

What happens to anxiety disorders in later life?

Que ocorre com os transtornos da ansiedade na terceira idade?

Gerard JA Byrne

Department of Psychiatry, University of Queensland

Abstract Anxiety disorders decline in prevalence with advancing age but remain more common than depressive disorders. They are often of late-onset and there is frequent comorbidity with depressive disorders and physical illness. While anxiety disorders in older people are likely to respond to the same non-pharmacological interventions that have been shown to work in younger people, there is currently little formal evidence of this. Although there is some evidence that the non-benzodiazepine anxiolytic medication, buspirone, is effective against late life anxiety symptoms, clinical trials in older people with rigorously diagnosed anxiety disorders are needed. An anxiety scale with demonstrated reliability and validity in older people is needed for screening for pathological anxiety and for measuring change in older patients undergoing treatment for anxiety disorders.

Keywords Anxiety. Anxiety disorders. Aged. Panic. Agoraphobia. Phobia, social. Therapeutics. Case management. Comorbidity.

Resumo *A prevalência dos transtornos da ansiedade diminui com o envelhecimento, mas ainda assim é mais comum que os transtornos depressivos. Com frequência, os transtornos de ansiedade têm início tardio e estão associados a transtornos depressivos e doença física. Embora seja provável que os transtornos da ansiedade dos idosos respondam de forma adequada às mesmas intervenções não-farmacológicas que comprovadamente funcionam para o tratamento de pacientes jovens, há pouca evidência empírica disponível nessa área. Há também alguma evidência de que o tratamento ansiolítico com buspirona seja eficaz, mas ainda são necessários ensaios clínicos utilizando populações idosas e critérios rigorosos para o diagnóstico de transtornos da ansiedade. É necessária uma escala de ansiedade que seja comprovadamente confiável e válida para uso entre idosos a fim de auxiliar no processo de identificação de casos e medir a mudança na gravidade dos sintomas entre idosos que recebem tratamento para transtornos da ansiedade.*

Descritores *Ansiedade. Transtornos da ansiedade. Idoso. Pânico. Agorafobia. Fobia social. Terapêutica. Administração de caso. Comorbilidade.*

Introduction

The anxiety disorders are generally considered to include the following conditions: panic disorder, agoraphobia, social phobia, simple phobia, generalised anxiety disorder, post-traumatic stress disorder and obsessive-compulsive disorder. Anxiety disorders in older people have been less well studied than depression and dementia. This probably reflects the observation that older people most commonly present to clinical services with depression and dementia. It may also

indicate that the level of disability associated with the anxiety disorders is not always as great as the level of disability associated with the other disorders. The rapidly changing diagnostic criteria for some of the anxiety disorders, particularly generalised anxiety disorder, has also proved challenging to researchers. In particular, the hierarchical nature of the DSM-III diagnostic rules has meant that anxiety disorders could not be diagnosed in the presence of other psychiatric disorders such as depression or dementia.

Epidemiology of anxiety in later life***Prevalence of anxiety symptoms in later life***

Several early community surveys of anxiety symptoms that included older people were reported.¹⁻³ Two of these surveys^{1,3} found that older people reported more anxiety symptoms than younger people, whereas the other survey² found that approximately 10% of the population at any age had clinically significant anxiety symptoms. More recently, Himmelfarb & Murrell⁴ reported findings from a survey of middle aged and older people. These authors administered the trait half of the State Trait Anxiety Inventory (STAI)⁵ to 1338 females and 713 males aged 55 years and over living in the U.S. state of Kentucky. Anxiety varied inversely with education and socio-economic status. Although there was a complex relationship between anxiety and age, the general tendency was for anxiety to increase with advancing age. Overall, 17% of males and 22% of females reported levels of anxiety symptoms thought to warrant treatment.

Against this background, Henderson et al⁶ surveyed a general population sample of 2725 people aged between 18 and 79 years living in Australia using two inventories of depressive and anxiety symptoms and found that the prevalence of both declined with advancing age. They noted that some risk factors for depression and anxiety, including neuroticism and adverse life events, also declined with advancing age. Henderson et al⁶ noted that unless their sample was affected by a participation bias their findings supported the view that depressive and anxiety symptoms actually do decline with increasing age.

In summary, although historically there has been divided opinion about whether anxiety symptoms decline in later life more recent work supports this conclusion.

