**Dementia in Eastern Mediterranean Countries:**

**A Systematic Review**

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**Abstract**

Globally, there is an increase in the older population, whose lives are affected by local cultural norms. In Eastern Mediterranean countries (EM), dementia is conventionally hidden from view with few dedicated services or recognition for diagnosis. The aim of this systematic review is to explore the limited literature on dementia and cognitive impairment among older people in EM countries to present an evaluation of current practices and to consolidate knowledge for future planning. Thirty-three studies were identified for inclusion in the review, and four themes were apparent. Firstly, prevalence, comorbidity, and gender: In EM countries, many studies identify that the prevalence of dementia is high. As is the case elsewhere, many older adults in EM countries have at least one coexisting long-term condition, and some experience low life-satisfaction. Secondly, culture: In EM countries, the older adult is highly respected, and placement outside of the family home is considered an abandonment of family duty. The term dementia carries stigma, and it is widely believed that dementia is caused by ‘fate’. Thirdly, recognition and tools: There are a lack of verified assessment instruments to assess for dementia. Despite concerns about the cultural appropriateness of the Mini-Mental-State-Exam, particularly for people who have low literacy levels, and low literacy being the norm in EM countries, the Mini-Mental State Examination is the main assessment instrument. Translation and transition of non-Arabic assessment instruments and tools with psychometric properties presents a challenge for clinicians. Finally, workforce issues: health care workers lack knowledge about dementia, as dementia care is a relatively recent addition to the nursing and medical syllabi. While there were some inconsistencies in the papers published, many of the articles call for increasing educational programmes and health and social care policies to promote improved and practical gerontological nursing and medicine. Healthcare professionals need education about sociocultural, religious, and language needs to deliver improved culturally sensitive care.

**Keywords**

Dementia, Cognitive Impairment, Eastern Mediterranean, culture, Alzheimer’s Disease, healthcare

**Introduction**

This paper aims to explore what is currently known about dementia and cognitive impairment among the older population in Eastern Mediterranean (EM) countries, to identify current practices and identify needs for future development. It is estimated that in 2016, 47 million people around the world live with dementia; 2.3 million of whom live in EM countries (Schillings & Wahnsiedler, 2016). By 2030, this number is expected to increase to 4.4 million people living with dementia in EM countries (Schillings & Wahnsiedler, 2016). The increase in the older population in EM is consistent with growth globally (World Health Organisation [WHO], 2006).

The EM consists of 22 countries: Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kingdom of Saudi Arabia (KSA), Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Somalia, Sudan, Syria, Tunisia, United Arab Emirates (UAE), and Yemen, grouped for representation with bodies such as the World Health Organisation. The EM has 670 million people, with populations ranging from 196.7 million in Pakistan and 95.2 million in Egypt to 2.6 million in Qatar (Cent, 2015; Cipriani & Borin, 2015; Ministry of Health [MOH], 2016; Okasha & Boutros, 2010; Worldometers, 2016). Global life expectancy is 71 years, and the average life expectancy in EM countries is 68.8 years. Life expectancy however varies in the EM from 78.2 years in Qatar; to 77.9 in Iran; 77.1 in UAE; 74.5 in KSA, Jordan, Kuwait, Lebanon, Morocco; 70.9 in Egypt; and at its lowest in Afghanistan at 60.5 years (MOH, 2016; WHO, 2015, 2017). This compares with life expectancy of 76 years for a boy born in a high-income nation in 2012 (WHO, 2015). With an increase in life expectancy and in the older population, dementia has become one of the most prevalent public health issues.

**Method**

In February 2017, a systematic search was conducted in scientific databases, including DelphiS, CINAHL, MEDLINE, OVID, ProQuest, Embase and PsychINFO, using the following keywords: *older adult, old\*, elder\*, geriatric,* and *senior*, in combination with *dementia, Alzheimer’s\*, cognitive impairment, cognitive decline, memory loss, Lewy Body, Parkinson\*, Vascular dementia*. These terms were then combined with the names of relevant 22 EM countries i.e. *Saudi, Arabia*\*, *Egypt, Emirate, Kuwait, Middle* *East*\*, or *Eastern* *Mediterranean* and studies in both English and Arabic (Table 1). In total, 1,740 articles were found that were then limited to peer-reviewed articles published from 2007-2017, leaving *n*=687 articles. Duplicate and irrelevant articles were excluded based on title and abstract, leaving *n*=99 articles. Further research conducted using Google Scholar added *n*=11 articles. However, considering the search limitations in the current study, finding recent data from the EM region from the past few years was challenging. Hence, searching for articles from the last 10 years proved more worthwhile. English and Arabic articles are the most accessible and most frequently used languages within the EM region. A limitation to peer-reviewed articles with the full-text available was applied as well to find best available evidence. The exclusion and inclusion criteria are outlined in Table 2.

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| --- | --- | --- | --- |
| Main term | Older adult | Dementia | Arab |
| Alternate terms | “old\*”, “*older adult*”“elder\*”, “geriatric”, or“senior” |  “*dementia*”, “Alzheimer\*”, “cognitive impairment”, “cognitive decline”, “memory loss”, “*Lewy Body*”, “*Parkinson\**”, or “*Vascular dementia*” | “Arab\*”,  “middle east\*,“Eastern-Mediterranean”, “Afghanistan”, “Bahrain”, “Djibouti”, “Egypt”, “Emirate”, “Iran”, “Iraq”, “Jordan”, “Kuwait”, “Lebanon”, “Libya”, “Morocco”, “Oman”, “Pakistan”, “Palestine”, “Qatar”, “Saudi”, “Somalia”, “Sudan”, “Syria”, “Tunisia”, or “Yemen”  |

