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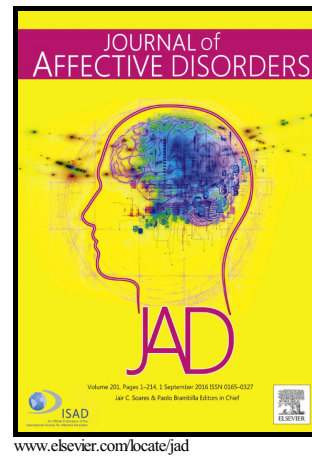
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The Prevalence, Reporting, and Treatment of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities

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ABSTRACT

Background:

Little is known about anxiety in aged care populations, despite its increase in this frail population. This study investigated the prevalence, recording, and treatment rate of anxiety disorders among aged care residents.

Methods:

A cross-sectional, observational design was used to assess 180 elderly residents from 12 aged care facilities in Melbourne, Australia. Participants were assessed for threshold and subthreshold anxiety disorders and comorbid depression using the MINI for DSM-5. Medical files were also reviewed to determine whether there was any indication that anxiety had previously been detected, and what treatment those with a threshold/subthreshold diagnosis were receiving.

Results:

Overall prevalence of threshold and subthreshold anxiety disorders was 19.4% and 11.7%, respectively. Generalized anxiety disorder was the most common threshold disorder and agoraphobia was the most prevalent subthreshold anxiety disorder. While less than half of those with a threshold or subthreshold anxiety disorder had an indication of anxiety in their file, the majority received psychotropic medication. Cognitive impairment was not significantly associated with the prevalence or treatment of anxiety.

Conclusions:

The prevalence of threshold and subthreshold anxiety in aged care settings is high, but remains under-reported by staff and GPs. Facility staff and GPs should ensure they are aware of how anxiety presents in elderly residents and routinely screen for this common mental health issue. This cohort had poor access to psychological treatments for their condition.

Key words: Anxiety, prevalence, elderly, nursing home, aged care, treatment

INTRODUCTION

Anxiety disorders are the most common mental health issue in older adults (≥ 65 years) (Gonçalves, Pachana, & Byrne, 2011; Gum, King-Kallimanis, & Kohn, 2009). Despite this, there is limited research into their prevalence in residential aged care facilities (RACFs; also known as nursing homes, hostels, assisted living facilities, or long-term care/residential homes), with a review by Creighton, Davison, and Kissane (2015) finding only 10 studies addressing this important topic. These available studies indicated that anxiety disorders are more prevalent in RACFs than in the community; with reports ranging from 3.2% to 20.0% in aged care populations compared to 1.4% to 17.0% among older adults living in their own homes (Creighton et al., 2015).

However, considerable inconsistency exists across studies in reported prevalence rates for overall and specific anxiety disorders within RACFs, making it difficult to draw firm conclusions. For instance, Junginger, Phelan, Cherry, and Levy (1993) reported the overall prevalence of anxiety disorders according to the Diagnostic and Statistical Manual of Mental Disorders Third Edition, Revised (DSM-III-R; American Psychiatric Association [APA], 1987) to be 20.0% and found generalized anxiety disorder (GAD) to be the most prevalent specific disorder (6.0%). In contrast, Cheek, Snowdon, Miller, and Vaughan (1996) reported an overall prevalence of 3.7% and found specific phobia to be the most common (14.0%). Previous studies utilized now outdated diagnostic systems and further research utilizing contemporary diagnostic criteria (i.e., the fifth edition of the DSM (APA, 2013) on the current cohort of older adults is urgently needed. Moreover, many previous studies either excluded specific conditions from their overall estimate (e.g., Cheek, Snowdon, Miller, & Vaughan, 1996) or did not report the prevalence of specific disorders (e.g., Arvaniti et al., 2005; Forsell & Winblad, 1997; Jervis & Manson, 2007; Parmelee, Katz, & Lawton, 1993). Similarly, most studies did not examine the relationship between anxiety and depression, despite it being found to frequently co-occur in elderly community samples (Braam et al., 2014; Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010). Thus, research clarifying the prevalence of specific and overall anxiety disorders as well as the relationship between anxiety and depression in RACFs is required to address this gap in current literature.

Also problematic is the lack of available studies investigating the prevalence of subthreshold anxiety (i.e., anxiety not meeting full diagnostic criteria). The only published study within an aged care setting located by the authors reported a lower prevalence of subthreshold anxiety disorders than DSM-4 (APA, 1994) threshold disorders (4.2% vs. 5.7%; Smalbrugge, Pot, Jongenelis, Beekman, & Eefsting, 2005). This is in contrast to higher rates of subthreshold than threshold anxiety reported in community settings (Grenier et al., 2012; Heun, Papassotiropoulos, & Ptok, 2000) and requires replication, given the substantial negative impact of subthreshold disorders on functioning and quality of life (van Zelst, De Beurs, Beekman, van Dyck, & Deeg, 2006).