Overall prevalence of anxiety disorders in older people

The overall prevalence of the anxiety disorders in people aged 65 years and over has been estimated in several large-scale surveys, with more recent studies producing prevalence estimates varying from 0.9% to 15.0% (Table). Much of this variation is likely to be due to the use of different diagnostic instruments and different diagnostic algorithms. In the Epidemiologic Catchment Area (ECA) study, subjects were interviewed using the Diagnostic Interview Schedule (DIS),⁷ which generated DSM-III anxiety diagnoses other than Generalised Anxiety Disorder (GAD). The one-month prevalence of any anxiety disorder (other than GAD) for subjects aged 65 years and over from five U.S. sites (N=5,702) was found to be 6.8%.⁸ The New Haven, Connecticut, site of the ECA study over sampled older people, with the final study sample including 2,588 community residing individuals aged 65 years or over.⁹ At this site, the six-month prevalence of any anxiety disorder (including somatization but not GAD) was 4.6%. In a similar study conducted in Edmonton, Canada¹⁰ 358 community residing older people were interviewed with the DIS. The six-month prevalence rate of any anxiety disorder (including somatization but not GAD) was found to be 3.5%. Copeland et al¹¹ assessed 1,070 elderly Liverpool, England,

general practitioner patients using the Geriatric Mental State schedule and its associated diagnostic algorithm (GMS/AGECAT). They found only 26 subjects (2.4%) who met criteria for neurosis caseness, including 10 subjects (0.9%) who met criteria for anxiety neurosis caseness. The same group found similar levels of caseness in London but lower levels of caseness in New York.¹² Banerjee¹³ surveyed 169 elderly residents of Lewisham, London, who were receiving home care services, using the GMS/AGECAT system. Four residents (2.4%) were categorized as cases of anxiety disorder and 24 (14.2%) as sub cases. Manela et al¹⁴ surveyed 694 residents of the deprived London suburb of Islington using the Anxiety Disorder Scale (ADS)¹⁵ and found the prevalence of anxiety disorders (including generalised anxiety) to be 15.0%. A recent Australian survey¹⁶ found the overall prevalence of anxiety disorders in people aged 65 years and over to be 4.5%. Studies that employed less rigorous diagnostic approaches have also been reported.^{17,18} These latter studies generated estimates of caseness much greater than those generated by the more rigorous studies already reviewed.

Table - Prevalence of anxiety disorders in older people.

Reference	Diagnostic system	Prevalence
Weissman et al ⁹	DIS/DSM-III	4.6%
Copeland et al ¹¹	GMS/AGECAT	0.9%
Regier et al ⁸	DIS/DSM-III	5.5%
Bland et al ¹⁰	DIS/DSM-III	3.5%
Banerjee ¹³	GMS/AGECAT	2.4%
Manela et al ¹⁴	ADS	15.0%
Beekman et al ²³	DIS/DSM-III	10.2%
McLennan ¹⁶	CIDI/ICD-10	4.5%

In both the ECA and Australian surveys, the prevalence of anxiety disorders in older people was significantly lower than that in young and middle age people. This observation has led to concern that the measures used to diagnose anxiety disorders in epidemiological surveys may be systematically biased against making these diagnoses in older people. Concern has also arisen that anxiety disorders may be associated with excess mortality among young and middle age persons contributing to the observed lower prevalence of anxiety disorders in older people. Some commentators have been concerned also that many older people with anxiety disorders may not agree to participate in community surveys or may be too medically ill to do so. Jorm¹⁹ reviewed studies that had examined the prevalence of anxiety and depressive disorders and symptoms across the lifespan. He concluded that neither excess mortality nor exclusion of institutionalised patients from community surveys could explain the lower prevalence of depressive and anxiety symptoms and disorders in older people.

