

## Depression in older adults

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### Abstract

Despite being the most common mental disorder in older adults, depression is under-recognised. It poses diagnostic difficulties in this population for several reasons; for example, symptomatic and phenomenological differences, age-related biological and psychological factors, and the presence of physical comorbidities. Depression in older adults is an important clinical topic because outcomes are worse in comparison to younger adults. It is also associated with higher rates of morbidity and mortality, increased healthcare utilisation and economic costs. It is likely to become a more pressing issue in the future due to the projected increase in the older adult population. This article explores the topic of depression in older adults.

### Introduction

Depression is a clinical syndrome. The International Classification of Diseases (ICD) diagnostic classification systems describe three core symptoms of depression; low mood, anhedonia and reduced energy levels<sup>1</sup>. Other symptoms include impaired concentration, loss of confidence, suicidal ideation, disturbances in sleep and changes in appetite. Symptoms must have been present for at least a period of two weeks for a diagnosis of depression to be made. Major depression refers to the presence of all three core symptoms and, in accordance with ICD criteria, at least the presence of a further five other symptoms<sup>1</sup>. See Table 1 for severity criteria of a depressive episode according to ICD criteria.

Depressive symptoms, which can be clinically significant, can be present in the absence of a major depressive episode. Depressive symptoms are those that do not fulfil diagnostic criteria for a diagnosis of depression to be made. Depressive symptoms can be collectively referred to as sub-threshold depression, sub-syndromal depression or minor depression<sup>2</sup>.

It has been proposed that there are two types of depression; early-onset and late-onset depression. Late-onset depression refers to a new diagnosis in individuals aged 65 years of age or older. Over half of all cases of depression in older adults are newly arising (i.e. the individual has never experienced depression before) and thus late-onset type depression. Late-onset type depression is associated more with structural brain changes, vascular risk factors and cognitive deficits. It has been suggested that late-onset depression could be prodromal to dementia<sup>3</sup>.

The Kings Fund has estimated that by 2032 the proportion of older adults aged 65-84 years old will have increased by 39% whereas the proportion over the age of 85 years will have increased by 106%<sup>4</sup>. This increase in population will

consequently see the incidence and prevalence of depression rise. By 2020 it is estimated that depression will be the second leading cause of disability in the world regardless of age<sup>5</sup>. Recognising, and so diagnosing, depression in older adults will become more important because of a greater demand on existing healthcare services and provisions, due to physical health consequences, impact upon healthcare utilisation and greater economic healthcare costs.

**Table 1: Severity criteria of a depressive episode according to ICD-10<sup>1</sup>**

Criteria A – General:	Criteria B – Presence of ≥2 of the following:	Criteria C – ‘Other’ symptoms:
Symptoms for at least 2 weeks Symptoms not attributable to psychoactive substance use or organic mental disorder	Low mood Anhedonia Reduced energy levels/ increased fatigability	Loss of confidence and self-esteem Feelings of guilt Suicidal thoughts Impaired concentration/ability to think Changes in psychomotor activity Sleep disturbance Changes in appetite with weight changes
Criteria for severity of depressive episode:		
<b>Mild episode:</b> 2 symptoms of criteria B	<b>Moderate episode:</b> ≥2 symptoms of criteria B + symptoms of criteria C until minimum of 6 symptoms in total	<b>Major episode:</b> all 3 symptoms of criteria B + symptoms of criteria C until a minimum of 8 symptoms in total

### Presentation of depression in older adults

The presentation of depression in older adults is markedly different to that in younger adults. The most significant and

fundamental difference in presentation in older adults is that depression can be present with the absence of an affect component, i.e. subjective feelings of low mood or sadness are not experienced<sup>3,6-9</sup>. The absence of an affective component is referred to as 'depression without sadness'<sup>8-9</sup>. It is common instead for older adults to report a lack of feeling or emotion when depressed<sup>8-9</sup>.

Anhedonia is also less prevalent in this population. However, reduced energy levels and fatigue are frequently reported<sup>8-9</sup>.

Compared to younger adults, psychological symptoms of depression occur more frequently and are more prevalent in older adults<sup>10</sup>. Such psychological symptoms include feelings of guilt, poor motivation, low interest levels, anxiety related symptoms and suicidal ideation. The presence of irritability and agitation are key features as well<sup>7</sup>. Hallucinations and delusions are also more common in older adults, particularly nihilistic delusions (i.e. a person believing their body is dead or a part of their body is not working properly or rotting).