Given the paucity of research into prevalence rates within RACFs, it is not surprising that little is known about the recording and treatment of anxiety in this setting. Drageset, Eide, and Ranhoff (2013) found only half of the cognitively-intact RACF residents who reported anxiety symptoms had a diagnosis on file, and less than half of those with a file diagnosis were treated with an anxiolytic. Prior studies into the treatment of anxiety in RACF residents have focused on the use of pharmacological interventions only, with the most commonly used medications being anti-depressants (48%) and anxiolytics (38% - 97%) (Bourgeois et al., 2012; Selbæk, Kirkevold, & Engedal, 2007), with no attention paid to documentation of psychological treatments. Given that late-life anxiety can be effectively treated using psychological as well as pharmacological treatments, particularly if detected and treated early (Barlow & Comer, 2013), this gap requires redress. Moreover, with previous research on depression in RACFs finding cognitive impairment impedes detection (Evers et al., 2002) and is associated with slightly lower treatment rates (Davison et al.,

2007), an understanding of its impact on the recognition and treatment of anxiety is vital, particularly given that over half of aged care residents have been found to have some level of cognitive impairment (Onder et al., 2012; Selbæk et al., 2007).

To address the abovementioned gaps and limitations, this study aimed to investigate the prevalence of DSM-5 (APA, 2013) threshold/subthreshold anxiety disorders and comorbid depression in a sample of elderly RACF residents with mild cognitive impairment and normal cognitive function. The study also explored the treatment and reporting rates of anxiety by GPs and RACF staff. Not only will this information offer researchers and clinicians with a better understanding of the current cohort of older adults living in aged care, it will also provide better insights into the effectiveness of current aged care practices in detecting and managing this treatable condition.

METHODS

Study design

This study utilised an observational, cross-sectional design. Ethics approval was granted by the Monash University Human Research Ethics Committee.

Participants

Utilizing a formula by Daniel (1999) and recommended by Naing, Winn, and Rusli (2006), a sample size of 171 participants was determined adequate to estimate population prevalence with 95% confidence. Residents were excluded if they: were <65 years old; resided at the RACF for less than three months; scored <18 on the Mini-Mental State Examination (MMSE); had a diagnosis of schizophrenia or bipolar affective disorder; or were unable to complete clinical assessments because of illness, medication, sensory or speech impairment, intellectual disability, or lack of language fluency.

One-hundred and eighty participants were recruited between March 2015 and November 2016 at a randomly selected group of 12 RACFs within southern and eastern regions of metropolitan Melbourne. Figure 1 provides an overview of participant recruitment with reasons for exclusion or refusal indicated.

Measurements

Demographic and medical information: Information on participants' age, marital status, date of RACF admission, and current prescribed medications (regular and PRN) were derived from their files held at the facility. Lists of medical diagnoses and behaviour charts kept in each participant's file were also reviewed to determine whether there was any indication of anxiety recorded by facility staff, GPs, or other medical practitioners.

Depression and anxiety: The presence of current major depressive disorder (MDD) and threshold and subthreshold anxiety disorders (panic disorder, social anxiety disorder (SAD), agoraphobia, specific phobia, and generalized anxiety disorder) was determined using the Mini-International Neuropsychiatric Interview version 7.0.0 (MINI; Sheehan et al., 1998). The MINI is a structured clinical interview that generates diagnoses according to DSM-5 (APA, 2013) criteria, and has been widely used in research and clinical settings. While not specifically developed for older adults, this diagnostic measure has been previously used within RACF settings (e.g., Arvaniti et al., 2005; Pachana et al., 2007). Two trained interviewers administered the MINI, with the inter-rater reliability (as measured by Cohen's kappa for a subset of 22 participants) being: 1.0 for panic

disorder and agoraphobia, and 0.65 for GAD. Inter-rater reliability for MDD, SAD, and specific phobia could not be computed as no participants in the subsample met criteria for a diagnosis. Training on the use of this measure and continuous supervision was provided throughout the study.

Subthreshold anxiety disorders were defined using criteria developed by Angst, Merikangas, and Preisig (1997) and Heun et al. (2000) (Table 1), and extrapolated using information derived from the MINI interview responses. These criteria have also been used in previous research examining anxiety in an aged care population (e.g., Smalbrugge, Pot, et al., 2005). Similar to Heun et al. (2000), subthreshold disorders could be diagnosed in participants with other threshold or subthreshold anxiety disorders, but were only diagnosed if the related threshold diagnosis was absent (i.e., subthreshold GAD was only diagnosed in participants who did not meet criteria for threshold GAD).

Cognitive functioning: Cognitive functioning was assessed using the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975); a commonly used, brief cognitive screening instrument comprising 11-items assessing orientation, memory recall, attention, language, comprehension, and visuospatial skills. The MMSE provides an overall score out of 30, with commonly accepted cut-off points being: 24-30 for normal cognition; 18-23 for mild cognitive impairment; and 0-17 for moderate to severe cognitive impairment (Tombaugh & McIntyre, 1992).