Prevalence of specific anxiety disorders in older people

The prevalence of individual anxiety disorders in later life has also been studied and will now be briefly summarised. It should be noted, however, that because of the relatively small samples recruited to studies of anxiety disorders in older

people, the uncertainty associated with estimates of the prevalence of individual anxiety disorders is likely to be considerably greater than the uncertainty associated with estimates of the prevalence of the anxiety disorders as a group. Estimates of the prevalence of generalised anxiety disorder in older people have varied between 0.7 and 7.1%, although the ECA study did not report prevalence data for this condition.^{11,12,14,15} One problem with being confident of the prevalence of generalised anxiety disorder is that the diagnostic criteria for this condition have changed considerably over the past twenty years. Estimates of the prevalence of phobic disorders in older people have varied between 0.0 and 12.0% with more recent estimates tending to support the higher figure.^{14,15,20} Much of this variation is due to the use of differing diagnostic criteria including the presence or absence of hierarchical diagnostic rules. The limited available evidence suggests that most cases of simple phobia in older people have arisen early in life whereas most cases of agoraphobia have arisen late in life. Agoraphobia in older people is not commonly associated with panic disorder but rather with physical illness or adverse life events. There is general consensus that panic disorder is the least common anxiety disorder in later life with prevalence estimates varying between 0.0 and 0.3%.^{8,14,15,21} Most, if not all, cases of panic disorder among older people occur in women. Obsessive-compulsive disorder is generally considered to be uncommon among community-residing older people with estimates of its prevalence varying between 0.0 and 1.5%.^{20,22,23} It may arise for the first time in later life but generally arises before the age of 65 years. Whilst surveys of Holocaust and POW camp survivors have found high rates of post-traumatic stress disorder (PTSD), the prevalence of the condition in unselected community samples of older people is uncertain.²⁰

Incidence of anxiety disorders in older people

Little is known about the *incidence* of anxiety disorders in later life. In addition, it is not clear what proportion of anxiety disorders are of early and late onset. Larkin et al,²⁴ in a three-year follow-up of the Liverpool sample, found the incidence of neurotic disorders among older people to be 4.4/1000 per year. In the Guy's/Age Concern survey, Lindesay²⁵ found that in one third of cases phobic disorders had had their onset after the age of 65 years. However, the majority of cases of agoraphobia were of late onset and followed serious physical illness or injury.

Anxiety disorders in special populations of older people

Some studies have estimated the prevalence of anxiety disorders in special populations of older people. Juninger et al²⁶ found the prevalence of SCID/DSM-III-R anxiety disorders in 100 Baton Rouge, Louisiana, nursing home residents to be 20%. Diagnostic criteria for GAD were met by 6% of residents. The prevalence of anxiety disorders was assessed in the residents of five Sydney, Australia, nursing homes using a questionnaire.²⁷ Only residents with MMSE scores of 18 or greater were included in the study. Twelve of 107 (11.2%)

nursing home residents reported symptoms of generalised anxiety. However, a subsequent psychiatric interview using DSM-III-R criteria found that only 3 of the 12 (2.8% of the total) met diagnostic criteria for GAD. A consecutive series of stroke patients (N=309) admitted to hospital in Baltimore, Maryland, was assessed with a modified version of the Present State Examination.²⁸ DSM-II-R criteria for GAD were present in 25% of patients. A population-based prospective study of 80 Swedish stroke patients with a mean age of 73 years²⁹ found the prevalence of DSM-III-R Generalised Anxiety Disorder to be 28%. Teri et al³⁰ studied the prevalence of anxiety and other symptoms in 523 community-residing patients with Alzheimer's disease using a 21-item checklist. Seventy percent of subjects had one or more anxiety symptoms and 57% had two or more anxiety symptoms. However, anxiety disorders were not assessed.

Psychiatric comorbidity of anxiety disorders in older people

There is evidence of substantial comorbidity between different specific anxiety disorders and between anxiety disorders and depressive disorders in people of all ages. However, among older patients with anxiety disorders there is uncertainty about which disorder is more likely to have developed first. Mulsant et al³¹ studied the prevalence of comorbid anxiety disorder in 336 older patients with Major Depressive Disorder. Among 177 outpatients, 15 (8.5%) met diagnostic criteria for a lifetime comorbid anxiety disorder. However, no inpatients met diagnostic criteria for a current anxiety disorder. Among 159 outpatients, 9 (5.7%) met diagnostic criteria for a current anxiety disorder and 13 (8.2%) met diagnostic criteria for a lifetime anxiety disorder. In the Longitudinal Aging Study Amsterdam, Beekman et al³² studied 659 community-based subjects aged between 55 and 85 years with the Center for Epidemiologic Studies Depression Scale (CES-D)³³ and the Diagnostic Interview Schedule (DIS). They found that 111 subjects (16.8%) met diagnostic criteria for an anxiety disorder, mainly generalised anxiety disorder and social phobia. Of those with an anxiety disorder, 26.1% also met diagnostic criteria for major depressive disorder and of those with major depressive disorder, 47.5% also met diagnostic criteria for an anxiety disorder.