Table 1 Search terms and alternative terms/synonyms

|  |  |  |
| --- | --- | --- |
|  | Limitation | Reason |
| Years  | 2007- 2017 | Finding recent data in EM region for the past few years is challenging, hence, searching articles of the past decade will be worthwhile |
| Language | English and Arabic | English and Arabic articles are more accessible and understandable, as well as the most frequently used within the EM region  |
| Other | Peer-reviewed Available texts | Looking at evidence based journals with best available evidence |

Table 2 Inclusion criteria to pertain search

Thirty-three articles were found using the search terms and search strategy (Figure 1, Table 3). The quality of the 33 studies was checked using the Joanna Briggs Institute (JBI) checklist, the Critical Appraisal Skills Programme (CASP) and the Mixed Method Appraisal Tool. Twenty-seven studies were assessed to be of ‘good quality’, and six were ‘average’ (Aromataris, Fernandez, Godfrey, Holly, Kahlil, & Tungpunkom, 2015; CASP, 2017a, 2017b, 2017c; JBI, 2016; Lockwood, Munn & Porritt 2015; Pluye et al., 2011). However, studies having an average quality were included in this review due to the limited number of studies available and due to their valuable contributions to the field.

There were eleven cross-sectional studies; four of these estimated the prevalence of Alzheimer’s disease, Parkinson’s disorder and mild cognitive impairment, and discussed the risks associated with sociodemographic factors; *n*=944 Palestinian, in addition to *n*=200 and *n*=44 Egyptian from two studies, and, *n*=221 Jordanian (Afgin et al., 2012; Esmayel, Eldarawy, Hassan, Mahmoud, & Mohamed, 2013; Khedr et al., 2015; Almomani, Almomani, Alghadir, Alharethy, & Gabr, 2016). A cross-sectional study in the Netherlands (Parlevliet et al., 2016) determined the prevalence of dementia and mild cognitive impairment across cultures, based on Arab participants (*n*=1625), and assessed the validity of the Cross-Cultural Dementia Screening tool (Goudsmit, Uysal-Bozkir, Parlevliet, van Campen, de Rooij & Schmand, 2016). Two cross-sectional studies that used hospital-based data to assess morbidities and risk factors among older people were included in the review; *n*=880 Saudis and *n*=5,399 Arab Americans (Almodeer, Hassanien & Jabloun, 2013; Dallo, Ruterbusch, Kirma, Schwartz & Fakhouri, 2016). In Saudi Arabia, Alaama (2016) assessed 70 medical students’ knowledge of geriatrics, and Yaghmour, Gholizadeh and Alsenany (2016) explored 265 nurses’ knowledge of dementia. Alsenany and Alsaif (2012) conducted a comparison study that explored the intentions of Saudi (*n*=566) and British (*n*=718) nursing students regarding working with older people.

Among the articles there were 10 reviews, of which two were systematic reviews. Okasha and Boutros (2010) reviewed influential papers about psychiatry from Arab countries. Halabi and Zafar (2010) explored care of the elderly in UAE, while Alabed, Davidson and Hickman, (2014) systematically reviewed eight studies that explored the healthcare needs of immigrant Arab older people in Australia. Furthermore, Cipriani and Borin (2014) explored the phenomena of dementia across cultures, and Abyad (2015) in Lebanon focussed on the EM population. Sayegh, Kellough, Otilingam, and Poon (2013) discussed the issues associated with dementia and mood and anxiety disorders among older Arab Americans. Werner, Friedland and Inzelberg(2015) studied the prevalence of Alzheimer’s disease with respect to ethnic differences. Regarding prevalence of dementia, two reviews intended to explore the systematic approaches used in Iran and Egypt (Sharifi et al., 2014; Elshahidi, Elhadidi, Sharaqi, Mostafa & Elzhery, 2017). Meanwhile Uysal-Bozkir, Parlevliet and Rooij (2013) assessed the quality of cross-cultural adaptation of psychometric tools including assessment of cognition.

Figure 1 Study PRISMA chart

Records identified through database searching

(n = 1,740)

Identification

Additional records identified through other sources

(n = 11)

 Peer-reviewed, from 2007–2017, English and Arabic languages and available text

(n = 687)

Records after duplicates removed

(n = 281)

Articles assessed for eligibility

(n = 99)

Articles excluded, with reasons: pharmacological, biomedical, paramedicine and hematological studies; tool validation; and research on non-Eastern Mediterranean regions
(n = 68)

Studies included
(n = 33)

n = 11 cross-sectional studies

n = 10 reviews

n = 5 cohort studies

n = 5 mixed-method studies

n = 2 qualitative studies

Screening

Eligibility

Included

Five cohort studies focused on the prevalence of neurocognitive disorders, including dementia, and they explored the relation between these disorders and risk factors and morbidities; *n*=33,285 Egyptians, *n*=982 Palestinians, *n*=53 and *n*=313 Saudis in different studies (Eltallawy et al., 2013a, 2013b; Spalter, Brodsky & Shnoor, 2014; Amr, Elgilany, Sallam, & Shams, 2014; Alhawiti, Alfaer, Altuwaylie, & Elbadawi, 2016). Two mixed method studies out of these five explored attitudes of healthcare workers and caretakers towards older people with dementia; *n*=132 Saudi nursing faculty members and *n*=20 Palestinian caretakers (Alsenany & AlSaif, 2014; Bentwich, Dickman & Oberman, 2016). Meanwhile, Ayalon, Heinik and Litwin (2010) explored the cross-cultural differences of Palestinian older adults (*n*=2,492). In 2013, Khan et al. in Saudi Arabia and Boulos, Salameh and Barberger-Gateau in Lebanon used the mixed method study design to assess and evaluate the nutritional status of older people with dementia (*n*=63, *n*=1,200, respectively). Finally, two qualitative studies from UAE were included which examined the effects of psychiatric and physical disorders on life satisfaction among 610 older people (Ghubach, Elrufaie, Zoubeidi, Sabri, Yousif & Moselhy, 2010). Furthermore, another qualitative study was included that was conducted with 121 Arab immigrants in Australia which examined the care provided by family members (Boughtwood, Adams, Shanley, Santalucia & Kyriazopoulos, 2011).

