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REVIEW ARTICLE

How well do older adults recognise mental illness? A literature review

Gali MALKIN [1], **Tsahi HAYAT,**[2] **Yair AMICHAI-HAMBURGER,**[2] **Boaz M. BEN-DAVID,**[1] **Tali REGEV**[3] **and Ora NAKASH**[1]

[1]Baruch Ivcher School of Psychology, [2]Sammy Ofer School of Communications and [3]School of Economics, Interdisciplinary Center (IDC) Herzliya, Herzliya, Israel

Correspondence: Professor Ora Nakash PhD, School of Psychology, Interdisciplinary Center I(DC), Herzliya PO Box 167, 46150 Herzliya, Israel. Email: onakash@idc.ac.il

Abstract

Older adults tend to underutilise mental health services. Mental health literacy plays a critical role in identifying and overcoming barriers to accessing mental health care. The ability to recognise mental illness is an essential component of mental health literacy, with important implications to whether the person will seek professional help. We conducted a review of the literature on older adults' abilities to recognise mental illness. Of the 421 papers that were retrieved in the comprehensive search in PubMed, 32 studies met inclusion criteria. Studies were heterogeneous in terms of target population and methodology, yet findings show that older adults are less likely to correctly recognise mental disorders. Cueing older participants with mental labels improved their recognition abilities. Recognition was particularly poor among immigrant and ethnic/racial older adults, likely due to linguistic and cultural barriers. Our findings demonstrate that older adults show low levels of mental illness recognition and tend to view some illnesses as normal parts of aging. Findings emphasise the need for developing educational programs tailored by the specific phenomenology, conceptualisations and cultural meanings of mental illness among older adults, with attention to informal sources of information and social networks.

INTRODUCTION

Populations are aging rapidly worldwide. According to European Union estimates, the proportion of the European population above the age of 60 will rise from 22% in 2000 to 30% in 2025 and 34% in 2050.[1] Older adults have high needs for mental health services.[2] Yet, underutilisation of mental health services has been documented, with approximately 50–70% of older adults needing mental health services not seeking it.[3,4] Without appropriate mental health intervention, older adults may face adverse consequences including impaired quality of life, increased mortality, and poor health outcomes.[5]

Of particular relevance to identifying barriers to accessing mental health care is the concept of mental health literacy (MHL). MHL is defined as both knowledge and attitudes regarding mental health that aid in recognition, management and prevention of mental health issues.[6,7] Accumulating evidence shows that MHL is critical to mental health promotion.[7] High MHL allows consumers to be included as full participants in knowledge-based decision-making.[8]

MHL includes five domains: (i) the ability to recognise specific disorders; (ii) knowing how to seek mental health information; (iii) knowledge of risk factors and causes of self-treatments; (iv) knowledge of professional help available; and (v) attitudes that promote recognition and appropriate help seeking.[6]

Studies documented lower levels of MHL in older adults compared to their younger counterparts.[9–12] Older adults are less able to correctly recognise and label mental disorders, have poorer knowledge of mental health issues, and hold negative attitudes toward mental health treatment. Some of the reasons for older adults' poorer MHL include subjective

factors such as stigma[5,13] and a lack of perceived need.[14] Objective barriers such as lack of accessibility and availability of services, and low rates of referrals by general practitioners were also documented.[2]

Of MHL domains, the difficulty to recognise mental disorders plays a key role in surmounting the barriers to help-seeking across the life span.[15] For example, in a study by Wright and colleagues,[16] young people who recognised either depression or psychosis in a case-vignette tended to have more positive help-seeking attitudes and more appropriate treatment choices. In a literature review of clinical and community-based research on depression, Gabriel and Violato[17] concluded that recognising a mental health problem is closely related to knowledge of depression, as well as attitudes toward depression and preferred treatment.

Despite the significance of consumers' self-recognition of mental illness to mental health management and outcomes, fewer studies looked at older adults' abilities to recognise mental illness. The studies that do exist offer a wide array of definitions and methodologies. Here, we conduct a comprehensive review of the literature on the ability to detect and recognise mental disorders among older adults. We defined mental illness recognition as the person's ability to identify and recognise mental illness, or their knowledge of mental illness recognition.

METHODS
Search methodology
We conducted a comprehensive literature search using the online database PubMed[18] for articles published between 1980 and 2016. By carefully examining the reference lists of the included articles, we were certain that we were less likely to miss studies that may not have been originally located. The following combinations of keywords were used: mental health, literacy, recognition, depression, older adults.

Study selection
We identified 421 papers and screened for the following inclusion criteria: (i) participants' mean age was 60 years and above; (ii) studies were empirical in design (qualitative and quantitative) and included an investigation of the ability to recognise mental health disorders; and (iii) published in English. Unpublished manuscripts (e.g., abstracts, dissertations), as well as non-peer-reviewed work (e.g., books, and book chapters) were excluded. Figure 1 presents the flow chart for the selection of studies that were included in the review.