Measurement of anxiety symptoms in later life

A measure of dimensional anxiety specifically designed for use in older people is urgently needed. Such a measure might be used in a variety of settings to screen for patients likely to be suffering from anxiety disorders and to measure change over time in patients having treatment for an anxiety disorder. Although several such measures have been assessed, all have been found wanting. Several of these measures are now reviewed.

Among clinician-rated measures, only the Hamilton Anxiety Rating Scale (HAM-A)³⁴ has been examined in older subjects with rigorously diagnosed anxiety disorder. Beck & Steer³⁵ found that the HAM-A discriminated well between older subjects with Generalised Anxiety Disorder (GAD) and nor-

mal control subjects. However, the use of the HAM-A has been called into question in older people because of its heavy reliance upon somatic items.

Among self-report measures, the Spielberger State-Trait Anxiety Inventory (STAI)⁵ was used in some early studies of older people,^{4,36} although these studies did not report specific diagnostic data. More recent evidence suggests that the state component of the STAI does not adequately distinguish between older patients with current anxiety disorders and those without such disorders.³⁷ The Beck Anxiety Inventory (BAI)³⁵ has been used also in several studies.³⁷⁻³⁹ These studies provide some evidence that the BAI may be able to distinguish between older people with and without clinically significant anxiety. However, the BAI also relies heavily upon somatic items, making its use in medically ill older people potentially problematic. The Hospital Anxiety and Depression Scale (HADS)⁴⁰ has been found to lack sensitivity and specificity as a screening instrument for anxiety and depressive disorders in older people diagnosed using the Geriatric Mental State schedule (GMS).⁴¹ A four-item version of the 11-item Anxiety Disorder Scale (ADS) called the FEAR⁴² has been proposed as a rapid screening measure for non-hierarchical clinical ICD-10 diagnoses of generalised anxiety disorder in older people. However, it seems that the FEAR has not yet been tested independently of the ADS. A French language version of Goldberg's 18-item depression and anxiety inventory⁴³ was used to detect depression and anxiety disorders in hospitalised elderly patients.⁴⁴ Whilst the inventory demonstrated satisfactory sensitivity, the subscales lacked specificity for each type of disorder.

A measure that was specifically developed to measure anxiety in older people has recently been described. The Short Anxiety Screening Test (SAST)⁴⁵ is a 10-item self-report instrument with a four-point response scale generating scores between 10 and 40. Four of the 10 items assess somatic symptoms (pain, palpitations, sleep, dizziness), potentially limiting the ability of the scale to distinguish between anxiety and somatic symptoms. On the basis of pilot data, subjects scoring greater than 23 on the SAST were said to have a "diagnosis of anxiety". In the only published study using the instrument,⁴⁵ the SAST was administered to 150 geriatric medical patients with a mean age of 82 years. DSM-IV diagnoses were established using a modified version of the Anxiety Disorders Interview Schedule (ADIS-IV).⁴⁶ SAST test-retest reliability was good ($r_p = 0.73$; $p < 0.0001$). The SAST was found to have sensitivity of 75.4%, specificity of 78.7%, positive predictive value of 70.8% and negative predictive value of 82.4% against modified ADIS-IV interviews by a psychiatrist. However, the performance of the SAST in relation to individual DSM-IV anxiety disorders was not disclosed. Nor is it clear whether the SAST is sensitive to change when anxiety disorders are treated. It is unclear whether the SAST will have clinical utility in older people seen in mental health settings.

Measures of worry,^{47,48} obsessional thinking,⁴⁹ phobias,⁵⁰ anxiety about ageing,⁵¹ retirement anxiety⁵² and death anxiety⁵³ have also been studied in older subjects. However, as these measures are all rather narrowly focussed, they will not be discussed any further here.