**Findings**

The data were analysed using NVivo 11. The 33 articles were read and coded for themes. Four themes were identified in the articles that are presented below. They are Prevalence, comorbidities and gender, Culture and religion, Recognition and assessment procedures, and Workforce issues.

*Prevalence, comorbidity, and gender*

In the EM region, awareness has increased of the prevalence of dementia in general and particularly Alzheimer’s disease (Werner et al.*,* 2015; Elshahidi et al., 2017). It is generally agreed that dementia, cognitive impairment and Alzheimer’s disease are more common in the over 70s (Almomani et al., 2016; Elshahidi et al., 2017). However, there were a number of conflicting findings among the studies. In one study among Palestinian was found to demonstrate a higher prevalence of Alzheimer’s Disease compared to western countries (Afgin et al., 2012). In contrast to this research, Ayalon et al. (2010) found lower levels of dementia among Palestinian. In an epidemiological study in Egypt, the prevalence of neurological disorders, including dementia, was higher than the global data (Eltallawy et al., 2013a, 2013b).The study included 8,183 people over the age of 40, and found that nearly 4% of participants above 60 years experienced dementia as a common neurological disorder (Eltallawy et al., 2013a). Additionally, a study conducted in North Egypt that included participants with Parkinson’s disease found a high prevalence of Parkinson’s disease, with 14.3% of participants exhibiting mild dementia (Khedr et al., 2015; Elshahidi et al., 2017), and the authors indicated that the prevalence of Parkinson’s disease was higher than in other cities worldwide (Eltallawy et al., 2013a; Elshahidi et al., 2017). A lack of health professionals and the absence of neurologists and gerontologists in the area meant that prevalence was under-reported, and increased pollution was identified as a contributing factor for higher prevalence (Eltallawy et al., 2013a; Elshahidi et al., 2017). Another two Egyptian studies suggested that the high prevalence of Parkinson’s disease was possibly associated with air and water pollution and genetic susceptibility (Khedr et al., 2015; Elshahidi et al., 2017).

In the Netherlands, a cross-sectional study with immigrant younger adult participants (*n*=2254), of whom 31% were from the EM, showed there was a higher prevalence of mild cognitive impairment and dementia at three to four times greater than that among native Dutch. Higher prevalence of dementia among immigrants was associated with a higher incidence of vascular risk factors and psychiatric disorders, such as depression (Parlevliet et al., 2016). Similarly, a study found that Arab participants above 60 years demonstrated a prevalence of Alzheimer’s disease four times greater than that of non-Arabs 75 years and older in the same area when tested with a similar diagnostic tool (Werner et al., 2015) attributed to genetic aspects and high illiteracy rates among Arabs. Overall, the EM community has a high prevalence of cognitive impairment (Cent, 2015; Werner et al., 2015).

Bentwich et al. (2016) in Palestine, found that the attitudes towards the dignity and autonomy of people with dementia differed significantly between Arabs and Russians. Arab people were brought up to respect the concepts of self-respect and independence, and thus demonstrated better grounds for person-centred care in a healthcare setting. However, Arab Americans and white Americans were compared in a study that showed no significant differences in their experiences of Alzheimer’s disease (Dallo et al., 2016).

 Older age is the main risk factor for dementia (Werner et al., 2015; Elshahidi et al. 2017). The prevalence of Alzheimer’s disease and mild cognitive impairment is higher in women than in men; this is typically attributed to the fact that women live longer than men. However, this review found that a high rate of illiteracy was found among one study sample (Afgin et al., 2012) which influences assessment scoring. While illiteracy and education were strongly associated with the prevalence of Alzheimer’s disease, higher levels of education among participants resulted in less impairment in tests (Ayalon et al., 2010; Werner et al., 2015) highlighting how tests are biased toward educated people. Yet, the authors indicated that the incidence of Alzheimer’s disease in the Arab population is greater than that in a population with a similar literacy and educational profile (Eltallawy et al., 2013a, 2013b).

Women in this region are not seen in hospitals as frequently as men. Women are dependent on men, and they are thought to be more tolerant of psychological and physical pain than western women (Eltallawy et al., 2013a, 2013b; Amr et al., 2014; Dallo et al., 2016). A mixed-method, cross-sectional study conducted in a rural setting in Lebanon found significant differences between genders (Boulos et al., 2013). Women demonstrated significantly higher rates of illiteracy and lower income than men, risks associated with chronic illness, poor self-perceived health, fragility and functional disability. Additionally, women also showed higher prevalence levels than men of depressive symptoms and cognitive impairment (Eltallawy et al., 2013b; Boulos et al., 2013; Alhawiti et al., 2016).

A descriptive study conducted in KSA that reviewed the morbidity profile at hospitals found that co-existing conditions were common among the sample. While 16.5% of older adults had two long term conditions, almost 22% experienced three and approximately 51% had four or more illnesses, leading to challenges for healthcare providers (Almodeer et al., 2013). These were hypertension, diabetes mellitus, stroke, dementia, osteoarthritis and Alzheimer’s disease (Almodeer et al., 2013), and women were at higher risks of developing these conditions.

