archiving purposes in the public interest, scientific or historical research purposes or statistical

purposes in accordance with Article 89(1) based on Union or Member State law which shall be proportionate to the aim pursued, respect the essence of the right to data protection and provide for suitable and specific measures to safeguard the fundamental rights and the interests of the data subject.

3. The principal researcher and his two supervisors will have access to your information.

4. Your data will be stored for five years in a secure location.

5. You have a right to withdraw your consent from this study.

6. You have a right to lodge a complaint with the Data Protection Commissioner.

7. You have a right to request access to your data and obtain a copy of it, unless your request would make it impossible or make it very difficult to conduct the research. .

8. You have a right to restrict or object to processing, unless your request would make it impossible or make it very difficult to conduct the research. e.g. you don't want your data shared but don't mind having it collected and stored.

9. You have a right to have any inaccurate information about yourself corrected or deleted, unless your request would make it impossible or make it very difficult to conduct the research.

10. You have a right to have your personal data deleted, unless your request would make it impossible or make it very difficult to conduct

the research. e.g. you wanted to delete your data at the end of a research project just before it is due to be published.

11. You have a right to data portability. This means you have a right to move your data from one controller to another in a readable format.

12. There will be no automated decision making, including profiling of your personal data.

13. You have a right to object to automated processing, including profiling if you wish.

14. If I intend to further process your information, you will be informed and provided with information on the purpose of this processing.

15. I do not wish to transfer your data to a country outside of the EU or an international organization.

Where can I get further information?

If you have any further questions about the study or if you want to opt out of the study, you can rest assured it won't affect the quality of treatment you get in the future. You can get more information or answers to your questions about the study, your participation in the study, and your rights, from Mr Hugh Fulham-McQuillan who can be emailed at fulhammh@tcd.ie or telephoned at 086 356 2156. If the study team learns of important new information that might affect your desire to remain in the study, you will be informed at once.

Thank you for taking the time to read this information leaflet.

Yours sincerely,

Hugh Fulham-McQuillan

Name: Hugh Fulham-McQuillan

Address: School of Nursing and Midwifery, Trinity College Dublin, Dublin 2

Email:

Phone No:

Appendix 3: Participant Consent Forms

Participant Consent Form

Study title: Measuring and modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study.

Principal investigator: Hugh Fulham-McQuillan, a PhD student from the School of Nursing and Midwifery in Trinity College Dublin.

Aim of study

The aim of this study is to better understand the associations between alcohol consumption, from moderate to heavy misuse, and mental health in older adults. There have been many studies on this in younger adults but very few researchers have focused on adults aged 65 and/or over.

My participation

I understand I am volunteering to participate in a one to one interview, which the researcher will request to tape record. If, at any point, I feel uncomfortable with the researcher recording the interview I may ask that the recorder is switched off. If, at any time, I decide to withdraw from the study the researcher will erase the recording of our interview.

I will be asked a number of questions regarding my professional experiences with patients aged 65 and over who have received a diagnosis of depression and/or generalised and who may consume alcohol. The interview will last for 30 minutes. If I have any questions about my participation before I sign this form; the researcher will be happy to answer them.

Benefits and Risk

The results of this study may help with the diagnosis of mental disorders in older adults. It may also be beneficial to discuss these issues in a confidential setting.

As the interview will focus on my professional experience of patients with mental health and alcohol consumption, I may become uncomfortable with the questions I am asked. I understand I am not required to answer any questions that make me feel uncomfortable. If at any time I would like to stop the interview and leave, I may withdraw from the study without penalty. If I wish to contact a confidential service to speak about any mental health issues that come up during the interview, Aware is available from Monday to Sunday from 10am to 10pm, and the phone number is 1800 80 48 48. The Samaritans is available 24/7, and the phone number is 116 123. The phone number for the HSE Drugs and Alcohol Helpline is 1800 459 459, and this service available from Monday to Friday from 9.30am to 5.30pm.

Confidentiality

I understand that the interview will be tape recorded so the researcher can transcribe my answers for use in the study. My answers will not be directly linked to my name. No recordings of this interview will be played in a public forum or made available to any audience other than the researcher.