The ideal measure of dimensional anxiety in older people is yet to be developed. It is likely that such a measure would distinguish well between older people with and without anxiety disorders, particularly GAD, distinguish anxiety disorders from depressive disorders, and distinguish medically ill people with an anxiety disorder from medically ill people without an anxiety disorder. Properties of the Geriatric Depression Scale (GDS)⁵⁴ such as a dichotomous response scale, the absence of somatic items and careful attention to the wording of scale items might be important features of such a new scale. However, there is a need for more normative data for existing anxiety measures from older people of both genders⁵⁵ and different cultures. There is also a need for normative data that come from both the 'young' old and the 'old' old.

Clinical features

Very little published work has looked systematically at the similarities and differences between the clinical features of anxiety disorders occurring in younger and older people. Schuab & Linden⁵⁶ found that the symptomatology of anxiety disorders in later life was similar to that in younger people. Sheikh et al⁵⁷ surveyed 520 adults with panic attacks, of whom 445 were younger than 55 years and 75 were aged 55 years or older. Of the 75 older subjects, 57 (76%) had their first panic attack before the age of 55 years and 18 (24%) had their first panic attack after the age of 55 years. Those with late-onset panic attacks reported fewer symptoms during their panic attacks and were generally less avoidant.

A aetiology of anxiety disorders in later life

The aetiology of anxiety disorders in later life is, for the most part, obscure. However, as previously noted, Lindsay²⁵ found that most late life cases of agoraphobia were of recent onset and came on following serious illness or injury. The apparently high prevalence of anxiety disorders in patients with dementia or following stroke certainly suggests organic factors in at least some cases. However, the overall decline in the prevalence of anxiety disorders with advancing age suggests the presence of one or more general protective factors associated with ageing. One possible biological protective factor is a reduction in the responsiveness of the central noradrenergic neurotransmitter system together with relatively preserved inhibitory gamma amino butyric acid (GABA) activity in the central nervous system. From the psychological perspective, it may be that older people have been inoculated against the anxiety generating effects of adverse life events by repeated exposure earlier in life. Or perhaps the declining prevalence of both neuroticism and adverse life events in later life, together with the apparent increase in available social support, are protective against anxiety disorders as well as depressive disorders.⁶

Treatment of anxiety disorders

Non-pharmacological treatment

Several studies have investigated the non-pharmacological treatment of anxiety *symptoms* in older people. However, there

appears to be only one study of non-pharmacological treatment of a defined anxiety disorder.⁵⁸ In a study of 48 relatively young (mean age 68 years) older people with Generalised Anxiety Disorder, subjects were randomly assigned to either cognitive behaviour therapy (CBT) or to supportive psychotherapy (SP).⁵⁹ Each treatment was conducted in a small-group setting over 14 weeks. Thirty-one patients (65%) completed treatment. In a responder analysis, 28% of subjects randomised to CBT and 54% of subjects randomised to SP were found to have responded to treatment. Although there is no obvious *a priori* reason why older people with anxiety disorders should not respond to treatment with similar non-pharmacological interventions to those demonstrated to be effective in younger people, it is likely that modified treatment approaches will be needed. For instance, some of the components of CBT require modification for use in older people.⁶⁰

Pharmacological treatment

There appear to be no studies of pharmacological interventions for rigorously diagnosed anxiety disorders in older people. However, studies of buspirone⁶¹ and alpidem⁶² in anxious older people have been reported. In a 4-week study,⁶¹ 40 anxious subjects with a mean age of 72 years were randomised to either placebo or buspirone 15–30 mg per day in divided doses. Mean scores on the Hamilton Rating Scale for Anxiety (HAM-A) fell from 22.9 to 6.4 in subjects assigned to buspirone and from 22.1 to 15.8 in subjects assigned to placebo ($p < 0.005$). In clinical use, buspirone has been found to be a useful adjunct to the non-pharmacological management of anxiety in benzodiazepine naïve patients. In a 3-week study,⁶² 40 anxious subjects who ranged in age between 65 and 80 years were randomised to either placebo or alpidem 75–150 mg per day (most common dose 75 mg per day). On a variety of outcome measures, including the HAM-A and the STAI, alpidem was superior to placebo ($p < 0.01$) and the anxiolytic action was evident after seven days of treatment. The authors reported no impairment of psychomotor or memory

performance with this anxiolytic. However, alpidem was subsequently withdrawn from the market after several reports of hepatotoxicity, some of them fatal.

In relation to the pharmacological management of anxiety disorders in older people, the use of benzodiazepines has significant risks. These include confusion, amnesia, ataxia and falls. Thus, alternative pharmacological strategies are required. The use of newer antidepressants with proven efficacy in anxiety disorders in younger adults seems appropriate, although there is a conspicuous absence of randomised controlled trial data in older people.