A population-based study conducted in KSA, found a 13% prevalence of dementia among older adult participants. The comorbidity rate was high at 52.8%, while the rates of hypertension, cardiac problems and diabetes were 45.3%, 30.2% and 23.7%, respectively (Amr et al., 2014). Furthermore, a retrospective study conducted in KSA of individuals with Alzheimer’s disease, dementia with Lewy bodies, frontotemporal dementia and vascular dementia, acknowledged diabetes, hypertension and vascular disorders as risk factors. It was found that these illnesses maximise the risk of earlier-onset dementia (Alhawiti et al., 2016), and participants with multiple risk factors experience earlier-onset dementia (Amr et al., 2014; Alhawiti et al., 2016). In addition, Spalter et al. (2014) found that older adults who live with someone other than a spouse have a higher number of diseases and comorbidity factors.

In a cross-sectional study conducted in Egypt of older adults, depression and cognitive impairment were identified as the most common mental health problems among older participants, with a 30% prevalence of cognitive impairment among medical inpatients (Esmayel et al., 2013). In addition, the study detected a significant relationship between cognitive impairment and each depressive symptom (Esmayel et al., 2013). Likewise, in the UAE, among older adults who were interviewed, nearly 25% were diagnosed with depression, while almost 6% have anxiety, approximately 4% have hypochondriasis and 4% have organic brain syndrome with or without dementia (Ghubach et al., 2010). Additionally, decreased life satisfaction was markedly accompanied by anxiety, hypochondriacal disorders and organic brain syndrome. Nearly half of the study sample was dissatisfied with their lives, and among the older adults aged above 85, the level of life satisfaction was low, particularly among those participants who live alone or only with a spouse (Ghubach et al., 2010).

*Culture* *and Religion*

In the EM region, older adults are highly respected within the family (Halabi & Zafar, 2010; Amr et al., 2014; Spalter et al., 2014; Cipriani & Borin, 2015), and family members are discouraged from institutionalising older adults. In general, emphasis has been placed on respecting, valuing, honouring and caring for older family members driven by Islamic values (Alabed et al., 2014), that call for collective care toward vulnerable people. The oldest members of EM families represent wisdom, love, blessings and faith, and their opinions are usually predominant within the family as their opinions are held in the highest regard (Alabed et al., 2014; Alsenany & Alsaif, 2014; Cipriani & Borin, 2015) that is features in the religious instruction to care for elders. In addition, in the EM, older adults are treated with gratitude and respect, spoken to in soft voices and referred to as mother/father of the oldest son or as the father’s name (Alsenany & Alsaif, 2014).

Disabled and vulnerable older adults are often cared for by family (Halabi & Zafar, 2010; Abyad, 2015), as it is important to value older adults’ autonomy and dignity (Bentwich et al., 2016). Commonly, older adults in the EM region are primarily supported emotionally and socially by their families, often tribal, and few live alone (Halabi & Zafar, 2010; Sayegh et al., 2013; Amr et al., 2014). If an older adult needs assistance, the family will typically hire a caregiver or a nurse at home; if the family cannot afford a caregiver or nurse, the older adult must remain in the care of his or her relatives (Halabi & Zafar, 2010; Alabed et al., 2014; Abyad, 2015). Introducing the older person to a care facility is considered abandonment of a family duty, which is unacceptable. Consequently, the EM region has few care facilities (Halabi & Zafar, 2010; Alsenany & Alsaif, 2012; Sayegh et al., 2013; Amr et al., 2014; Abyad, 2015).

In the EM, caring for a family member with a cognitive impairment can lead to anxiety, loss, fear, shame and ignominy of the family character. Regardless of global changes in terms of perceptions of mental illness, EM families remain influenced by restrictive social beliefs and cultural norms (Alabed et al., 2014). Even with limited facilities available within the region, people feel ashamed to receive care from a non-family member, and they believe that providing this care is the duty of relatives (Halabi & Zafar, 2010; Alsenany & Alsaif, 2012; Sayegh et al., 2013; Alabed et al., 2014; Amr et al., 2014).

As a person ages, levels of dependency and care complexity increase due to deteriorating autonomy and capabilities (Bentwich et al., 2016). Therefore, older adult care is provided in acute settings when medical evaluations and nursing care are needed. Older people do not seek preventive care but will access medical treatment if they have a recognisable illness, such as hypertension, diabetes or hyperlipidaemia, or help for behavioural problems associated with moderate and severe stages of cognitive impairment (Alsenany & Alsaif, 2012; Sayegh et al., 2013). Dementia is viewed as a normal part of ageing and people are less likely to seek medical support for memory issues (Okasha & Boutros, 2010; Esmayel et al., 2013; Sayegh et al., 2013). Fate, *Qadar* (God’s will), evil spirits and the evil eye are cited as causes of illness by many in the EM (Okasha & Boutros, 2010; Eltallawy et al., 2013a; Sayegh et al., 2013; Alabed et al., 2014; Amr et al., 2014; Cipriani & Borin, 2015).

Sometimes, dementia is deemed pathological (Alsenany & Alsaif, 2012; Alaama, 2016). Cipriani & Borin (2015) claim that members of the EM community find it difficult to recognise dementia as an illness, and are reluctant to accept a diagnosis. It has been suggested that this stigma is due to the Arabic translation of the word *dementia* and its relation to mental illness. In Arabic, dementia is called *Kharaf*, meaning ‘unravelled’ or ‘lost the mind’, which leads to negative connotations in understanding the word (Cipriani & Borin, 2015). Researchers suggest that stigma and stereotyping can alter dementia care and treatment (Okasha & Boutros, 2010; Alabed et al., 2014; Alaama, 2016). Therefore, they recommend the term *mild cognitive impairment* be used for diagnoses other than Alzheimer’s Disease (Afgin et al., 2012), as it is considered more acceptable (Okasha & Boutros, 2010; Afgin et al., 2012).

Palliative care decisions such as artificial feeding and resuscitation are viewed as purely medical decisions and are not openly discussed by families (Halabi & Zafar, 2010; Alabed et al., 2014). Most of the Arab population depend on traditional and religious healers (Okasha & Boutros, 2010; Alabed et al., 2014), which creates obstacles to pursuing medical care when it may be beneficial.