The researcher will analyse my interview answers, and the other participant's interviews, in his research, however these answers will be kept confidential. This initial analysis will be read by the researcher's supervisors. The final version of the study may include these quotes. Sections of the study will be published, and presented at conferences, in a way that does not reveal my identity. Interview notes and transcripts will be stored by the researcher in a secure location for five years.

Study title: Measuring and modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study.

*I have read and understood the **Information Leaflet** about this research project. The information has been fully explained to me and I have been able to ask questions, all of which have been answered to my satisfaction.*	***Yes ☐***	***No ☐***
I understand that I don't have to take part in this study and that I can opt out at any time. I understand that I don't have to give a reason for opting out and I understand that opting out won't affect my future medical care.	***Yes ☐***	***No ☐***
I am aware of the potential risks, benefits and alternatives of this research study.	***Yes ☐***	***No ☐***
I have been assured that information about me will be kept private and confidential.	***Yes ☐***	***No ☐***
I have been given a copy of the Information Leaflet and this completed consent form for my records.	***Yes ☐***	***No ☐***
I consent to take part in this research study having been fully	***Yes ☐***	***No ☐***

informed of the risks, benefits and alternatives.		
I give informed consent to have my data processed as part of this research study.	***Yes ☐***	***No ☐***

STORAGE AND FUTURE USE OF INFORMATION		
I give permission for material/data to be stored for possible future research related *to the current study* only if consent is obtained *at the time of the future research but only if the research is approved by a Research Ethics Committee.*	*Yes ☐*	*No ☐*
I give permission for material/data to be stored for possible future research related *to the current study* without further consent being required *but only if the research is approved by a Research Ethics Committee.*	*Yes ☐*	*No ☐*
I give permission for material/data to be stored for possible future research unrelated *to the current study* only if consent is obtained *at the time of the future research but only if the research is approved by a Research Ethics Committee.*	*Yes ☐*	*No ☐*
I give permission for material/data to be stored for possible future research unrelated *to the current study* without further consent *being required but only if the research is approved by a Research Ethics Committee.*	*Yes ☐*	*No ☐*
I understand I will not be entitled to a share of any profits	*Yes ☐*	*No ☐*

that may arise from the future use of my material/data or products derived from it.		

| |

Participant Name (Block Capitals) | Participant Signature | Date

To be completed by the Principal Investigator or nominee.

I, the undersigned, have taken the time to fully explain to the above patient the nature and purpose of this study in a way that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

| | |

---Name (Block Capitals) | Qualifications | Signature | Date

3 copies to be made: 1 for patient, 1 for PI and 1 for hospital record

Informed Consent Form

PROJECT TITLE: Measuring and Modelling the association between the mental health of community dwelling older adults and levels of alcohol use: a mixed methods study.

PRINCIPAL INVESTIGATOR: Hugh Fulham-McQuillan, a PhD student from the School of Nursing and Midwifery in Trinity College Dublin.

BACKGROUND

Aim of study

The aim of this study is to better understand the associations between alcohol consumption, from moderate to heavy misuse, and mental health in older adults. There have been many studies conducted on these links in younger adults but very few researchers have focused on adults aged 65 and/or over.

My participation

I understand I am volunteering to participate in a one to one interview, which the researcher will request to record (audio), in a place and time of my choosing. If, at any point, I feel uncomfortable with the researcher recording the interview I may ask that the recorder is switched off. If, at any time, I decide to withdraw from the study the researcher will erase the recording of our interview.

I will be asked a number of questions regarding my professional experiences with patients aged 65 and over who have received a diagnosis of depression and or generalised and who may consume alcohol. The interview will last up to 40 minutes. If I have any questions about my participation before I sign this form; the researcher will be happy to answer them.