Conclusions

Although anxiety symptoms remain commonplace amongst older people, the prevalence of the anxiety disorders appears to decrease with advancing age. As is the case for depressive disorders, older women remain more susceptible than older men. Anxiety disorders appear to be more prevalent among nursing home residents and older people with medical conditions such as stroke and dementia. However, little is known about the specific clinical features of anxiety disorders in older people and whether these differ from the clinical features of anxiety disorders in younger people. A suitable scale to measure generalised anxiety in older people is yet to be developed. Not much is known about the evidence-based management of anxiety disorders in older people. Very few clinical trials of pharmacological agents have been undertaken in older people with anxiety disorders. The limited available evidence derived from a single clinical trial conducted in older people with anxiety symptoms favours the use of the non-benzodiazepine anxiolytic buspirone. Further investigation of non-pharmacological interventions is urgently needed. Thus, there are great opportunities for mental health personnel who work with older people to advance clinical knowledge in the assessment and management of anxiety disorders.

Acknowledgements

The author would like to thank Dr Nancy Pachana for useful discussions and Ms Liz Arnold for her essential assistance.

References

1. Gurin G, Veroff J, Feld S. Americans view their mental health. New York: Basic Books; 1963.
2. Leighton DC, Harding JS, Macklin DB, MacMillan AM, Leighton AH. The character of danger: Psychiatric symptoms in selected communities. New York: Basic Books; 1963.
3. Gaitz CM, Scott J. Age and the measurement of mental health. Health Soc Behav 1972;13:55-67.
4. Himmelfarb S, Murrell SA. The prevalence and correlates of anxiety symptoms in older adults. J Psychol 1984;116:159-67.
5. Spielberger CD, Gorsuch RL, Lushen RE. Manual for the State-Trait Anxiety Inventory (STAI). Palo Alto: Consulting Psychologists Press; 1970.
6. Henderson AS, Jorm AF, Korten AE, Jacomb P, Christensen H, Rodgers B. Symptoms of depression and anxiety during adult life: evidence for a decline in prevalence with age. Psychol Med 1998;28:1321-8.
7. Endicott J, Spitzer RL. A diagnostic interview: The schedule for affective disorders and schizophrenia. Arch Gen Psychiatry 1978;35:837-44.