*Recognition and assessment procedures*

Recognition of dementia through assessment is instrumental in slowing disease progression by introducing treatments (Halabi & Zafar, 2010; Khan et al., 2013; Sayegh et al., 2013). A study found that older adults of the EM community were insufficiently studied (Sayegh et al., 2013), as language barriers and a lack of verified assessment instruments are considered obstacles in recognising and treating dementia. A problem was identified regarding translation and the use of culturally accepted terminology in the participants’ native language to describe separately mental and physical distress (Sayegh et al., 2013). Dementia was determined at a late stage and cared for by general practitioners because of the low number of gerontologists (Halabi & Zafar, 2010; Alsenany & Alsaif, 2012; Esmayel et al., 2013). Most clinics and hospitals use the Mini-Mental State Examination (MMSE), despite many researchers having claimed that this tool is inaccurate in its scoring and that it is unsuitable for the EM’s high number of illiterate older adults (Afgin et al., 2012). Hence, education level and low MMSE score are correlated. Conversely, a study recommended that almost all physicians should use the MMSE and Neuropsychiatric Inventory for the early detection of dementia and neurocognitive impairment (Amr et al., 2014).

EM countries face a challenge in evaluating psychometric properties because of a lack of high standard, cross-cultural, adapted assessment instruments. In most cases, use of the instruments is considered mediocre (Uysal-Bozkir et al., 2013). For example, EM immigrants form minority ethnicities in host countries, with limited knowledge regarding the host country’s culture and language, and many are illiterate or they have low education levels. Hence, a cross-cultural dementia-screening test was used in the Netherlands as an appropriate, culturally sensitive neuropsychological instrument for dementia screening of a low-educated immigrant population (Goudsmit et al., 2016). It showed validity in predicting dementia among the 1,625 participants in the Netherlands who were illiterate, had lower education or were culturally different or who had language barriers. The test results showed lower MMSE scores, and the recommendation was to use this instrument in memory clinics along with a standard multidisciplinary diagnostic check-up (Goudsmit et al., 2016).

*Workforce issues*

Numerous studies aimed to investigate health professionals’ knowledge and perceptions regarding geriatric peoples and some neurological problems, such as dementia, where several reviews reported a lack of personnel trained in dementia care (Halabi & Zafar, 2010; Alsenany & Alsaif, 2014; Alaama, 2016; Yaghmour et al., 2016). In the KSA, a study found a knowledge deficit among medical students, despite geriatric medicine being introduced into a residency programme in early 2016 (Alaama, 2016). The results of focus groups and nursing faculty member surveys suggested that more gerontological content and clinical experiences are needed in the nursing curriculum (Alsenany & Alsaif, 2014). Another study that investigated nurses’ knowledge of dementia, depression and delirium found the need for increased dementia training, as insufficient dementia knowledge was detected among the study’s participants (Yaghmour et al., 2016).

In a comparative quantitative study of Saudi and British nursing students, the students assumed that caring for older adults was similar to general nursing in an acute care setting (Alsenany & Alsaif, 2012). Saudi students found that establishing a nurse–client relationship with older adults was easy because older adults in Eastern cultures are talkative and easy to communicate with (Alsenany & Alsaif, 2012). A qualitative study conducted in Australia found that EM families were the most sensitive amongst the study sample, with participants reporting many emotions, including grief and anxiety, associated with living with a person with dementia (Boughtwood et al., 2011). Regarding dementia-related behaviours, EM carers were the least concerned, whereas families were heavily involved in care (Boughtwood et al., 2011).

**Discussion and recommendation for future studies**

While there are cultural differences and variations in State care provision, EM countries share many values and cultural beliefs, and common history and heritage (Okasha & Boutros, 2010; Cipriani & Borin, 2015). Throughout the world, there are differences in the way that dementia is assessed and treated and how care is provided for people with dementia and their families. Cultural norms affect how older people are subjected to stigma, and whether there are obstacles related to getting help with diagnosis and treatment of dementia (Faisal, 2014). Dementia is conventionally overlooked in EM countries, as its diagnosis, treatment and management are not widely available to the general population (Okasha & Boutros, 2010; Almodeer et al., 2013; Schillings & Wahnsiedler, 2016). For example, in KSA, accessing such services must be done through private geriatric and memory clinics that are available only in major KSA cities, a fact that consequently affects health and wellbeing (Alsenany & Alsaif, 2012; Almodeer et al., 2013; Amr et al., 2014).

In the EM region, the term *dementia* first appeared in the literature in the early 1990s, and in the late 1990s, researchers first recognised dementia as a cause of death (Loza & Milad, 1990; Ozand, Gascon & Dhalla, 1990; Alrajeh et al., 1993; Alansary & Alrajeh, 1994; Ogunniyi, Daif, Alrajeh, Abduljabbar, Altahan, Albunyan & Shamina, 1998). The most prevalent dementias are Alzheimer’s disease, vascular dementia and Parkinson’s disease (Ogunniyi et al., 1998; Benamer et al., 2008). At present, there are few geriatric specialists available in the region and there are limited facilities specialising in geriatric care (Alrajeh et al., 1993; Ogunniyi et al., 1998; Benamer et al., 2008; Eltallawy et al., 2013; MOH, 2016).