Cognitive deficits are characteristic of depression in older adults<sup>7,11</sup> and are described as 'substantial and disabling'<sup>12</sup>. Such deficits mainly concern executive function<sup>13-14</sup>. Pseudodementia is a phenomenon seen in older adults<sup>15</sup>. The term refers to cognitive impairment secondary to a psychiatric condition, most commonly depression<sup>16</sup>. Pseudodementia has become synonymous with depression. Pseudodementia can be mistaken for an organic dementia and so older adults who are depressed can present primarily to mental health services with memory problems. Pseudodementia is classically associated with 'don't know' answers, whereas older adults with a true dementia will often respond with incorrect answers<sup>17</sup>.

'Depression-executive dysfunction syndrome' is a more specific and descriptive term to describe the cognitive deficits found in older adults with depression<sup>14</sup>. It is associated with psychomotor retardation, which can be a core feature of depression in this population<sup>7,14,18</sup>. Psychomotor retardation describes a slowing of movement and mental activity<sup>19</sup>. Like pure cognitive deficits, psychomotor retardation contributes significantly to functional impairment<sup>19</sup>. Both executive dysfunction and psychomotor retardation have been found to be related to underlying structural changes in the frontal lobes<sup>14, 20-21</sup>. Psychomotor retardation is further related to white matter changes in the motor system, which leads to impaired motor planning<sup>21</sup>. There is conflicting evidence of whether the presence of psychomotor retardation is related to depression severity<sup>18-19</sup>.

Somatisation and hypochondriasis are associated with depression in older adults and increasing age in general<sup>22-23</sup>. Somatisation is often overlooked in older adults by healthcare professional who actively search to attribute such symptoms to a physical cause. Somatisation is more common in those who have physical comorbidities. Somatisation in older adults is associated with structural brain changes and cognitive deficits<sup>24</sup>.

Depression in older adults is associated with functional impairment cognitively, physically and socially<sup>7,12,25</sup>. Such functional impairment is linked to loss of independent function and increased rates of disability<sup>26</sup>. Withdrawal from normal social and leisure activities can be marked<sup>7,25</sup>. Social avoidance reduces interaction with others and is often a maintaining factor for depression<sup>25</sup>.

Self-neglect is a classical feature of depression<sup>7</sup>, with the presence of depressive symptoms in older adults being predictive of it<sup>27</sup>. Behavioural disturbances can be a common mode of presentation, especially for older adults living in institutionalised care<sup>6-7</sup>. Behavioural disturbances include incontinence, food refusal, screaming, falling and violence towards others<sup>7</sup>.

### Diagnostic difficulties

Depression in older adults has been a condition that has constantly been under-recognised. Several issues account for this. Firstly, phenomenological differences are present. Many have argued that phenomenological issues contribute heavily to diagnostic difficulties<sup>28</sup>; both the DSM and ICD classification systems do not have specific diagnostic criteria for depression in older adults. Potentially invalid diagnostic criteria for depression in older adults could result in fundamental difficulties in understanding, with consequent impact on both clinical practice and research.

Diagnostic difficulties are also encountered because depression in older adults can present with vague symptoms, which do not correspond to the classical triad of low mood, low energy levels and anhedonia, which can all be cardinal symptoms in a younger population. Reports of fatigue, poor sleep and reduced appetite can be attributed to a host of causes other than depression and therefore it is no surprise that a diagnosis of depression is overlooked and goes undetected by healthcare professionals<sup>29</sup>.

The absence of an affective component (i.e. low mood) can lead to healthcare professionals disregarding the potential for the presence of depression and consequently not exploring for other symptoms.

Furthermore, symptoms of depression, especially somatic ones, are often attributed to physical illnesses. Depressive somatic symptoms often lead to a diagnosis of depression being overlooked; such symptoms 'mask' the clinical diagnosis of depression and hence the term 'masked depression'<sup>30</sup>. Depressive somatic symptoms – e.g. low energy levels, insomnia, poor appetite and weight loss – are often attributed to physical illness and/or frailty by both the individual and healthcare professional<sup>7-8, 31</sup>.

Further complicating diagnostic difficulties and under-recognition is the fact that older adults are less likely to report any symptoms associated with mental health problems and ask for help in the first place<sup>7,10,32</sup>; explanations for this include older adults being less emotionally open, having a sense of being

a burden or nuisance, and believing symptoms are a normal part of ageing or secondary to physical illness<sup>7,10,29,33</sup>. Older adults also have a reluctance to report mental health problems due to their perception of associated stigma; many older adults hold the view the mental health problems are shameful, represents personal failure and leads to a loss of autonomy<sup>7</sup>.