Of the 421 papers located, 380 papers remained after the removal of duplicates. Since many of the studies did not address mental health issues nor focused on mental illness recognition, an initial screen was performed based on the studies' titles and abstracts and studies that were not relevant to mental health literacy at older age were excluded. This resulted in 71 potential studies, which were included for review based on their abstracts. An additional 109 studies were located through hand-searching the selected articles' reference lists. Each of the 180 located articles was examined based on the following exclusion criteria:

1 study was a review or a theoretical article.
2 study did not target older adults, that is, investigated the general population or focused on participants not meeting the age criteria. Studies in which participants' ages were not reported were further excluded.
3 study was conducted *solely* among healthcare professionals (e.g., nurses, general practitioners, family doctors etc.) or informal sources of support (e.g., clergy).
4 study did not address the recognition aspect of MHL, such that participants were not explicitly asked to detect mental disorder/s, to recognise symptoms' meanings, or to discuss knowledge of mental illness recognition.
5 article could not be retrieved.

This process resulted in 61 articles retained for full text review. During the full text review a further 29 papers were excluded as they did not meet the inclusion criteria (Fig. 1). Our review is therefore based on 32 studies.

RESULTS
Characteristics of the included studies
Key characteristics of the 32 studies that were included in the review are listed in Table 1. A majority of studies were conducted in the USA (*n* = 16) and UK (*n* = 6). Sample size ranged from a minimum of 15 to a maximum of 6141 participants. Half of the studies (*n* = 16) addressed ethnic minority groups of older adults, including African-Americans, Asians and Latinos in the USA, Chinese living in Canada, and
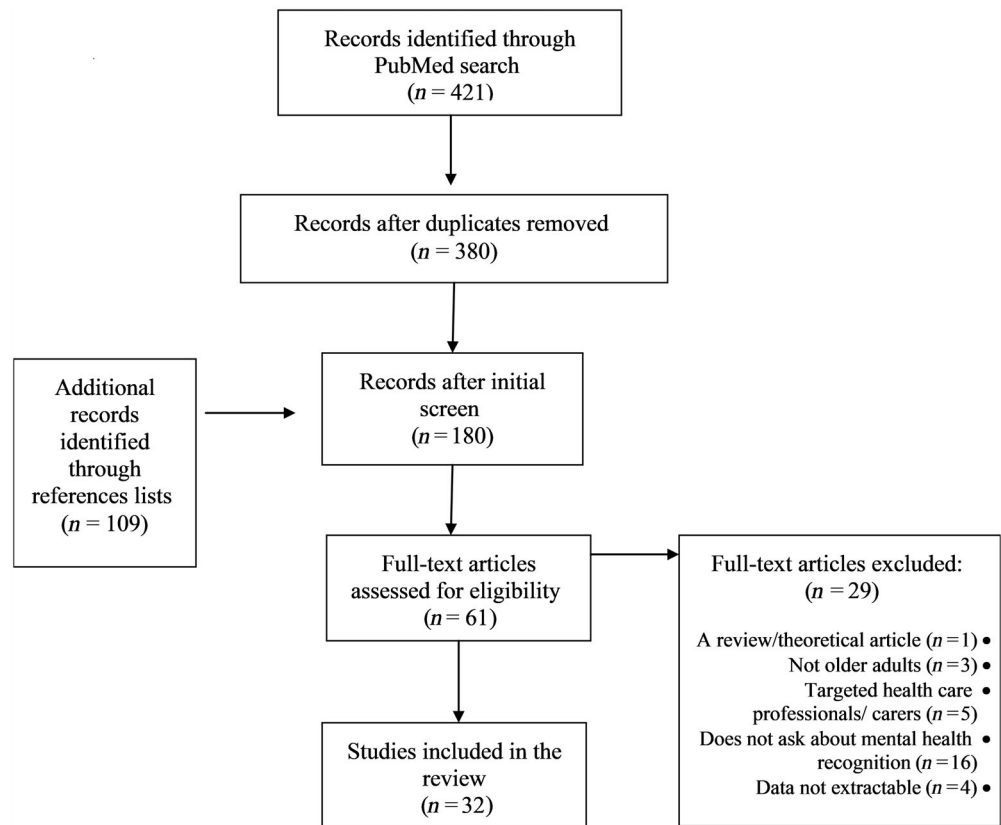
Figure 1 Study selection flow diagram.

Indians, Asians and Afro-Caribbeans residing in the UK. Seven studies examined age differences by comparing older and younger adults. The majority of studies were conducted using quantitative methods, that is, surveys (n = 21), with the remainder using qualitative methods (interviews n = 6; focus groups n = 4) or mixed methods (n = 1).

Type of mental illness and stimulus characteristics

Depression (n = 15) and dementia/Alzheimer's disease (n = 11) were most frequently examined. Two studies examined mental disorders in general. In addition, there were single papers examining the following combinations: depression and schizophrenia, depression and anxiety, depression and dementia, and depression and psychosis (Table 1).