Procedure

Using a random number generator, 19 RACFs were randomly selected from a list of all facilities within southern and eastern metropolitan Melbourne, and invited to participate via phone call and email. Twelve facilities agreed to participate and included private companies, non-for-profit and religious organizations, and government funded facilities. Screening and identification of potential participants was completed with the assistance of the manager and/or director of nursing of each participating facility. Eligible residents were then approached by the first author (AC) and completed a process developed by Warner, McCarney, Griffin, Hill, and Fisher (2008) to determine their capacity to provide informed consent. If deemed able to provide informed consent, they were invited to participate in the study and sign the consent form. For those considered unable to provide consent themselves, the 'person responsible' was approached to provide written informed consent. The MMSE was then administered, with residents scoring <18 excluded from the study, as well as residents who met other exclusion criteria. All participants were administered the MINI to determine the presence/absence of MDD and threshold/subthreshold anxiety disorders.

Statistical Analysis

Data was collated and analyzed using the Statistical Package for Social Sciences (SPSS) version 22. Percentages were calculated to estimate the prevalence of MDD, threshold/subthreshold anxiety disorders, and comorbid MDD and anxiety. As recommended by Brase and Brase (2017), 95% confidence intervals (CI) were calculated using the normal approximation method in the first instance, and Wilson estimate if $np \leq 10$ or $n(1-p) \leq 10$. As one participant did not complete the SAD and Specific Phobia subsections of the MINI, the total sample size for these disorders was 179.

For the reporting and treatment of anxiety, percentages were calculated to determine how many of those who met criteria for a threshold/subthreshold anxiety disorder had an indication of anxiety on file and were receiving medication or psychological treatment. As MMSE scores for participants with no threshold/subthreshold anxiety disorders were found to have significant kurtosis (z-score of >1.96) (Field, 2009), non-parametric Mann-Whitney *U* tests were used to determine whether there was a difference in level of cognitive functioning between those diagnosed

with a threshold/subthreshold anxiety disorder and those receiving treatment. An alpha of 0.05 was used for all statistical tests.

RESULTS

Study Population

Demographic and clinical characteristics of the sample are shown in Table 2. The sample comprised 60 males (33.3%) and 120 (66.7%) females, with a mean age of 85.4 years (SD = 7.4). The age distribution and gender ratio of the sample was typical of residents of RACFs in Australia (Australian Institute of Health and Welfare, 2015).

Prevalence of Threshold and Subthreshold Anxiety Disorders

Threshold anxiety disorders: Using the MINI for DSM-5, the overall prevalence rate of any current threshold anxiety disorder was 19.4% (95% CI: 13.6 – 25.2%); with 35 participants meeting criteria for one or more disorders (Table 3). Most participants met criteria for one threshold disorder ($n = 29$, 82.9%), five participants (14.3%) met criteria for two, and one participant met criteria for three (panic disorder, agoraphobia, and GAD; 2.9%). GAD was the most prevalent threshold disorder, followed by specific phobia. There was no significant difference in level of cognitive functioning between participants with a threshold anxiety disorder (Mdn = 26.00, Range = 11, $n = 35$) and those without (Mdn = 25.00, Range = 12, $n = 145$), $z = 0.114$, $p = 0.909$.

Subthreshold anxiety disorders: Overall prevalence of any current subthreshold anxiety disorder was 11.7% (95% CI: 7.0 – 16.4%); with 21 participants meeting criteria for one or more disorders. In eight cases the subthreshold disorder co-occurred with one or more threshold anxiety disorders, while the remaining participants met criteria for one subthreshold disorder only. No significant differences were found in level of cognitive functioning between participants with a subthreshold anxiety disorder (Mdn = 26.00, Range = 11, $n = 21$) and those without (Mdn = 25.00, Range = 12, $n = 159$), $z = 0.678$, $p = 0.498$.

Prevalence of MDD and comorbid anxiety and MDD

Fifteen participants met criteria for MDD (8.3%; 95% CI: 4.8 – 12.3%), with the prevalence of comorbid MDD and any threshold anxiety disorder found to be 6.7% (95% CI: 3 – 10.4%). Of those with threshold anxiety, 34.3% also received a diagnosis of MDD, with panic disorder the diagnosis with the highest rate of comorbid MDD (100%). Fifty percent of participants with agoraphobia, 43.8% of those with GAD, and 22.2% of those with specific phobia also had a diagnosis of MDD. Only four participants (2.2%) in the total sample had comorbid subthreshold anxiety and MDD.

Reporting and treatment of anxiety

Reporting of any threshold/subthreshold anxiety disorder: Less than half of participants with a threshold or subthreshold anxiety disorder had any indication of anxiety on file (i.e., the terms 'anxiety', 'anxiety disorder', 'anxious' were included in the list of medical conditions or on behavioural charts) (Table 4).

Treatment of any threshold/subthreshold anxiety disorder: Of the 56 participants with a threshold or subthreshold anxiety disorder, more than half were receiving a treatment that was potentially prescribed for anxiety (see Table 4). Similar treatment rates were found for threshold and

subthreshold conditions. Psychological treatment had been provided to 8.6% of participants with a threshold anxiety disorder but to no participants with a subthreshold diagnosis.