While there has been recent increased focus on dementia in the EM region, significant steps are needed to provide people with dementia the care needed to improve their wellbeing. There is a lack of public awareness about and organised efforts to mobilise resources and deal with dementia and the provision of proper care. How older people view and experience their health has a significant impact on wellbeing (Benamer, de Silva, Siddiqui & Grosset, 2008; Qannam & Bello, 2016), which includes perceived health and especially psychological wellbeing, the impacts of long term conditions and functional impacts of impairments (Benamer et al., 2008; Almodeer et al., 2013; Amr, El-Gilany, Sallam & Shams, 2014; Ullah, Qamar, Qureshi & Niaz, 2016). To promote wellbeing, people need to be able to access the right support. Furthermore, in EM countries, the placement of older adults’ relatives in care facilities is considered abandonment of a family duty (Andrews, 2014). Consequently, the care provided to people with dementia depends on the family carer’s own knowledge and skills (Ghubach et al., 2010; Alabed et al., 2014), which varies.

Over the last few decades, several studies have called for epidemiological data, as data regarding dementia in the EM region are scarce. Studies indicated a lack of published data on dementia incidence and prevalence, as well as inconsistencies among published studies regarding dementia prevalence in the EM region (Sharifi et al., 2014). Older adults in the EM are insufficiently studied, and no baseline data are available for dementia (Afgin et al., 2012; Almodeer et al., 2013; Abyad, 2015; Werner et al., 2015; Alaama, 2016).

It is essential that healthcare professionals become aware of the health intentions shared by people from different sociocultural, religious and linguistic backgrounds to deliver culturally sensitive care (Boughtwood et al., 2011; Alsenany & Alsaif, 2012; Yaghmour et al., 2016). There is a need for research on caregivers of people with dementia in the EM that uses qualitative methods to explore ethnic and cultural values and norms related to caring for people with dementia (Alsenany & Alsaif, 2014; Werner et al., 2015). In addition, it has been suggested that EM communities should work towards reducing illiteracy, raising awareness and developing and evaluating the education of health professionals and the community (Werner et al., 2015; Yaghmour et al., 2016). Many highlighted the demand for shedding light on the nature of dementia and its treatment and for the mobilisation of decision-makers to prioritise dementia awareness among the EM population (Eltallawy et al., 2013a; Werner et al., 2015).

As this review has shown, understanding the EM culture is highly recommended to help improve dementia care and to enhance older adults’ wellbeing (Sayegh et al., 2013; Alabed et al., 2014), and it is crucial to consider culture and social norms before introducing a new system or services (Almodeer et al., 2013).However, there is a high demand for the creation of an educational programme and policies to promote practical gerontological nursing and medicine (Alsenany & Alsaif, 2012; Sharifi et al., 2014; Alaama, 2016; Yaghmour et al., 2016).

**Conclusion**

Numerous studies indicated that dementia prevalence was higher amongst EM community, however, it is suggested that the prevalence was under-reported due to the absence of neurologists and gerontologists and lack of health professionals. While women show higher prevalence than men in experiencing dementia, however, high illiteracy with low-income was found among women in the region. Dementia among EM older adults was associated with at least two to four comorbidities such hypertension, cardiac problems and diabetes. That conversely accounted as risk factors for dementia along with stress, air and water pollution and genetic susceptibility. Additionally, older adult in EM community were cared by family members as introducing them to a care facility consider abandonment of a family duty. Restrictive social behaviours and cultural norms are influencing the care provided to people with dementia within the EM community. Therefore, people with dementia are not seeking for medical treatment from care facilities unless they have a recognisable physical illness. However, they are highly respected within the family and this is driven by Islamic values and believes. Nevertheless, dementia believed to be caused by fate, *Qadar* (God’s will), evil spirits and evil eye and sometimes deemed to be pathological. Furthermore, Authors declared that there is an issue in recognising dementia across EM region, many referred that to the lack of health professional personnel’s awareness, as well as, inadequate use of psychometric properties. Language barriers, high illiteracy rates amongst older adults and lack of training are considered obstacles in providing adequate care for people with dementia and treatment.

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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table 3 Summary of studies included in the review

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
|  | **Culture** |
| 1 | Abyad, (2014) | Review | - | - | Explore Alzheimer’s disease among Eastern-Mediterranean people | - EM population is aging- Older adults are source of high spiritual blessing, faith, and wisdom within the community - Strong family relations - High illiteracy among EM older adults and low technology oriented - Limited recourses and facilities available in the region to people with dementia | Good |
| 2 | Afgin et al. (2012)Wadi-Ara, Palestinian Occupied Territory | Quantitative observational study | - Clinical Dementia Rating Scale- Dementia: DSM-IV, ICD-10- Alzheimer:NINCDS-ADRDA- Parkinson’s: Gelb’s | N=944 age 65+ | Estimated the prevalence of AD, MCI and the risk of conversion to AD | - Arab shows significant higher prevalence of AD and MCI - Females’ prevalence of AD and MCI is higher than males- High illiteracy rate among study sample - The MCI epidemiology with high illiteracy rates are rarely reported- Confirm literature scars in Arab world- recommend not to use MMSE - MCI is more common than AD | Good |
| 3 | Alaama (2016)Jeddah, KSA | Quantitative Descriptive study | Self-developed questionnaire: geriatric knowledge assessment questionnaire | N=70 medical students | Assess the basic knowledge of medical trainees, in the absence of a structured geriatrics curriculum | - Dementia knowledge lacking among medical trainees- Introducing geriatric medicine into residency programme in early 2016- Older adults are expected to experience cognitive decline with normal aging, but not dementia as it is deemed to be pathological | Average |
| 4 | Alabed et al. (2013)Arab Australia | Systematic literature review | - | N= 8 studies  | Explore healthcare needs of older Arab migrants in Australia | - Arab do not visit hospitals as preventive care; Exclusively in hypertension, diabetes and hyperlipidaemia or other subtle conditions- Family members are discouraged in term of respecting, valuing, honouring and caring for older family members- Limited facilities were available in UAE, and in Egypt- Receiving care from a nonfamily member is shameful- The care is a family member’s duty- Usually older adults attend medical appointments with family member- families do not openly discuss end-of-life care and death issues- EM older adults’ views obtained by Islamic religion, faiths and traditional culture- EM attitude affected by cultural values when receiving care from nonfamily basis - Caring for a mental health family member experienced with anxiety, loss, fear, shame and ignominy of family character | Good |
| 5 | Alsenany and Alsaif (2012)Jeddah, KSA | Quantitative Descriptive study  | The Intent to Work with Older People questionnaire  | N=566 Saudi N=718 British | Explore the intentions of Saudi nursing students toward working with older people as baseline data for Saudi nursing students’ perspectives | - Older adults are taken care of in Saudi Arabia by their families- Saudi Arabia has few care facilities- Using nursing homes facilities are not accepted in the Saudi culture- Older adults care obtains in acute care settings when they need a nursing care- Nursing students assumed that caring for older adults is similar to the prominence of general nursing from acute care setting- Saudi students: establishing a nurse-client relationship with older adults is easier- Shortage in nursing specialist in SA and Limited research and high demand in develop education - Increase healthcare professionals awareness of different sociocultural, religious and linguistic backgrounds while delivering culturally sensitive health care- Nursing in SA was only established in the 1960s | Good |
| 6 | Alsenany and AlSaif (2014)Jeddah, KSA | Mixed-method study | 5 focused groups and survey | N=132 faculty members from 3 nursing schools | Explores nursing faculty members’ attitudes towards older people, and their thoughts about gerontological nursing education | - More gerontological content and clinical experience should applied to the nursing curriculum- Nursing students are deemed to deal with older adults with gratitude and respect- Older adults are spoken to with soft tune and not called by their names- Respect and restrict behaviours are encouraged when dealing with an older adult  | Good |