Vignettes were commonly used (n = 14) to assess recognition of mental disorders that portrayed a person at the threshold of a mental disorder, describing classical features of the mental disorder. Three studies involved a younger protagonist in the vignettes, and five studies described an older protagonist. Two

studies involved two versions of the vignettes: one with a 30-year-old protagonist and the other with a 70-year-old protagonist. The remaining four studies that used vignettes either deliberately excluded the protagonist's age or did not provide information regarding this characteristic.

Other commonly used measures involved knowledge questionnaires (n = 9). These questionnaires are global measures of knowledge on either late life depression or dementia/Alzheimer's disease, covering various aspects such as the disorder's nature, symptoms, course, aetiology, diagnosis, and treatment. Additionally, two studies used symptoms classification tasks in which participants were presented with a list of symptoms and asked whether each symptom represented the targeted mental disorder. One study employed a scale assessing barriers to mental health services.

Analysis of quantitative studies
Older adults' recognition of mental disorders
Participants' abilities to recognise a mental health problem varied between studies based on

Table 1 Overview of the included studies

Author (year)	Country	Target population/s	Sample size	Participant ages (mean or range)	Methodology	Data collecting method	Stimulus	Type of mental disorder	Other literacy aspects addressed
Ayalon and Areán (2004)[19]	USA	Anglo, Latino, Asian, and African-American older adults	96 (Anglo) 37 (Latino) 30 (Asian) 30 (African-American)	65–71 years across all groups	Quantitative	Survey	Knowledge questionnaire	Alzheimer	Yes (knowledge of other aspects)
Black et al. (2007)[20]	USA	Older African-American women	20	80 years and above	Qualitative	Interview		Depression	Yes
Braun et al. (1996)[21]	USA	Vietnamese immigrants	A total of 4 groups. Of which, one older adults group included 10 participants	65.2 (older adults group) Other participant groups with mean ages of 24, 54, 56 years	Qualitative	Focus groups		Dementia	Yes
Conner, Copeland et al. (2010)[5]	USA	African-American older adults suffering from depression	37	72 years	Qualitative	Interview		Depression	Yes
Conner, Lee et al. (2010)[22]	USA	African-American older adults suffering from depression	42	65 years	Qualitative	Focus groups		Depression	Yes
Connery and Davidson (2006)[10]	UK	Older and younger adults	132 (older) 190 (younger)	65 years and above (older) 18–64 (younger)	Quantitative	Survey	Vignette	Depression	Yes
Corner and Bond (2004)[23]	UK	Older adults	15	60 years and above	Qualitative	Interview		Dementia	Yes
Davidson and Connery (2003)[24]	UK	Older and younger adults	147 (older) 122 (younger)	65 years and above (older) 18–64 (younger)	Quantitative	Survey	Vignette	Depression	Yes
Farrer et al. (2008)[11]	Australia	Adults (18+ years)	1998 of which 428 aged 55–69 and 287 aged 70+	Five age groups: 18–24 years 25–39 years 40–54 years 55–69 years 70 years and above	Quantitative	Survey	Vignette	Depression Schizophrenia	Yes
Fisher and Goldney (2003)[9]	Australia	Older and younger adults	300 (older) 521 (younger)	65–74 years (older) 15–24 years (younger)	Quantitative	Survey	Vignette	Depression	Yes
Gitlin et al. (2012)[25]	USA	African-American older adults	153	73 years	Quantitative	Survey	Vignette	Depression	Yes
Gum et al. (2010)[26]	USA	Older adults	244	77.8 years	Quantitative	Survey	Vignette	Depression with sadness Depression without sadness	Yes