Mann-Whitney tests revealed no significant differences in cognitive function between participants who were and were not receiving anti-depressants within the overall sample ($p = 0.311$), and for those with a threshold ($p = 0.123$) or subthreshold disorder ($p = 1.000$). Similarly, no significant differences in cognition were found between those who were and were not receiving benzodiazepines (overall sample: $p = 0.895$; those with a threshold anxiety disorder: $p = 0.606$; those with a subthreshold anxiety disorder: $p = 0.310$) or antipsychotics (overall sample: $p = 0.427$; those with a threshold anxiety disorder: $p = 0.612$; those with a subthreshold anxiety disorder: $p = 0.857$).

Reporting of anxiety in participants with a specific threshold/subthreshold anxiety disorder: All participants with threshold panic disorder and agoraphobia had an indication of anxiety on file, as did the majority of participants with threshold SAD (Table 5). Less than half with threshold GAD and only 18.2% with threshold specific phobia had any record of anxiety. Participants with subthreshold GAD and specific phobia had the highest rates of anxiety recorded in their file. Half the participants with subthreshold SAD and none with subthreshold agoraphobia had an indication of anxiety noted.

Treatment of anxiety in participants with a specific threshold/subthreshold anxiety disorder: As shown in Table 5, the most common treatment for participants with specific threshold anxiety disorders were benzodiazepines; with 100% of participants with panic disorder and SAD, 80.0% of those with agoraphobia, and 65.0% of those with GAD prescribed this medication. Anti-depressants were also commonly prescribed. Antipsychotics were uncommonly prescribed. Participants with threshold specific phobia were the least likely to have received treatment.

At least half of the participants with a threshold anxiety disorder received a combination of anti-depressants and benzodiazepines; with this being the case for threshold SAD, agoraphobia, and GAD. Participants with threshold panic disorder or specific phobia were typically prescribed a benzodiazepine only. Participants with a subthreshold anxiety disorder who were receiving treatment were also typically prescribed a combination of anti-depressants and benzodiazepines.

DISCUSSION

To the authors' knowledge, this study is the first in 10 years to examine the prevalence of anxiety disorders and comorbid MDD in RACFs, and only the second published study to determine the reporting and treatment rates of anxiety by GPs, other medical practitioners, and facility staff.

The prevalence of overall and specific threshold/subthreshold anxiety disorders

Overall, 26.7% of the sample met criteria for a threshold or subthreshold anxiety disorder. There was a high overall prevalence of threshold anxiety disorders, with 19.4% meeting DSM-5 (APA, 2013) criteria. This falls into the upper range of prevalence estimates reported by previous RACF studies; where rates were between 3.2–20.0% (Arvaniti et al., 2005; Forsell & Winblad, 1997; Junginger, Phelan, Cherry, & Levy, 1993; Smalbrugge, Pot, et al., 2005). Compared to population-based studies (where prevalence estimates range between 1.4% to 17.0% (Creighton et al., 2015)), the current study provides further evidence that older adults living in residential care are more prone to experience anxiety, indicating that the condition remains a widespread and significant issue within this setting.

In agreement with previous late-life research (Bryant, Jackson, & Ames, 2008; Krasucki, Howard, & Mann, 1999), threshold GAD (11.1%) and specific phobia (6.1%) were the two most common anxiety disorders. Again, rates of both disorders in the current RACF sample were in the upper range or higher than previous Bland, Newman, & Orn, 1988; Cheok et al., 1996; Class et al., 1996; Junginger et al., 1993; Smalbrugge, Pot, et al., 2005). The prevalence of GAD was also higher than that found in community-dwelling elderly samples (Beekman et al., 1998; Byers et al., 2010). As chronic physical illnesses and functional limitations have been found to be significantly associated with GAD (Beekman et al., 1998; Van Balkom et al., 2000), the higher rate of this disorder within the current aged care sample may be explained by the fact that this population is typically more frail, functionally dependent, and medically complex than their community-dwelling counterparts (Australian Institute of Health and Welfare, 2015).

Agoraphobia (2.7%), SAD (1.7%), and panic disorder (1.7%) were found to be relatively uncommon, which is consistent with the limited previous research in RACFs (Cheok et al., 1996; Jervis & Manson, 2007; Smalbrugge, Pot, et al., 2005). Similar estimates have been found within community elderly samples (e.g., Beekman et al., 1998; Kirmiziloglu, Doğan, Kuğu, & Akyüz, 2009). Given that older adults (particularly RACF residents) often have fewer obligations and are typically more restricted in their daily activities (De Bellis, 2010), it may be that they find it easier to avoid activities and situations that evoke the fear and anxiety associated with these disorders.

Unlike previous studies on community elderly samples (Grenier et al., 2011; Heun et al., 2000), the current study found subthreshold anxiety disorders to be *less* prevalent (11.7%) than threshold disorders. Nonetheless, a substantial proportion of the sample met criteria for subthreshold anxiety disorders, with agoraphobia (3.9%), GAD (3.3%), and SAD (3.3%) being the most common.