There is an overlap between symptoms of depression and symptoms of dementia. It is quite common for older adults with dementia to initially present with depressive symptoms. Depression has a high incidence in those with dementia, especially those with vascular dementia. Depression is particularly difficult to diagnose in dementia due to communication difficulties; diagnosis is often based on observed behaviours<sup>8,33</sup>.

### Depression and comorbidity in older adults

In those with pre-existing physical health problems, depression is associated with deterioration, impaired recovery and overall worse outcomes<sup>34</sup>. For example, the relative risk of increased morbidity related to coronary heart disease is 3.3 in comparison to individuals without depression<sup>35</sup>. Mykletun et al. established that a diagnosis of depression in older adults increased mortality by 70%<sup>36</sup>. Several causative routes account for poor physical illness outcomes. Older adults with depression are less likely to report worsening health. Depressive symptomatology indirectly affects physical illness through reduced motivation (often secondary to feelings of helplessness and hopelessness) and engagement with management. Poor compliance with management advice, notably adherence to medications is observed<sup>37</sup>. Feelings of hopelessness, helplessness and negativity will contribute to the failure to seek medical attention in the first place or report worsening health when seen by a healthcare professional.

Depression affects biological pathways directly, which impairs physical recovery. Such biological effects include pro-inflammatory factors, metabolic factors, impact upon the hypothalamic-pituitary axis and autonomic nervous system changes<sup>38</sup>.

Older adults who are depressed are more likely to have existing physical health conditions and more likely to develop physical health conditions<sup>15</sup>. Depression is particularly associated with specific physical illnesses; cardiovascular disease and diabetes mellitus. A study by Win *et al.* found that cardiovascular mortality is higher in older adults with depression because of physical inactivity; the study established that physical inactivity was accountable for a 25% increased risk in cardiovascular disease<sup>39</sup>. The relationships between depression and cardiovascular disease and depression and diabetes have been described as “bidirectional”<sup>38</sup>.

Higher incidents of cardiovascular disease and diabetes mellitus are seen in people with depression regardless of age. A study by Brown et al. found that older adults with depression had a 1.46 relative risk increase for developing coronary heart disease

compared to those without depression<sup>40</sup>. The hypothalamic-pituitary axis dysfunction found in depression leads to increased levels of cortisol, which in turn, increases visceral fat. Increased visceral fat is associated with increased insulin resistance, promoting diabetes mellitus, and increased cardiovascular pathology<sup>38</sup>.

Depression is a risk factor for the subsequent development of dementia; this is especially so if an older adult has no previous history of depression (i.e. depression is late-onset)<sup>13</sup>.

### Healthcare utilisation and economic impacts

Older adults are less likely to report depressive symptoms to healthcare professionals explaining the under-utilisation of mental health services for depression<sup>32,41</sup>. Despite older adults under-utilising mental health services they over utilise other healthcare services<sup>26,41</sup>. For example, those presenting with non-specific medical complaints or somatisation have been found to have an increase use of healthcare services. Non-specific medical complaints and somatisation lead to an unnecessary use of resources, such as unnecessary consultations with healthcare professionals and investigations<sup>41</sup>. Increase in service utilisation means an increase in the associated economic cost of depression in older adults<sup>41-43</sup>.

Healthcare costs of older adults with a comorbid physical illness and depression are far greater than those without depression – findings in diabetes mellitus are a good example<sup>43</sup>. The majority of the increased healthcare costs are associated with the chronic physical disease and not the care and treatment of the depression<sup>44</sup>. Poor compliance with physical illness management is associated with missed appointments and a greater number of hospital admissions, which both have financial implications.

### Aetiology and associations of depression in older adults

Late-onset type depression in older adults has been associated with the term ‘vascular depression’<sup>45-47</sup>. Studies have found a significant higher rate and severity of white matter hyperintensities on MRI imaging in older adults with depression compared to those without depression<sup>46,48,50</sup>. White matter hyperintensities represent damage to the nerve cells; such damage is a result of hypo-perfusion of the cells secondary to small blood vessel damage<sup>49</sup>. White hyperintensities are associated with vascular risk factors (e.g. age, hypertension, hypercholesterolemia, obesity, diabetes mellitus, smoking) and are linked to cerebrovascular disease, such as stroke, vascular dementia. A relationship has been found between psychosocial stress and consequent development of vascular risk factors, which further supports the hypothesis of ‘vascular depression’<sup>46</sup>. Clinically, ‘depression-executive dysfunction syndrome’ and psychomotor retardation are associated with vascular changes<sup>48</sup>.