Table 1 Continued

Author (year)	Country	Target population/s	Sample size	Participant ages (mean or range)	Methodology	Data collecting method	Stimulus	Type of mental disorder	Other literacy aspects addressed
Jang et al. (2010a)[27]	USA	Older Korean-Americans	675	70.2 years	Quantitative	Survey	Knowledge questionnaire	Depression	Yes (knowledge of other aspects)
Jang et al. (2010b)[28]	USA	Older Korean-Americans	675	70.2 years	Quantitative	Survey	Knowledge questionnaire	Alzheimer	Yes (knowledge of other aspects)
Lasoski and Thelen (1987)[29]	USA	Older and middle-aged adults	100 (older) 100 (middle-aged)	70.5 years (older) 45.7 years (middle-aged)	Quantitative	Survey	Vignette	Various syndromes	Yes
Lawrence et al. (2006)[30]	UK	Depressed and non-depressed Black Caribbean, South Asian, and White British older adults	32 (Caribbean) 33 (Asian) 45 (European)	74 years (Caribbean) 71 years (Asian) 76 years (European)	Qualitative	Interview	Vignette	Depression	Yes
Lee et al. (2009)[31] Lee et al. (2016)[32]	Hong Kong Korea	Stroke survivors Older adults	214 6141	72.3 years 65 years and above	Qualitative Quantitative	Interview Survey	Knowledge questionnaire	Depression Dementia	No Yes (knowledge of other aspects)
Lee et al. (2010)[33]	USA	Korean-Americans	209	59.5 years	Quantitative	Survey	Knowledge questionnaire	Alzheimer	Yes (knowledge of other aspects)
Loi and Lautenschlager (2015)[34]	Australia	Older adults	56	64 years	Quantitative	Survey	Vignette	Dementia	Yes
Marwaha, and Livingston (2002)[35]	UK	Depressed and non-depressed British and Afro-Caribbean older adults	40	67–93 years	Qualitative	Interview	Vignette	Depression Psychosis	Yes
Patel and Prince (2001)[36]	India	Older adults and key informants including service providers and family care givers	A total of 13 groups. Of which, five older adult groups including 37 participants.	Four older adults groups aged 60–89 years. One older adults group aged 50–70 years.	Qualitative	Focus groups	Vignette	Depression Early dementia Established dementia	Yes
Pepin et al. (2010)[37]	USA	Older and younger adults	88 (older) 76 (younger)	74.8 years (older) 23 years (younger)	Quantitative	Survey	Barriers to Mental Health Services Scale (BMHSS)	Depression	Yes
Price et al. (1986)[38]	USA	Older adults	148	71 years	Quantitative	Survey	Knowledge questionnaire	Alzheimer	Yes (knowledge of other aspects)
Purandare et al. (2007)[39]	UK	Indian and Caucasian older adults	191(Indians) 55 (Caucasians)	72.4 years (Indians) 78.1 years (Caucasians)	Quantitative	Survey	Knowledge questionnaire	Dementia	Yes (knowledge

Table 1 Continued

Author (year)	Country	Target population/s	Sample size	Participant ages (mean or range)	Methodology	Data collecting method	Stimulus	Type of mental disorder	Other literacy aspects addressed
Roh et al. (2015)[40]	USA	American Indian older adults	227	60.7 years	Quantitative	Survey	Knowledge questionnaire	Depression	Yes (of other aspects)
Sadavoy et al. (2004)[41]	Canada	Chinese & Tamil Canadian older adults, families and service providers	A total of 17 groups. Of which, five older adult groups including 10–18 participants each.	65 years and above (Chinese) 55 and above (Tamil)	Qualitative	Focus groups	Vignette	Various syndromes	Yes
Sadule-Rios et al. (2014)[42]	USA	Hispanics older adults	50	64.26 years	Mixed methods	Survey, interview	Vignette	Depression	Yes
Tieu et al. (2010)[43]	Canada	Older Chinese immigrants and older Canadian-born	54 (Chinese) 731 (Canadian-born)	69.8 years (Chinese) 62.6 years (Canadian-born)	Quantitative	Survey	Vignette	Depression	Yes
Werner (2002)[44]	Israel	Older adults	186	64.1 years	Quantitative	Survey	Knowledge questionnaire	Alzheimer	Yes (knowledge of other aspects)
Werner (2003)[45]	Israel	Community-dwelling adults aged 45 and over	150	60 years	Quantitative	Survey	A list of Alzheimer symptoms	Alzheimer	Yes
Wetherell et al. (2009)[12]	USA	Adults (18+ years)	149 (older) 225 (younger)	65 years and above (older) Less than 65 (younger)	Quantitative	Survey	A list of anxiety and depression symptoms	Depression Anxiety	No

Table 2 A summary of studies using case-vignettes to assess recognition of mental illness

Authors	Vignette type	Question format	Older adults' recognition of mental illness
Connery and Davidson (2006)[10]	A 30/70-year-old person with depressive symptoms.	A 5-point Likert scale (ranging from 'very much' to 'not at all') to determine agreement with the following statement: 'the person in the story might be suffering from a mental illness'	Older participants' recognition factor mean score: 3.83 (SD = 0.99)[†].
Davidson and Connery (2003)[24]	A 30/70-year-old person with depressive symptoms.	A 5-point Likert scale (ranging from 'very much' to 'not at all') to determine agreement with the following statement: 'the person in the story might be suffering from a mental illness'	Older participants' recognition item mean scores: 3.47 (SD = 1.52) for an older protagonist 3.63 (SD = 1.17) for a younger protagonist.
Farrer et al. (2008)[11]	Younger person with depressive/ schizophrenia symptoms.	What would you say is wrong, if anything, with the person in the story?	41.5% of participants aged 70 and above identified depression. 24.1% identified schizophrenia.
Fisher and Goldney (2003)[9]	Younger person with depressive symptoms.	What would you say is wrong, if anything, with the person in the story?	39.0% of older participants identified depression.
Gitlin et al. (2012)[25]	A depression vignette with no age reference.	Would you describe yourself as depressed if you hypothetically felt like the person in the vignette (yes/no).	88.2% of participants (older African-American) identified depression.
Gum et al. (2010)[26]	Older person with depressive symptoms: one vignette described depression with sadness and the other vignette included anhedonia instead of sadness.	*Identification of depression*: 'what would you say is wrong, if anything, with the person in the story?' *Recognition of depression*: respond to the same question above, using a checklist including 10 potential problems.	41% of participants identified depression 57.6% of participants recognised depression from a checklist.
Lasoski and Thelen (1987)[29]	Six vignettes describing individuals with mental health problems. No age reference.	A 6-point Likert scale to determine agreement or disagreement with whether the person has a serious psychological problem.	Older participants' overall agreement scores: 4.3–4.4.
Loi and Lautenschlager (2015)[34]	Older person with dementia symptoms.	N/A	80% of participants identified dementia.
Tieu et al. (2010)[43]	Younger person with depressive symptoms.	1 Do you personally think he/she has a problem? If so, what kind of problem does he/she have? 2 Do you personally think he/she has any psychological disorders and, if so, what type does he/she have? (used only for Chinese participants)	*Older Chinese sample*: 11.3% of participants identified depression in the first question. 20.8% of participants identified depression in the second question. *Older Canadian-born sample*: 74.0% identified depression.