Benefits and Risk

The results of this study may contribute to the diagnosis of mental disorders associated with alcohol use in older adults. As the interview will focus on mental health and alcohol consumption, I may become uncomfortable with the questions am asked. I understand I am not required to answer any questions that make me feel uncomfortable. If at any time I would like to stop the interview and leave, I may withdraw from the study without penalty. If I wish to contact a confidential service to speak about any mental health issues that arise during the interview, Aware is available from Monday to Sunday from 10am to 10pm, and the phone number is 1800 80 48 48. The Samaritans is available 24/7, and the phone number is 116 123. The phone number for the HSE Drugs and Alcohol Helpline is 1800 459 459, and this service available from Monday to Friday from 9.30am to 5.30pm.

Confidentiality

I understand that the interview will be tape recorded so the researcher can transcribe my answers for use in the study. My answers will not be directly linked to my name. No recordings of this interview will be played in a public forum or made available to any audience other than the researcher.

The researcher will analyse my interview answers, and the other participant's interviews, in his research, however these answers will not be linked to any participant's name or any other identifying information. This initial analysis will be read by the researcher's supervisors. The final version of the study may include these quotes. Sections of the study will be published,

and presented at conferences, in a way that does not reveal my identity. Interview notes and transcripts will be stored by the researcher in a secure location for five years as recommended by the Trinity Faculty of Health Sciences Research Ethics Committee.

DECLARATION:

I have read, or had read to me, the information leaflet for this project and I understand the contents. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand that I may withdraw from the study at any time and I have received a copy of this agreement.

PARTICIPANT'S

NAME:……..

CONTACT DETAILS:……..

PARTICIPANT'S

SIGNATURE:……..

Date:……..

Where the participant is incapable of comprehending the nature, significance and scope of the consent required or is under 18 years old, the form must be signed by a person legally competent to give consent.

NAME OF CONSENTER, PARENT or

GUARDIAN:……...

SIGNATURE:……

……...

RELATION TO

PARTICIPANT:……

……...

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

INVESTIGATOR'S SIGNATURE:……

Date:……

(Keep the original of this form in the investigator's file, give one copy to the participant, and send one copy to the sponsor (if there is a sponsor).

Appendix 4: Interview Guide

How do you usually recognise depression in older adults?

1. What difficulties have you found in diagnosing depression in this population?

   Probe: What other issues do you come across in diagnosing depression in older adults?

2. How long would your average appointment last?
3.

   Probe: What effect do you feel this has on your ability to diagnose mental health problems in older adults?

4. The research on older adult depression suggests that somatic symptoms are more prevalent in this population than in younger age groups. How does this hold up in your professional experience?

   Probe: If yes, why do you think older adults are more likely to present with somatic symptoms?

   Probe: If yes, would you say that their presentation with somatic symptoms can result in less adults receiving a diagnosis?

5. What other medical problems do you tend to see in older patients with depression?

   Probe: physical health problems, other mental health problems, anxiety

   Probe: how do these affect the patient's likelihood of receiving a diagnosis? (Immobility, getting out of the house)

6. How severe does an older adult's depression have to be to warrant a diagnosis, and treatment?

7. Do you distinguish between depression and anxiety in this population, and if so, how?

Depression and Alcohol consumption

8. How would you describe the drinking patterns of your older adult patients in general?

   Probe: if no, how would you describe their drinking habits?

   Probe: Would many of these older adults drink over the recommended guidelines?
   Probe: How many of these would have depression or anxiety?

9. How would you describe the characteristics of patients who have depression and who misuse alcohol?

10. Where do older adults with depression do most of their drinking?

    Probe: Would they drink alone? Socially?

    Probe: How often would these older adults drink?

11. How would you describe the alcohol consumption of patients who have anxiety?

    Probe: How does this differ to those who have depression?

12. Do you advise patients to reduce their consumption when you suspect they have depression or are at risk of depression?

    Probe: If yes, how do they respond to your advice?
    Probe: How does this reduction affect their depressive symptoms?

13. How large a role does the question of alcohol consumption play in your treatment of patients with depression?

14. One of the perennial questions in the research literature is which precedes the other, depression or alcohol misuse. From your experience, which tends to develop first?