**Table 3.** Continued

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
| 7 | Amr et al. (2014)Hufof, KSA | Quantitative Population-based study | Clinical Dementia Rating scale, MMSE, Neuropsychiatric Inventory NPI, ADLs scoring. The Lawton IADL and DSM4 | N=53 people with dementia (39 Male, 14 Female) age 60+ | Evaluate the clinical and demographic profile among people with dementia in hospital setting  | - 96.2% illiterate - 12.9% the prevalence of dementia in the study- The co-morbidity rate is high 52.8% (hypertension 45.3%, Cardiac problem 30.2%, Diabetes 23.7%)- Female in eastern culture not attending hospitals frequently as men- Females are totally dependent on male and thought to be more tolerant of psychological and physical pain than western females- High respecting of elderly and extended family- Only few are living alone- Recommended to use MMSE and NPI to early detect dementia and neurocognitive impairment | Good |
| 8 | Bentwich et al. (2016)Galilee, Palestinian Occupied Territories | Mixed method study | semi-structured interviewsSelf-developed questionnaire | N= 20 Sabra n= 7, Arab n= 7, and Russian n= 6) caretaker | Explore the gap existence among caretakers from different ethno-cultural groups regarding their perceptions of autonomy and human dignity of patients with dementia | - Attitude toward dementia clients’ dignity and autonomy were differ significantly between Arabs and Russians- Arab caretakers raise covering conceptions of self-respect and independence, provides better grounds for person-cantered care in healthcare setting- Person-centred care for treating dementia clients consider the gold standard- Dementia awareness starts 1980s- Older adults’ dependency increases and their complexity rises as a result in deteriorating their autonomy and capability gradually - Conserve valuing older adults’ autonomy and human dignity | Good |
| 9 | Cipriani and Borin (2014)Arab | Literature review | - | - | Explore dementia phenomena in ethnically diverse groups and cultures | - EM community have difficulty to admit dementia- Stigma related to Arabic translation of dementia word- In Arabic dementia called “Kharaf” which means ‘unravelled’, ‘lost the mind’ that led to negative connotation in its understanding- The Oldest member is the heart of wisdom, love, and blessing - Fate “Qadar” assumed to be the cause of illnesses in EM believes | Average |
| 10 | Eltallawy, et al. (2013)El-Qaseir, Egypt | Sociodemographic study  | Self-developed questionnaire Diagnosed by neurologists WHO criteria | N=33,285 (Parkinson’s 8183 age 40+) | Study the prevalence of aged-related neurological disorders in AlQuseir City | - 3.83% among participants aged 60+ are experiencing dementia as a most common neurological disorder- Parkinson’s disorder prevalence was higher in comparison to worldwide cities - Cultural and social norms were affected on neurological disorders- Evil attach- Dementia in part of normal aging process- High demand on concrete projects and framework to illuminate and shed the light on the nature of these disorders and their suitability of treatment | Good |
| 11 | Eltallawy et al. (2013)El-Qaseir, Egypt | Epidemiological study | not hospital-based | N=33,285Age 40+ | Discover the prevalence of neurological disorders including dementia | - Females 5.2% higher than females- 15 neurological disorders were identified | Average |
| 12 | Esmayel, et al. (2013)Egypt | A cross-sectional study | Geriatric Depression Scale (GDS)MMSE | N= 200Hospitalised aged 60+ | Determined the prevalence of these problems and their associations with sociodemographic factors among hospitalized elderly in Egypt | - Depression and cognitive impairment are the most common mental health problems among geriatrics- 72% prevalence rate of depressive symptoms- 30% of cognitive impairment among medical inpatients- Significant relation between cognitive impairment and each depressive symptom were detected- Education level and low MMSE result are correlated | Good |