[†] This is an aggregated score including the single recognition item and three additional items (e.g. 'the person would benefit from talking to his/her own doctor') named by the authors as the 'recognition of symptoms of depression as a sign of mental illness factor. Older adult single recognition item scores are not reported.

characteristics such as participants' age group, ethnic identity, type of mental problem investigated and type of recognition measure employed.

Results from studies employing a vignette methodology (*n* = 9) are summarised in Table 2. Studies using an open-ended question: 'What would you say is wrong, if anything, with the person in the story?', reported that less than 50% of the older participants were able to correctly identify depression.[9,11,26] However, when participants were cued to think about

certain mental disorders – for example by asking them to recognise a mental disorder using a checklist of potential disorders, older adults' recognition of mental health problems improved.[26] In one study, older adults were asked if they would describe themselves as depressed if they hypothetically felt like the person in the vignette. Eighty-eight percent of participants correctly identified the person in the vignette as depressed.[25] Furthermore, when participants were generally asked whether the protagonist might be suffering from a mental illness (without specifying which mental disorder), their overall agreement score with this statement was rather fair.[10,24,29] Of all nine studies in this category, only one quantitative vignette study focused on dementia literacy and described recognition rates of 80% among older adults.[34]

Studies using mental health knowledge questionnaires differentiated between knowledge of various topics, such as treatment (e.g., 'Alzheimer's disease is not curable'),[38] aetiology (e.g., 'Offspring whose parents had dementia will also have dementia'),[32] basic knowledge (e.g., 'Which part of body is affected? (i) lungs; (ii) brain; (iii) heart; and (iv) do not know'),[39] and symptoms (e.g., 'A person who remembers things that happened in the past does not have dementia').[32] Since the current review focuses solely on the MHL recognition aspect, we searched each of the articles in this category for knowledge items addressing the ability to recognise mental illness, namely, knowledge of symptoms/diagnosis. Table 3 describes in detail the relevant knowledge items identified, with percentages of incorrect responses.

Of the nine studies employing symptoms knowledge questionnaires, six studies documented an incorrect response rate of 50% and above in more than half of the symptoms knowledge items. Two of these studies addressed late life depression, and the remainder focused on Alzheimer/dementia. Overall, with regard to late life depression, the most consistent (incorrect) responses were documented for the following item: 'Older people are more likely than younger people to say, I am depressed'. For Alzheimer/dementia symptoms knowledge, older respondents generally recognised that memory loss is a significant indicator of Alzheimer/dementia. However, they were less knowledgeable about the fact that memory loss is caused by a disease, and is not a common problem among older adults.

In another quantitative study[45] participants were asked to rate 15 Alzheimer and non-Alzheimer symptoms on a five-point Likert-type scale. Most Alzheimer symptoms were correctly identified by more than 50% of the participants in this study, confirming that cueing older participants with mental labels may be associated with improved recognition outcomes.

Age differences in recognition of mental disorders

Of the seven studies comparing older and younger adults, four studies reported that older adults are less accurate than younger adults in terms of mental illness recognition (focusing on depression). For example, Fisher and Goldney[9] reported that 50.9% of younger participants correctly detected the presence of depression, compared to 39% of older participants. Farrer *et al.*[11] reported that 71.7% of the youngest age group (aged 18–24) correctly recognised depression, while in the oldest age group (70 years and above) recognition rates for depression were 41.5%. Age differences were also reported for schizophrenia in this study, with adults in the oldest age less able to correctly recognise schizophrenia than adults aged 40–54 years (24.1% vs. 46.9%, respectively). In another study, participants under 65 years were more likely to recognise symptoms of depression as indicative of a mental illness, than people over 65 years.[10] In the study of Wetherell *et al.,*[12] older participants classified fewer anxiety and depressive symptoms correctly than younger participants.