15. What other trends have you noticed among your patients regarding alcohol and depression?

16. How would you rate the physical health of those who misuse alcohol and who have depression?

17. How would you say those patients (with depression and who misuse alcohol) rate their physical health?

18. What role does loneliness play in older adult depression?

19. What steps could GPs/Psychiatrists take to better diagnose depression in the older adult population?

Appendix 5: Logistic regression for threshold depression

Table 30.
Logistic regression analysis for variables predicting Threshold depression

Variable	B	S.E.	Sig.	Odds ratio	95% C.I.
Age group					
75+	-.17	.31	.58	.84	(.46-1.54)
Gender					
Female	.29	.30	.34	1.34	(.73-2.45)
Education					
None/Primary			.33		
Secondary	-.29	.34	.38	.74	(.37-1.45)
Tertiary	.21	.39	.57	1.24	(.57-2.67)
Self-rated health					
Good			.026		
Very good	.64	.38	.09	1.90	(.89-4.06)
Poor to fair	.97	.35	.006	2.66	(1.31-5.38)
Excellent	1.12	.58	.056	3.08	(.97-9.77)
Marriage status					
Married	-.00	.36	.99	.99	(.49-2.02)
Long-term illness					
None			.034		
One long-term illness	.96	.37	.011	2.63	(1.25-5.52)
Limiting long-term illness	.55	.36	.12	1.73	(.85-3.51)
Socio-economic class					
Non-manual			.32		
Manual work	.31	.31	.31	1.37	(.73-2.57)
Never worked	-.59	.73	.41	.55	(.13-2.31)
CASP-19 Quality of Life Scale	-.04	.02	.032	.95	(.91-.99)
Extraversion NEO-PI	-.07	.02	.010	.92	(.87-.98)
Neuroticism NEO-PI	.15	.02	.000	1.16	(1.10-.123)
Conscientiousness NEO-PI	.04	.02	.07	1.05	(.99-1.10)
Social connectedness					
Moderately integrated			.87		
Most integrated	.06	.39	.87	1.06	(.49-2.30)
Moderately isolated	.28	.34	.41	1.32	(.67-2.60)
Most isolated	.27	.52	.60	1.31	(.46-3.70)

Table 30. (continued)

UCLA loneliness scale	.12	.06	.08	1.12	(.98-1.29)
Penn Worry Scale					
	.72	.31	.021	2.06	(1.11-3.82)
Smoking status					
Current smoker	.01	.40	.97	1.01	(.45-2.23)
Mini Mental Scale					
Increased odds of dementia	.60	.68	.37	1.82	(.47-6.99)
Disability status					
Disabled	-.46	.39	.24	.63	(.28-1.37)
Prescribed antidepressant					
Yes	.33	.62	.58	1.39	(.41-4.71)
Chronic health conditions					
No condition			.51		
One condition	-.40	.41	.32	.66	(.29-1.49)
More than one condition	-.41	.39	.29	.66	(.30-1.43)
No. functional limitations	.23	.07	.001	1.26	(1.09-1.44)
Self-rated vision					
Excellent			.42		
Very good	.01	.37	.98	1.01	(.48-2.11)
Good	-.54	.44	.22	.58	(.24-1.38)
Blind to Fair	-.18	.53	.73	.83	(.29-2.38)
Alcohol consumption					
Abstinent			.33		
Moderate drinking	.14	.32	.65	1.15	(.61-2.16)
At-risk drinking	.05	.44	.91	1.05	(.43-2.52)
Harmful drinking	1.01	.57	.07	2.77	(.89-8.55)
Self-rated hearing					
Good			.60		
Very good	.36	.36	.32	1.43	(.70-2.94)
Poor to Fair	.41	.33	.21	1.51	(.78-2.92)
Excellent	.18	.48	.70	1.19	(.46-3.08)

Appendix 6: Conference presentations

Fulham-McQuillan, H., McKee, G., & Doyle, L. (2018) On the association between depression and alcohol consumption in older adults living in Ireland. Trinity Health and Education Conference.

Fulham-McQuillan, H. (2014) Measuring and modelling the longitudinal relationship between the mental health of community dwelling older adults, and alcohol and tobacco use. Annual Psychology, Health & Medicine Conference