In older adults with depression, white matter hyperintensities are associated with structural changes to corticostriatal circuits and subsequent executive functional deficits. Loss of motivation or interest and cognitive impairment in depression are hallmark

features of structural brain changes associated with the frontal lobes, which in turn are associated with a vascular pathology<sup>20</sup>. A study by Hickie et al. established that white matter hyperintensities in older adults with depression are associated with greater neurological impairment and poorer response to antidepressant treatment<sup>50</sup>. It is not fully understood why vascular depression responds less well to antidepressants; poor response has been linked directly to vascular factors but has also been associated with deficits in executive function<sup>46-47</sup>.

The relationship between cerebrovascular disease and depression is described as 'bi-directional'<sup>45,51</sup>; depression has been found to cause cardiovascular disease and vice versa<sup>51</sup>. Baldwin et al. direct the reader to the presence of post-stroke depression and the occurrence of depression in vascular dementia<sup>45</sup>.

Younger and older adults share a number of fundamental risk factors for depression; such as female gender, personal history and family history<sup>7</sup>. Older adults have additional risk factors related to ageing, which are not just physiological in nature.

#### *Age related changes:*

Age related changes occurring in the endocrine, cardiovascular, neurological, inflammatory and immune systems have been directly linked to depression in older adults<sup>3</sup>.

The normal ageing process sees changes to sleep architecture and circadian rhythms with resultant changes to sleep patterns<sup>52</sup>. Thus sleep disturbances are common in older adults and positively correlated to advancing age<sup>52</sup>; over a quarter of adults over the age of 80 years report insomnia, and research has well-established that this is a risk factor for depression<sup>53-54</sup>. A meta-analysis by Cole *et al.* found sleep disturbances to be a significant risk factor for the development of depression in older adults<sup>53</sup>.

#### *Sensory impairment:*

Sensory impairments, whether secondary to the ageing or a disease process, are risk factors<sup>53,55</sup>. Research has found that hearing and vision impairments are linked to depression<sup>56</sup>. A sensory impairment can lead to social isolation and withdrawal, which, in turn, are further risk factors for depression.

#### *Physical illness:*

Physical illness, regardless of age, is a risk factor for depression. Older adults are more likely to have physical illnesses and so in turn are more at risk of depression. See Table 2. Physical illness is associated with sensory impairments, reduced mobility, impairment in activities of daily living and impaired social function, all of which can lead to depression. Physical illnesses associated with chronicity, pain and disability pose the greatest risk for the subsequent development of depression<sup>7,53,55</sup>. Physical illness affecting particular systems of the body, such as the cardiovascular, cerebrovascular and neurological, are more likely to cause depression<sup>3</sup>. Essentially, however, any serious or chronic illness can lead to the development of depression. It

should be noted that a large proportion of older adults have physical illness but do not experience depression symptoms, therefore other factors must be at play<sup>5,57</sup>.

Treatments of physical illness are directly linked to aetiology in depression, for example, certain medications are known to cause depression; cardiovascular drugs (e.g. Propranolol, thiazide diuretics), anti-Parkinson drugs (e.g. levodopa), anti-inflammatories (e.g. NSAIDs), antibiotics (e.g. Penicillin, Nitrofurantoin), stimulants (e.g. caffeine, cocaine, amphetamines), antipsychotics (e.g. Haloperidol), anti-anxiolytics (e.g. benzodiazepines), hormones (e.g. corticosteroids), and anticonvulsants (e.g. Phenytoin, Carbamazepine)<sup>7,29</sup>. Polypharmacy is present in many older adults further increasing the risk of depression. Pharmacokinetic and pharmacodynamic age related changes also contribute to an increased risk of medication induced depression in older adults.