Finally, one study employed the barriers to mental health services scale.[37] One of the items in this scale addressed the belief that depressive symptoms are normal. Older adults (aged 75–90) perceived this belief to be a greater barrier to seeking mental health services than young-old participants (aged 61–74), although no differences were found for this item between younger (18–35 years) and older (61–95 years) adults.

Cross-cultural comparisons

Cultural factors also play an important role in mental health recognition among older adults. Overall, members of immigrant and ethnic minority groups generally fared worse in recognising mental health issues compared to members of the dominant ethnic/racial

Table 3 Description of knowledge items used to assess mental illness recognition

Authors	Type of measure	A description of relevant recognition items	Older adults incorrect answers (%)
Ayalon and Areán (2004)[19]	Knowledge of Alzheimer disease (AD) items.	AD is a form of insanity (F).	9.4–64.9%[†]
		Persons with AD develop physical and mental problems (T).	21.9–40.5%[†]
		The major symptom of AD is memory loss (T).	9.4–40.5%[†]
		In people over 75 years of age, forgetfulness is indicative of the beginning of AD (F).	**26.1–86.7%**
		When a spouse of someone elderly dies, the survivor can suffer a type of depression that appears as if it were AD (T).	**40–67.6%**[†]
		Stuttering is an inevitable part of AD (F).	**37.5–94.6%**[†]
		AD can be diagnosed with a blood test (F).	**55.3–94.6%**
Jang et al. (2010a)[27]	The depression in late life quiz.[46]	It is normal for older people to feel depressed a good part of the time (F).	**52.7%**
		Memory problems may be a sign of depression (T).	**50%**
		Depression is easy to recognise in an older person who is physically ill (F).	**74%**
		Older people are more likely than younger people to say, 'I am depressed' (F).	**60.8%**
		It is common for older people to talk about potential suicide (F).	17.4%
		Health professionals often have difficulty diagnosing depression in the older person (T).	**50%**
Jang et al. (2010b)[28]	Knowledge of AD items.	AD is a form of insanity (F).	42%
		The major symptom of AD is memory loss (T).	13.6%
		Symptoms of depression are similar to those of AD (T).	42.3%
		AD can be diagnosed with a blood test (F).	19.2%
Lee et al., (2010)[33]	Alzheimer's disease awareness test (ADAT).[47]	The primary symptom of AD is memory loss (T).	10.6%
		A person who has AD will experience both mental and physical decline (T).	25.1%
		Among persons over age 75, forgetfulness most likely indicates beginning of AD (F).	**70.2%**
		AD is a form of insanity (F).	**74.3%**
		When husband or wife of an older person dies, surviving spouse may suffer from a depression that looks like AD (T).	40.3%
		Stuttering is an inevitable part of AD (F).	**50.7%**
		AD can be diagnosed by a blood test. (F).	**63.6%**
Lee et al. (2016)[32]	Knowledge-of-dementia items.	A person who remembers things that happened in the past does not have dementia (F).	**73.2%**
		Dementia is diagnosed by means of a blood test (F).	47.1%
		Dementia is frequently accompanied by depression (T).	14.6%
		Personality can be changed when a person has dementia (T).	7.9%
Price et al. (1986)[38]	Knowledge of AD items.	Progressive withdrawal from social activities is common to all people with AD (T).	45%
		Fatigue is a common problem for people with AD (T).	**78%**
		People with AD can no longer learn new skills (T).	**77%**
		People with AD are very agreeable, cooperative and easy to live with (F).	41%
		Severe memory loss is always caused by disease and is not a common problem in the elderly (T).	**78%**
Purandare et al. (2007)[39]	Dementia knowledge questionnaire.[48]	Dementia can affect following:	
		Vision	**46–91%**[†]
		Personality	**53–86%**[†]
		Reasoning	**58–92%**[†]
		Memory	20–-3%[†]
		Mobility	**73–78%**[†]
		Speech	**58–80%**[†]
		Incontinence	**76–81%**[†]
		Life expectancy	**69–84%**[†]
Roh et al. (2015)[40]	The depression in late life quiz.[46]	It is normal for older people to feel depressed a good part of the time (F).	**69.8%**
		Memory problems may be a sign of depression (T).	44.3%
		Depression is easy to recognise in an older person who is physically ill (F).	49.6%
		Older people are more likely than younger people to say, 'I am depressed' (F).	**63.2%**

Table 3 Continued

Authors	Type of measure	A description of relevant recognition items	Older adults incorrect answers (%)
		It is common for older people to talk about potential suicide (F).	**84.5%**
		Health professionals often have difficulty diagnosing depression in the older person (T).	**51.1%**
Werner (2002)[44]	Knowledge of AD items[49]	Although most people with AD are older adults, people in their 30s and 40s can be diagnosed with AD (T).	47.8%
		Most family physicians are trained to diagnose AD (F).	37.1%
		AD can be diagnosed by a blood test (F).	26.9%
		The primary symptom of AD is memory loss (T).	14.5%
		Significant loss of memory and mental ability, commonly known as senility, is a normal part of aging (F).	**63.4%**