8. Regier DA, Boyd JH, Burke JD, Rae DS, Myers JK, Kramer M, et al. One-month prevalence of mental disorders in the United States: based on five epidemiologic catchment area sites. *Arch Gen Psychiatry* 1988;45:977-86.
9. Weissman MM, Myers JK, Tischler GL, Holzer I, Leaf PJ, Orvaschel H, et al. Psychiatric disorders (DSM-III) and cognitive impairment among the elderly in a US urban community. *Acta Psychiatr Scand* 1985;71:366-79.
10. Bland RC, Newman SC, Orn H. Prevalence of psychiatric disorders in the elderly in Edmonton. *Acta Psychiatr Scand* 1988;77(suppl 338):57-63.
11. Copeland JR, Searle R, Davidson IA, McWilliam C. Range of mental illness among the elderly in the community: prevalence in Liverpool using the GMS-AGECAT package. *Br J Psychiatry* 1987;150:815-23.
12. Copeland JRM, Gurland BJ, Dewey ME, Kelleher MJ, Smith AMR, Davidson IA. The distribution of dementia, depression, and neurosis in elderly men and women in an urban community: assessed using the GMS-AGECAT package. *Int J Geriatr Psychiatry* 1987;2:177-84.
13. Banerjee S. Prevalence and recognition rates of psychiatric disorder in the elderly clients of a 'community care' service. *Int J Geriatr Psychiatry* 1993;8:125-31.
14. Manela M, Katona C, Livingston G. How common are the anxiety disorders in old age? *Int J Geriatr Psychiatry* 1996;11:65-70.
15. Lindsay J, Briggs K, Murphy E. The Guy's/age concern survey: prevalence rates of cognitive impairment, depression and anxiety in an urban elderly community. *Br J Psychiatry* 1989;155:317-29.
16. McLennan W. National survey of mental health and wellbeing. Canberra: Australian Bureau of Statistics; 1999.
17. Uhlenhuth EH, Balter MB, Mellinger GD, Cisin IH, Clinthorne J. Symptom checklist syndromes in the general population. Correlations with psychotherapeutic drug use. *Arch Gen Psychiatry* 1983;40:1167-73.
18. Maule MM, Milne JS, Williamson J. Mental illness and physical health in older people. *Age Ageing* 1984;13:349-56.
19. Jorm AF. Does old age reduce the risk of anxiety and depression? a review of epidemiological studies across the adult life span. *Psychol Med* 2000;30:11-22.
20. Flint AJ. Epidemiology and comorbidity of anxiety disorders in the elderly. *Am J Psychiatry* 1994;151:640-9.
21. Flint AJ, Cook JM, Rabins PV. Why is panic disorder less frequent in late life? *Am J Geriatr Psychiatry* 1996;4:96-109.
22. Krasucki C, Howard R, Mann A. The relationship between anxiety disorders and age. *Int J Geriatr Psychiatry* 1998;13:79-99.
23. Beekman AT, Bremner MA, Deeg DJ, van Balkom AJ, Smit JH, de Beurs E, et al. Anxiety disorders in later life: a report from the longitudinal aging study Amsterdam. *Int J Geriatr Psychiatry* 1998;13:717-26.
24. Larkin BA, Copeland JRM, Dewey ME, Davidson IA, Saunders PA, Sharma VK, et al. The natural history of neurotic disorder in an elderly urban population: findings from the Liverpool longitudinal study of continuing Health in the Community. *Br J Psychiatry* 1992;60:681-6.
25. Lindsay J. Phobic disorders in the elderly. *Br J Psychiatry* 1991;159:531-41.
26. Juninger J, Phelan E, Cherry K, Levy J. Prevalence of psychopathology in elderly persons in nursing homes and in the community. *Hosp Community Psychiatry* 1993;44:381-3.
27. Cheok A, Snowdon J, Miller R, Vaughan R. The prevalence of anxiety disorders in nursing homes. *Int J Geriatr Psychiatry* 1996;11:405-10.
28. Castillo CS, Starkstein SE, Fedoroff JP, Price TR, Robinson RG. Generalized anxiety disorder after stroke. *J Nerv Mental Dis* 1993;181:100-6.
29. Astrom M. Generalized anxiety disorder in stroke patients: a 3-year longitudinal study. *Stroke* 1996;27:270-5.
30. Teri L, Ferretti LE, Gibbons LE, Logsdon RG, McCurry SM, Kukull WA, et al. Anxiety of Alzheimer's disease: prevalence, and comorbidity. *J Gerontol A Biol Sci Med Sci* 1999;54:M348-52.
31. Mulsant BH, Reynolds CF-3rd, Shear MK, Sweet RA, Miller M. Comorbid anxiety disorders in late-life depression. *Anxiety* 1996;2:242-7.
32. Beekman AT, de Beurs E, van Balkom AJ, Deeg DJ, van Dyck R, van Tilburg W. Anxiety and depression in later life: co-occurrence and communality of risk factors. *Am J Psychiatry* 2000;157:89-95.
33. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *App Psychol Meas* 1977;1:385-401.
34. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol* 1959;32:50-5.
35. Beck AT, Steer RA. Relationship between the beck anxiety inventory and the Hamilton anxiety rating scale with anxious outpatients. *J Anxiety Dis* 1991;5:213-23.
36. Patterson RL, Sullivan MJ, Spielberger CD. Measurement of state and trait anxiety in elderly mental health clients. *J Behav Assess* 1980;2:89-96.
37. Kabacoff RI, Segal DL, Hersen M, Van Hasselt VB. Psychometric properties and diagnostic utility of the Beck anxiety inventory and the state-trait anxiety inventory with older adult psychiatric outpatients. *J Anxiety Disord* 1997;11:33-47.
38. Wetherell JL. Treatment of anxiety in older adults. *Psychother Theory Res Pract Train* 1998;35:444-58.
39. Morin CM, Landreville P, Colecchi C, McDonald K, Stone J, Ling W. The beck anxiety inventory: psychometric properties with older adults. *J Clin Geropsych* 1999;5:19-29.
40. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983;67:361-70.
41. Davies KN, Burn WK, McKenzie FR, Brothwell JA, Watters JP. Evaluation of the hospital anxiety and depression scale as a screening instrument in geriatric medical inpatients. *Int J Ger Psychiatry* 1993;8:165-9.
42. Krasucki C, Ryan P, Ertan T, Howard R, Lindsay J, Mann A. The FEAR: a rapid screening instrument for generalized anxiety in elderly primary care attenders. *Int J Geriatr Psychiatry* 1999;14:60-8.
43. Goldberg DP, Bridges K, Duncan-Jones P, Grayson D. Dimensions of neuroses seen in primary care settings. *Psychol Med* 1987;17:461-70.
44. Huber P, Mulligan R, Mackinnon A, Nebuloni-French T, Michel JP. Detecting anxiety and depression in hospitalised elderly patients using a brief inventory. *Eur Psychiatry* 1999;14:11-6.
45. Sinoff G, Ore L, Zlotogorsky D, Tamir A. Short anxiety screening test—a brief instrument for detecting anxiety in the elderly. *Int J Geriatr Psychiatry* 1999;14(12):1062-71.
46. Brown TA, Barlow DH, Liebowitz MR. The empirical basis of generalized anxiety disorder. *Am J Psychiatry* 1994;151:1272-80.
47. Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the penn state worry questionnaire. *Behav Res Ther* 1990;28:487-95.
48. Wisocki PA. The worry scale as a measure of anxiety among the elderly: a clinical comment. *Clin Gerontology* 1986;4:50-2.
49. Sanavio E. Obsessions and compulsions: the Padua inventory. *Behav Res Ther* 1988;26:169-177.
50. Geer JH. The development of a scale to measure fear. *Behav Res Ther* 1965;3:45-53.
51. Watkins RE, Coates R, Ferroni P. Measurement of aging anxiety in an elderly Australian population. *Int J Aging Hum Dev* 1998;46:319-32.
52. Fletcher WL, Hansson RO. Assessing the social components of retirement anxiety. *Psychol Aging* 1991;6:76-85.