The prevalence rates found in the current sample appear to be higher than those in prior research. It should be noted that most previous RACF studies utilised hierarchical rules or did not include all anxiety disorders in their overall prevalence (e.g., Bland et al., 1988; Cheok et al., 1996), and therefore may have underestimated the true prevalence of anxiety. Moreover, as previous studies on anxiety in RACFs were conducted over 10 years ago, it is possible that the higher prevalence estimations found in the current study are due to cohort or cultural differences regarding the acceptability of disclosing symptoms. Thus, it may be that this study's findings are a more accurate reflection of the true prevalence of anxiety within the current RACF population.

Another explanation for higher estimations could be the current study's use of DSM-5 (APA, 2013) and the MINI. Several important changes were made to anxiety disorder criteria in DSM-5; with a broadening of feared consequences in SAD and removal of the requirement for individuals to recognize their anxiety is excessive or unreasonable for a diagnosis of SAD, agoraphobia, and specific phobia (APA, 2013). As older adults with anxiety often have poor insight into their symptoms and frequently misattribute them to medical etiology (Lenze & Wetherell, 2011), a number may not have met criteria using previous versions of the DSM. Moreover, the MINI was designed to be slightly overinclusive to decrease the chances of false negatives (Sheehan et al., 1997; Sheehan et al., 1998) and so may have contributed to higher prevalence rates.

Threshold/subthreshold anxiety disorders and cognitive impairment

Previous research reported mixed findings on the relationship between cognitive impairment and anxiety (Cheok et al., 1996; Smalbrugge, Pot, et al., 2005). In this study, mild cognitive impairment was not found to be significantly associated with the presence of threshold or

subthreshold anxiety disorders, which is consistent with research by Cheok et al. (1996) and Neville and Teri (2011). Some research has found higher levels of cognitive functioning to be significantly associated with anxiety (Smalbrugge, Pot, et al., 2005) while others have reported higher rates of anxiety among those with lower cognitive functioning (Parmelee et al., 1993; Zuidema, De Jonghe, Verhey, & Koopmans, 2009). Given that more than half of the RACF population has dementia (AIHW, 2015), further research is needed to clarify the precise relationship between anxiety and cognitive functioning among RACF residents

Comorbid anxiety and MDD

Overall, comorbid threshold anxiety and MDD was found in 6.7% of the sample. Thirty-four percent of participants with a threshold anxiety disorder and 19.0% with subthreshold anxiety had comorbid MDD, which is consistent with previous research in both RACF (Parmelee et al., 1993; Smalbrugge, Jongenelis, Pot, Beekman, and Eefsting (2005)) and community samples (Beekman et al., 1998; Schoevers, Beekman, Deeg, Jonker, & Van Tilburg, 2003). Given that anxiety typically precedes depression (Wetherell, Gatz, & Pedersen, 2001), the high rates of comorbidity in residents with anxiety is not surprising and suggests the lower comorbidity rate found with subthreshold anxiety disorders may be because the anxiety and its consequences are not yet severe enough to evoke depressive symptoms. Further RACF research (particularly longitudinal studies) is needed to clarify the prevalence of comorbid threshold/subthreshold anxiety and depression in this population and determine the direction of their relationship.

Recording and treatment of anxiety

Less than half the participants with a threshold or subthreshold anxiety disorder had any indication of anxiety on file, suggesting that the condition is significantly under-reported. This is in contrast to treatment rates, with the majority found to have been prescribed an anti-depressant and/or benzodiazepine. For the majority of participants the authors were unable to identify whether their medications were used to treat anxiety or some other condition (e.g., depression, agitation). However, given the significant under-reporting of anxiety in this study, it may be that the medication was not primarily prescribed to treat participants' anxiety in some instances. Therefore, this study may have overestimated the true treatment rate of anxiety.

Another explanation for the under-reporting of anxiety in the context of high prescription rates may be that GPs are prescribing medications for anxiety symptoms, but failing to record their detection in residents' files. This may be because GPs perceive anxiety to be a normal part of ageing and/or response to residing in RACFs, and subsequently believe no formal diagnosis or record on file is needed. Previous studies examining the treatment and detection of depression in RACFs have reported similar findings (Cohen, Hyland, & Kimhy, 2003; Gruber-Baldini et al., 2005; Lustenberger, Schüpbach, Von Gunten, and Mosimann, 2011), suggesting that under-diagnosis and reporting of psychiatric conditions in aged care residents is common. This suggests a valid screening measure and specialised training in the recognition of anxiety for RACF nursing staff may be beneficial.

This study confirms previous findings that psychotropic medication and polypharmacy is typically used as first line treatment for mental health concerns in RACF residents (Davison et al., 2007; Davison et al., 2012), despite the potential adverse side-effects observed in frail older adults (Hajjar, Cafiero, & Hanlon, 2007). Reasons for overdependence on pharmacological approaches may include a perceived negative social stigma associated with seeking psychological support, lack of staff awareness of mental health, inadequate funding, and poor access to psychological care

providers (Davison et al., 2016). However, with growing evidence for the effectiveness of psychological intervention in treating anxiety and depression in elderly residents (Wells et al., 2014), RACF staff and GPs should be educated on the potential benefits of psychotherapy for this population.