[†] Varies as a function of ethnic group.

group. One study reported lower depression recognition rates for Chinese immigrants compared to their Canadian born counterparts.[43] In another study older participants were more likely to identify depression if they were White, compared to Hispanics and African-Americans.[26] Other cross-cultural comparisons showed that Anglo older adults in the USA were more knowledgeable of Alzheimer symptoms than Latino, Asian, and African-American older adults[19] and that poorer dementia symptoms knowledge was documented for Indian compared to Caucasian older people.[39]

These cross-cultural differences may be attributed, at least in part, to the fact that native-born adults have better English proficiency and higher levels of formal education compared to immigrants.[19] Moreover, several studies conducted among older Korean-Americans found a positive association between acculturation levels and general mental illness knowledge, such that those who were more acculturated to mainstream American culture were also more knowledgeable about mental illness.[27,28,33] However, it is of note that this association refers to general dementia/depression knowledge scores and not necessarily to knowledge of symptoms or mental illness recognition.

Socio-demographic factors

Socio-demographic variables, including being female,[10,32] more educated,[11,26,28,32,38,40,44] married[44] and younger[32,45] older adults, were associated with better MHL in general, and mental health recognition in particular. Overall, formal years of education appear to be the most influential demographic factor in this regard.[32] Another factor contributing to MHL is familiarity with mental illnesses, with older adults more familiar with depression in real life, also exhibiting more literacy about depression.[25,40] Similarly, having friends/family suffering from dementia was found to be associated with increased dementia/Alzheimer literacy at older age.[32,33,38] However, once again these associations refer to mental health knowledge in general and not to recognition *per se.*

Variants of mental illness in older age

Symptom presentation may impact older adults' identification of depression. In the study by Gum *et al.*,[26] when depression was described in the presence of dysphoria or sadness, it was identified correctly more often compared to when the vignette described depression with anhedonia but without sadness (48% vs. 34%, respectively). These findings correspond with findings showing that older adults' recognition of mental illness may be especially poor when an elderly client is involved. Two vignette studies randomly altered the protagonist's age and found that when the protagonist was 70 years old, participants regardless of their age were less likely to recognise the symptoms described in the vignette as a mental illness, than when the protagonist was described as 30 years old.[10,24]

Analysis of qualitative studies

The 10 qualitative studies and one mixed methods study were also methodologically variable, with a majority focusing recognition of depression and dementia among ethnic and racial minorities in the USA, UK and Canada (n = 7). While the majority of these studies targeted community-dwelling residents, four studies included older adults suffering from

depression and another study focused on older adults recovering from a current ischaemic stroke. One study focused solely on elderly women. Five of the studies used case vignettes as means to facilitate discussion in focus groups. The remainder used interview manuscripts including open-ended questions on mental disorders symptoms knowledge and recognition (e.g., 'How will depression be interpreted?'; 'Describe the symptoms of depression.').[22,31]

We identified four reoccurring themes in these studies: (1) awareness of mental illnesses; (2) mental illness as a (non)-medical condition; (3) normalisation of symptoms; and (4) cultural aspects.

1 *Awareness of mental illnesses.* One study reported that the majority of older participants (Asian immigrants residing in Canada) exhibited limited awareness of the nature and extent of mental disorders among older adults.[41] Other studies from diverse elderly populations reported that participants commonly exhibited familiarity with mental illness symptoms, although they also reported a lack of recognition of the overall mental syndrome.[2,21,22,31,35,36,42] In other words, older adults, regardless of their ethnic identity, are often unable to label mental disorders symptoms as mental illness. Moreover, the difficulty to recognise depression was conceptualised in one study as a barrier to seeking professional mental health treatment among African-American older adults .[22]

2 *Mental illness as a (non)-medical condition.* Most of the qualitative studies focusing on depression reported that older participants do not consider depression to be a disease.[20,30,31,35,36] Two studies similarly reported that a majority of participants did not view dementia as a disease.[21,36] The most common criterion for perceiving depression as an illness was its profound effect on a person's ability to live his/her life.[30]

3 *Normalisation of symptoms.* Depressive symptoms are commonly labelled as 'psychological distress', 'unhappiness', 'sadness', 'tension' and other affective descriptors.[20,31,36] In the study by Lee *et al.*,[31] 69.8% of participants described depression using affective terminology. These findings, and the fact that depression and dementia are often not recognised as a disease or mental illness, may be related with older adults' tendencies to view mental symptoms as a normal part of life and/or as a

natural process of aging, both in cases of dementia[23,36] and depression.[20,22,30]

4 *Cultural aspects.* In several studies,[36,42] although depression and dementia were recognised, there were no equivalent terms for them in the native respective language (e.g., Spanish). For example, most of the older Hispanic-American participants in Sadule-Rios and colleagues' study recognised that the problem depicted in the vignette was depression; however, they were quick to explain that depression was the term used in 'this country', the USA. Other studies also described the language used for depression to be culturally dependent.[20,30]