53. Conte HR, Weiner MB, Plutchik R. Measuring death anxiety: conceptual, psychometric, and factor-analytic aspects. *J Pers Soc Psychol* 1982;43:775-85.
54. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, et al. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res* 1983;39:37-49.
55. Owens KMB, Hadjistavropoulos T, Asmundson GJG. Addressing the need for appropriate norms when measuring anxiety in seniors. *Aging Mental Health* 2000;4:309-14.
56. Schaub RT, Linden M. Anxiety and anxiety disorders in the old and very old—results from the Berlin aging study (BASE). *Compr Psychiatry* 2000;41(2 Suppl 1):48-54.
57. Sheikh J, King R, Taylor CB. Comparative phenomenology of early-onset versus late-onset panic attacks: a pilot survey. *Am J Psychiatry* 1991;148:1231-3.
58. Stanley MA, Novy DM. Cognitive-behavior therapy for generalized anxiety in late life: an evaluative overview. *J Anxiety Disord* 2000;14:191-207.
59. Stanley MA, Beck JG, Zebb BJ. Psychometric properties of four anxiety measures in older adults. *Behav Res Ther* 1996;34:827-38.
60. Gallagher-Thompson D, Thompson LW. Applying cognitive-behavioural therapy to the psychological problems of later life. In: Zarit SH, Knight BG, editors. *A guide to psychotherapy and aging: effective clinical interventions in a life stage context*. Washington (DC): American Psychological Association; 1996. p. 61-82.
61. Bohm C, Robinson DS, Gammans RE, Shrotriya RC, Alms DR, Leroy A, et al. Buspirone therapy in anxious elderly patients: a controlled clinical trial. *J Clin Psychopharm* 1990;10(3 suppl):47s-51s.
62. Frattola L, Piolti R, Bassi S, Albizzati MG, Cezana BM, Bottani MS, et al. Effects of alpidem in anxious elderly outpatients: a double-blind, placebo-controlled trial. *Clin Neuropharmacol* 1992;15:477-87.

Correspondence: Gerard Byrne

Department of Psychiatry, University of Queensland – K Floor, Mental Health Centre, Royal Brisbane Hospital, Queensland 4029, Australia

Tels.: (+61) (7) 3365-5148/ Fax: (+61) (7) 3365-5488 – E-mail: g.byrne@psychiatry.uq.edu.au