Agoraphobia and panic disorder were the most commonly detected and treated specific threshold anxiety disorders. One reason for this may be that the symptoms associated with these disorders are overt and behaviourally-based (i.e., panic attacks, avoidance of specific situations), meaning that staff are more likely to notice them and their impact on functioning. Panic disorder appeared to be most commonly treated with benzodiazepines (100.0%), which is consistent with previous research (Van Balkom et al., 2000). Threshold specific phobia appeared to be the least commonly detected and treated disorder, possible due to the limited impact of symptoms on residents' daily life.

Although participants with normal cognition appeared to have slightly higher treatment rates, no significant difference was found in the treatment of anxiety between residents with normal cognitive function and mild impairment. This finding is similar to a previous study examining treatment rates of depression in RACFs (Davison et al., 2007), however the current study experienced the same methodological limitations of a small sample size and exclusion of residents with higher levels of cognitive impairment. Further studies with a larger sample size that includes residents with moderate/severe cognitive deficits are needed.

Study limitations

There are a number of limitations to this study. First, a cross-sectional design was used, which limits the interpretation of findings as causal inferences cannot be made between anxiety and cognition. Second, given that participation was voluntary and those with significant cognitive impairment were excluded, the sample may suffer from selection bias and limit generalizability of findings. Third, while the sample size was likely adequate to detect prevalence of overall anxiety, the final sample was a small proportion of the total population available. Moreover, the small cell sizes and large confidence intervals for specific anxiety disorders means findings for prevalence, reporting, and treatment must be interpreted with caution. Lastly, the current study did not assess for separation anxiety disorder, selective mutism, substance/medication-induced anxiety disorder, or anxiety disorder due to another medical condition. As well as being mindful not to overburden participants with questions, separation anxiety and selective mutism were not considered vital given they seldom persist into adulthood (Garcia, Freeman, Francis, Miller, & Leonard, 2004; Shear, Jin, Ruscio, Walters, & Kessler, 2006), while substance/medication-induced anxiety disorder or anxiety disorder due to another medical condition were not assessed by the MINI for DSM-5. The exclusion of these disorders may have resulted in an underestimation of the prevalence of anxiety disorders within this setting.

Conclusions

Although, due to variable prevalence estimates across studies the true prevalence of specific anxiety disorders among RACF residents remains uncertain, this study confirms the high rate of anxiety among this frail and growing population. Despite this, anxiety appears to remain largely under-reported and undertreated with psychological therapies. From a clinical perspective, this highlights the need for an increase in overall awareness of anxiety and the range of effective treatment options among GPs and RACF staff and suggests the identification and use of a valid screening measure may aid in detection and therefore improved outcomes for residents. Thus, as

well as examining the prevalence of threshold/subthreshold anxiety in aged care through the use of a prospective design and inclusion of residents with more severe cognitive impairment, research identifying a reliable, valid, and easy to use screening measure for anxiety among RACF residents would be beneficial.

Contributors

This paper is part of AC's doctoral research. With the assistance of TD and DK, AC designed the study and wrote the protocol, undertook the statistical analysis and interpretation and wrote the first draft of the manuscript. TD and DK read and provided comments and suggestions for all further drafts. All authors have contributed to and approved the final manuscript.

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None.

Conflict of Interest

No authors of this paper have any conflicts of interest.