Common barriers of recognition apparent at older ages may be magnified among older minority members, due to the intersection between age and other dimensions of inequality such as ethnicity and race. For example, the previously discussed difficulty to differentiate between normal sadness and depressive symptoms was particularly evident among older African-Americans, explaining that since many people in their community are struggling and feeling distressed, depression is often disregarded as being just another feature of the African-American experience.[5,22]

DISCUSSION

The ability to recognise mental illness is an essential component of MHL. Limited ability for self-recognition of mental illness may lead to a delay or failure in receiving professional help. Our findings suggest that older adults are less likely to correctly recognise mental disorders, across studies that were heterogeneous in terms of location, target population, type of methodology, targeted mental illness and mental health recognition measures.

Several studies directly compared older and younger adults, with most of them documenting poorer mental illness recognition among older adults compared to their younger counterparts. Other factors associated with poorer recognition among older adults were: using open-ended questions, assessing recognition through knowledge questionnaires, describing typical older age variants of mental illness (i.e., depression without sadness) and including an older aged protagonist in vignette studies. These last two findings are especially troubling, since depressed

older adults are less likely to display affective symptoms and are more likely to display cognitive changes, somatic symptoms, and loss of interest.[50] In other words, older adults are more susceptible to depression without sadness, but are also less likely to recognise this type of depression.

Older adults from ethnic minorities generally exhibit poorer recognition of mental illness, likely due to linguistic and cultural barriers. Older minority group members represent a double-minority social group and as such, this population may face barriers related to both their age and their culture. These findings are congruent with evidence documenting higher undetected depression and dementia rates among older immigrants and ethnic minorities compared to members of dominant social groups.[51] However, most of the knowledge in this area appears to rely on qualitative investigations, and cross-cultural comparisons are limited in scope. Most notable factors associated with poor self-recognition among older minority group members include mental health misconceptions, a lack of mental health labels from native languages and limited awareness.

Methodologically, the studies included in the current review used different approaches to measure mental health recognition, including vignette description of specific symptoms and self-report knowledge questionnaires. While vignettes lack fixed question formats and answer scales, there are multiple versions of knowledge questionnaires, commonly without systematic validation. The difficulties in current MHL measurements were previously discussed.[52] The main challenges include a lack of scale-based scoring systems, a lack of standardisation, and a lack of scales that concurrently measure all MHL components. Focusing specifically on older adults, many recognition measures may be criticised for not including age-specific variant descriptors of mental disorders (and depression in particular). Developing more robust instruments, designed to capture MHL issues across varied age and cultural groups, may help to overcome some of these shortcomings.

The review has several limitations. First, this review employed only one database, which might have narrowed the scope of articles retrieved. Furthermore, the chosen keywords may not have been broad enough to capture all published research on the topic. However, hand-searching the reference lists managed to locate papers not indexed by the database search.

As we emphasised in this section, 'older adults' should not be viewed as a single, unitary group. Future research should provide a closer inspection of age differences in mental illness recognition among older adults. There are several findings of poorer recognition among older old adults, compared to younger old adults.[37] A better understanding of age effects among older adults may help to develop education programs directed specifically at older old adults.

Cueing older participants with mental labels improves their MHL. Therefore, older adults may be able to recognise depression more accurately when others discuss it with them.[26] Indeed, higher levels of informational social support were found to be associated with more willingness to use mental health services among older adults.[53] Older adults often prefer to consult their family/friends regarding mental health issues rather than seeking professional advice from a mental healthcare specialist.[9] Future research should focus on ways to utilise the social networks of older adults to improve mental illness management and care. For example, whether certain aspects of older adults' social networks (e.g., social network size, diversity, and frequency of contacts) may be associated with improved MHL.

CONCLUSIONS

Our findings emphasise that older adults' mental health literacy is a matter for the community as a whole. It is imperative that the public will be aquatinted with mental illness labels as means to encourage recognition of mental disorders in both oneself and others. Moreover, the predominant emphasis on depression in public health programs may simply not be effective where older adults are concerned, due to objective (limited access to information) and subjective (mental illness phenomenology) factors are relevant at older ages. The findings also have implications for healthcare professionals, who need to be aware of the unique manifestations of depression at older age, especially in light of evidence from primary care physicians that depression without sadness is hard to detect.[54] Moreover, achieving a deeper understating of cultural and socio-demographic effects may allow for developing more context-sensitive mental health information campaigns,

tailored by specific needs, conceptualisations and motivations of the target population.

According to Jorm,[55] central in the MHL framework is the notion that the person affected by the disease is seen as the primary agent in symptom management. Adopting this framework to older adults may offer extensive social implications. In light of the UN's World Health Organization Active Aging Policy Framework's[56] call to promote 'active ageing', improved MHL at older age may encourage older adults to be included as full partners across diverse social, cultural, and civic affairs.

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