**Table 2: Table of physical illnesses associated with depression<sup>3,7</sup>**

Cardiovascular	Endocrine	Cerebrovascular/neurological
Ischaemic heart disease	Addison's disease	Cerebral arteriosclerosis
Myocardial infarction	Cushing's disease	Cerebral infarction
	Hypothyroidism	Intracranial tumour
	Hyperthyroidism	Parkinson's disease
	Diabetes mellitus	Multiple sclerosis
	Hypoglycaemia	Temporal lobe epilepsy
<b>Metabolic</b>	<b>Autoimmune disorders</b>	Dementia
Electrolyte abnormalities	Rheumatoid arthritis	
• Hyponatraemia	Systemic lupus erythematosus	
• Hypercalcaemia	Pernicious anaemia	
• Hyperkalaemia		
• Hypokalaemia		
Folate deficiency		
Thiamine deficiency		

#### *Dementia:*

Dementia is common in old age and those with dementia are at higher risk of developing depression compared to those who do not have it<sup>58</sup>. 20-30% of older adults with Alzheimer's disease have depression<sup>59</sup>. Depression is a risk factor for the subsequent onset of dementia.

#### *Psychosocial:*

When compared to younger adults, older adults are at a greater risk of developing depression due to the increased likelihood of experiencing particular psychosocial stressors, in particular adverse life events. Stressors include lack of social support, social isolation, loneliness and financial hardship. Financial hardship and functional impairment often sees older adults downsizing in property. Deteriorating physical health often sees older adults no longer being able to manage living independently at home necessitating a move into institutional living. Bereavement, especially spousal, and the associated role change that follows this are risk factors for depression<sup>3</sup>.

#### *Sub-threshold depression:*

Sub-threshold depression is an established risk factor for major depression.

### Prevalence and epidemiology

The prevalence of depression in older adults in England and Wales was found to be 8.7% in 2007; however, if those with dementia are included this figure rises to 9.7%<sup>60</sup>. A meta-analysis by Luppá et al. established a 7.2% point prevalence of major depression and a 17.1% point prevalence of depressive disorder in older adults<sup>61</sup>. The projected lifetime risk of an older adult developing major depression by the age of 75 years old is 23%<sup>62</sup>.

Sub-threshold depression is 2-3 times more prevalent than major depression in older adults<sup>26,63</sup>. These depressive symptoms are often clinically relevant<sup>26,29</sup>. 8-10% of older adults per year with sub-threshold depressive symptoms go onto develop a major depressive episode<sup>63</sup>.

Incidence and prevalence are greater in women; 10.4% of women over the age of 65 years have depression compared to 6.5% of men<sup>60</sup>. Older women are more likely to experience recurrent episodes of depression compared to older men<sup>62</sup>. The gender gap in incidence and prevalence becomes narrower with increasing age<sup>3</sup>. It should be acknowledged however that women are more likely to present to healthcare services and seek help in comparison to men<sup>64-65</sup>.

The prevalence of major depression in older adults varies by setting<sup>66</sup>. Highest rates are seen in long-term institutional care and inpatient hospital settings<sup>67</sup>. Table 3 summaries prevalence rates of major depression by setting.

**Table 3: Prevalence rate of major depression by setting**<sup>7, 67</sup>

Setting	Prevalence rate (%)
Community	5 – 10
Primary care	10 – 30
Hospital inpatient	11 – 50
Long-term institutional care	10 – 43

### Prognosis of depression in older adults

Depression in older adults is associated with a slower rate of recovery<sup>9</sup>, worse clinical outcomes compared to younger adults<sup>3</sup> and is associated with higher relapse rates<sup>68</sup>. Worse prognosis in older adults correlates with advancing age, physical comorbidities and functional impairment<sup>70</sup>. The structural brain changes associated with depression in older adults are linked, as discussed, to poorer treatment response.

Morbidity and mortality associated with depression can be described as primary or secondary; primary morbidity and mortality arises directly from the depressive illness; whereas secondary morbidity and mortality arises from physical health problems, which are secondary to depression.

Outcomes from sub-threshold depression are on par with those of major depression; however sub-threshold depression which develops into major depression is associated with worse outcomes<sup>2</sup>.

Proportionally more people over the age of 65 years commit suicide compared to younger people<sup>71</sup>. Depression is the leading cause of suicide in older adults<sup>29,71</sup>; one study reports that 75% of older adults who killed themselves were depressed<sup>72</sup>.

The vast majority of older adults who commit suicide have had contact with a health professional within the preceding month<sup>9</sup>; this figure has been quoted as high as 70%<sup>3</sup>. This further supports and suggests the fact the depression is under-detected. Unlike younger adults, older adults are less likely to report suicidal ideation and can experience suicidal ideation without feeling low in mood<sup>3,7</sup>. Older adults have few suicide attempts, compared to younger adults, because their suicide methods are more lethal<sup>13</sup>.

### Acknowledgements

None

### Competing Interests

None declared

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