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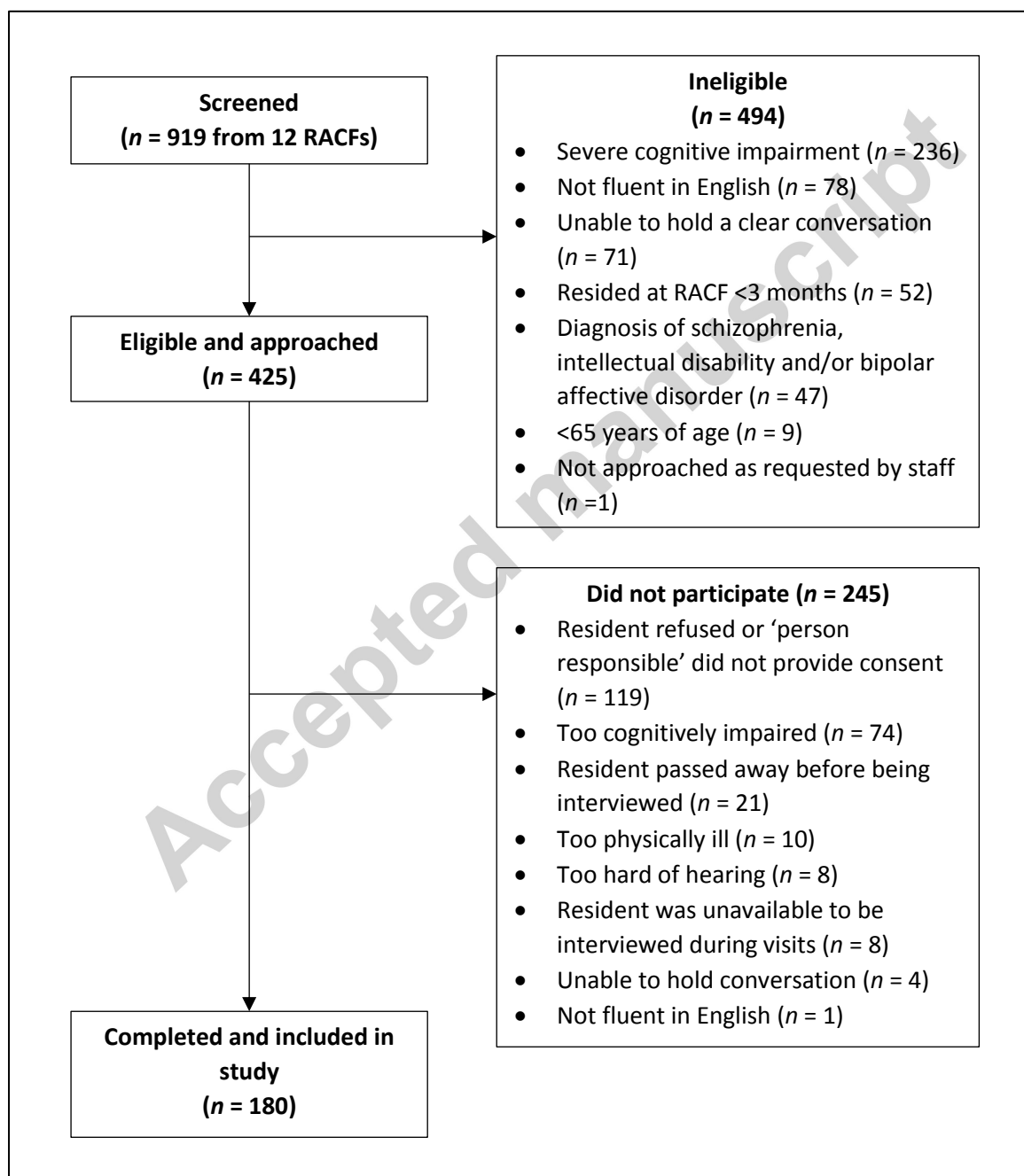


Figure 1. Participant recruitment flowchart.

Table 1 Criteria for Subthreshold Anxiety Disorders (According to Criteria of Angst et al. (1997) and Heun et al. (2000))

Anxiety disorder	Subthreshold criteria
Panic disorder	A subthreshold panic attack (a panic attack with one or more physical symptoms) during the last 4 weeks.
Agoraphobia	Unreasonable fear in places or situations from which it is difficult to leave during the last 4 weeks and at least some avoidance or symptoms of anxiety.
Specific phobia	Persistent fear of circumscribed stimulus during the last 4 weeks and at least some avoidance or consequences.
Social anxiety disorder	Persistent fear of situations in which a person is exposed to social interactions during the last 4 weeks and at least some avoidance or consequences.
GAD	Unrealistic anxiety or worry about two or more life situations during the last 6 months and at least one physical or vegetative symptom, and person finds it distressing.

GAD, Generalized Anxiety Disorder.

Table 2 Demographic and Clinical Characteristics of the Sample ($N = 180$)

Characteristic	<i>N</i>	%	Mean	<i>SD</i>	Range
Age (years)			85.4	7.4	66-101
Sex					
Male	60	33.3			
Female	120	66.7			
Marital Status					
Never married/single	12	6.7			
Married	34	18.9			
Divorced/separated	36	20.0			
Widowed	96	53.3			
Other	2	1.1			
Years of education			10.8	3.3	1-21
Cognitive functioning (MMSE score)			24.7	3.6	18-30
Length of stay (years)			2.6	2.5	0.2-12.6

SD, standard deviation; *MMSE*, Mini-Mental State Examination.

Table 3 Prevalence rates and 95% Confidence Intervals of Threshold and Subthreshold DSM-5 Anxiety Disorders among Residents of Aged Care Facilities ($n=180$)

Anxiety disorder	Current threshold disorders		Current subthreshold disorders ^a	
	<i>N</i>	% (95% CI)	<i>N</i>	% (95% CI)
Social anxiety disorder ^b	3	1.7 (0–5.0)	6	3.3 (1.1–7.3)
Panic disorder	3	1.7 (0–2.6)	0	0 (0–16.2)

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Agoraphobia ^c	5	2.8 (1.0 – 6.6)	7	3.9 (1.8 – 8)
Specific phobia ^{bd}	11	6.1 (2.6 – 9.6)	5	2.8 (1.0 – 6.6)
GAD	20	11.1 (6.5 – 15.7)	6	3.3 (1.4 – 7.3)
Any anxiety disorder	35	19.4 (13.6 – 25.2)	21	11.7 (7.0 – 16.4)

CI, confidence interval; GAD, Generalized Anxiety Disorder

^aA threshold anxiety disorder diagnosis excludes the diagnosis of the same subthreshold disorder.

^bN = 179

^cMost commonly cited situations to evoke anxiety symptoms were being in a crowd (threshold: 44.4%; subthreshold: 40.0%), being in an enclosed space (threshold: 33.3%; subthreshold: 30.0%), and being away from home (threshold: 22.2%; subthreshold: 20.0%).

^dPhobic stimuli included: the natural environment (threshold: 45.5%; subthreshold: 60.0%), animals/insects (threshold: 18.2%; subthreshold: 0%), blood-injection-injury (threshold: 18.2%; subthreshold: 0%), situational factors (threshold: 18.2%; subthreshold: 40.0%).

Table 4 Diagnosis of Any DSM-5 Threshold/Subthreshold Anxiety Disorder, Indication of Anxiety on File and Treatment of Anxious Participants

Cognitive function	Diagnosis of anxiety disorder	Anxiety recorded on medical file	Receiving an antidepressant medication	Receiving a benzodiazepine (regular or PRN)	Receiving an antipsychotic (regular or PRN)	Receiving psychological treatment	Receiving no treatment
Threshold anxiety disorders							
Normal (MMSE = ≥24)	22/115 (19.1%)	8/22 (36.4%)	15/22 (68.2%)	12/22 (54.5%)	2/22 (9.1%)	2/22 (9.1%)	6/22 (27.3%)
Mild impairment (MMSE = 18-23)	13/65 (20.0%)	6/13 (46.2%)	5/13 (38.5%)	9/13 (69.2%)	0/13 (0%)	1/13 (7.7%)	2/13 (15.4%)
Total	35/180 (19.4%)	14/35 (40.0%)	20/35 (57.1%)	21/35 (60.0%)	2/35 (5.7%)	3/35 (8.6%)	8/35 (22.9%)
Subthreshold anxiety disorders							
Normal (MMSE = ≥24)	15/115 (13%)	6/15 (40.0%)	10/15 (66.7%)	9/15 (60.0%)	1/15 (6.7%)	0/15 (0%)	3/15 (20.0%)
Mild impairment (MMSE = 18-23)	6/65 (9.2%)	2/6 (33.3%)	3/6 (50.0%)	3/6 (50.0%)	0/6 (0%)	0/6 (0%)	1/6 (16.7%)
Total	21/180 (11.7%)	8/21 (38.1%)	13/21 (61.9%)	12/21 (57.1%)	1/21 (4.8%)	0/21 (0%)	4/21 (19.0%)

PRN, pro re nata or 'as needed'; MMSE = Mini-Mental State Examination.

Table 5 Diagnosis of Specific DSM-5 Threshold/Subthreshold Anxiety Disorder, Indication of Anxiety on File and Treatment of Anxious Participants

Anxiety disorder	Anxiety recorded on medical file	Receiving an anti-depressant medication	Receiving a benzodiazepine (regular or PRN)	Receiving an antipsychotic (regular or PRN)	Receiving psychological treatment	Receiving no treatment
Threshold anxiety disorders						
Panic disorder	3/3 (100%)	1/3 (33.3%)	3/3 (100%)	0/3 (0%)	0/3 (0%)	0/3 (0%)
Social anxiety disorder	2/3 (66.7%)	2/3 (66.7%)	3/3 (100%)	0/3 (0%)	0/3 (0%)	0/3 (0%)
Agoraphobia	5/5 (100%)	4/5 (80.0%)	4/5 (80.0%)	1/5 (20.0%)	1/5 (20.0%)	1/5 (20.0%)
Specific phobia	2/11 (18.2%)	5/11 (45.5%)	5/11 (45.5%)	0/11 (0%)	1/11 (9.1%)	3/11 (27.3%)
GAD	8/20 (40.0%)	13/20 (65.0%)	13/20 (65.0%)	1/20 (5.0%)	2/20 (10.0%)	4/20 (20.0%)
Subthreshold anxiety disorders						
Social anxiety disorder	3/6 (50.0%)	4/6 (66.7%)	4/6 (66.7%)	1/6 (16.7%)	0/6 (0%)	1/6 (16.7%)
Agoraphobia	0/7 (0%)	5/7 (71.4%)	3/7 (42.9%)	0/7 (0%)	0/7 (0%)	1/7 (14.3%)
Specific phobia	3/5 (60.0%)	4/5 (80.0%)	4/5 (80.0%)	1/5 (20.0%)	0/5 (0%)	1/5 (20.0%)
GAD	4/6 (66.7%)	3/6 (50.0%)	4/6 (66.7%)	1/6 (16.7%)	0/6 (0%)	1/6 (16.7%)

Note. Subthreshold panic disorder was not included in the table as no participants met criteria for this diagnosis.

PRN, pro re nata or 'as needed'; *GAD*, Generalized Anxiety Disorder.

Highlights

- The prevalence of threshold and subthreshold anxiety disorders was 19.4% and 11.7%, respectively
- Generalized anxiety disorder was the most common threshold anxiety disorder
- Agoraphobia was the most common subthreshold anxiety disorder
- Less than half of participants with an anxiety disorder had an indication of anxiety on file
- The majority received psychotropic medication and cognition had no relationship with treatment