**Table 3.** Continued

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
| 13 | Halabi and Zafar (2010)UAE | Literature review | - | - | Review the care provided to older adults in UAE | - Disabled and vulnerable elderly cared by extended family- Geriatrics often surrounded by strong family relations; tribal- In case older adult need assistance families hire a caregiver - Inappropriate to refer a family member to a care facility- A stigma related to using a care home - Low number of gerontologists, while geriatric psychiatry almost not-exist- Lack of trained personnel in dementia care- No validated instruments available- MMSE not appropriate to the population- Dementia were determining on late stage and cared by a general practitioner - Consider culture and social norms before introducing a new system or services | Good |
| 14 | Okasha and Boutros (2010)Arab | Literature review | - | N= 6 papers | study papers published in Arab world concerning mental health and psychiatry  | - The stigma associated to mental health is decreasing- More psychiatric units were integrated to the hospitals and care facilities- Mental health treatment gap is high as most Arab population are dependence on traditional and religious healers, which form obstacles to pursue a medical treatment- Caused by Evil eye | Average |
| 15 | Sayegh et al. (2013)South Asian & Middle Eastern Americans, USA | Literature review | - | - | Discuss topics associated with dementia and mood and anxiety disorders among South Asian and Middle Eastern American older adults | - Noted the gap in researches conducted in EM community that investigate the prevalence of dementia, mood and anxiety disorders among older adults- Language barriers and lack of verified assessment instrument consider issues in recognising and treating dementia- A problem in translating and uses of culturally accepted terminology- Older adults supported emotionally and socially by their families- Seeking advice from outside the family boarder consider is untrustworthiness - Evil spirit was attributed these illnesses- EM health professionals are including Arabic versions of the shortened Geriatric Mental State Interview as assessment of dementia- validity of MMSE and the Informant Questionnaire on Cognitive Decline in Elderly- In gulf region people are seeking medical support rather late as commonly acknowledged that forming a cognitive deficit is a part of normal aging- EMs are seeking help in the moderate and sever stages as they tend to report emotional and behavioural problems rather than memory- Recommended to use MMSE for educated older adults- It is highly recommended to understand EM culture to help in dementia care | Good |
| 16 | Spalter, et al. (2014) Palestinian Occupied Territories | Longitudinal study 2005-2010 | Survey of Health and Retirement (SHARE) | N=982 Age 60+ | Examine the functional changes in late life in mobility, movement, activities of daily living | - Older adults living with other than spouse having higher number of diseases and comorbidity- Physical functioning can improve and decline with ageing - ADLs is a key indicator of QoL and wellbeing- Educate homecare workers and families to enhance the QoL of the elderly | Good |
|  | **Prevalence, comorbidity, and gender** |
| 17 | Alhawiti et al. (2016)Tabuk, KSA | Historical cohort longitudinal study | Patients’ records  | N=313Age 50+ | Identify the specific risk factors of dementia and Alzheimer's disease | - Diabetes, Hypertension, vascular disorders as a risk factor as these chronic illnesses plays a significant role in dementia development and prognosis, that maximise the risk of earlier onset dementia- Participants with multiple risk factors are experiencing earlier onset dementia - Include Alzheimer’s disease, Dementia with Lewy Bodies, Fronto-temporal dementia, and vascular dementia- Females more than males in term of risk factors  | Average |

**Table 3.** Continued

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
| 18 | Almodeer et al., (2013)Southern, KSA | Quantitative Descriptive study | Hospital based data | N=880Age 60+ | Determine the morbidity profile in home health care among older adults registered at one hospital in KSA | - Comorbidity is common in the study’s sample - 16.5% of older adults have two chronic illnesses- 22% are experiencing three chronic illnesses- 51% have four or more illnesses- Hypertension (59.1%), diabetes mellitus (57.3%), stroke (34.9%), dementia (28.5%), osteoarthritis (24.2%) and Alzheimer (21.4%)- Females are at higher risks of having many types elderly diseases- The highest risk was for obesity, then osteoporosis and fracture neck. In addition, females were also at higher risks of having Osteoarthritis and thyroid disorder, males are more susceptible to hypertension, stroke and renal diseases- No baseline data available on elderly’s chronic diseases- There is a need for developing a beneficial preventing and rehabilitating programme toward improving the quality of life among older adults | Average |
| 19 | Almomani, et al. (2016)Jordan | Quantitative study | the Arabic versions of the Tinetti assessment battery (TAB) for gait and balance, mini–mental state examination, and disability of arm, shoulder, and hand assessment test | N=221 nursing home residents in Jordanage 18-100 | Investigate the effects of physical, mental, and cognitive disabilities on gait and balance deficits among nursing home residents with different diseases in Jordan and also to find the risk of fall associated with or without these diseases | - Sever demented clients were excluded (11.7% from n=290)- Severe gait and balance deficits were found in younger adults (55 years) who had mental or physical health problems- Psychiatric disorders (including dementia) and cognitive impairments are related to fall risk balance and gait deficit- Cognitive impairment, dementia & Alzheimer are prevalent in older adults (70+)  | Good |
| 20 | Ayalon et al. (2010) Palestinian Occupied Territories | Mixed-method Cross-sectional study  |  SHAREface-to-face interviews | N=2492 (8.7% Arab)Age 50+ | evaluates population group differences in the cognitive functioning of Israelis 50 years and older | - A little less than the half have shown impaired performance on the task of word learning- More than half of participates have shown impairment on the mathematic tasks, verbal recall task and word fluency task- Approximately half of the study sample experience impaired reading and writing abilities- More education in Arab population is needed | Good |
| 21 | Boulos et al. (2013)Lebanon  | Mixed-method Cross-sectional study  | MMSE, GDS-5 | N=1200 Age 65+cluster sampling in rural setting | Assess the nutritional status of community dwelling elderly people living in a rural settings in Lebanon, in line of socioeconomic factors, health and living conditions | - Significant differences between gender- Females are significantly higher than males in illiteracy level and poor income, which are associated with chronic illnesses, poor self-perceived health, fragility and functional disability- Females are higher than males in the prevalence of depressive symptoms and cognitive impairment | Average |
| 22 | Dallo et al. (2015)Michigan, USA | Quantitative Descriptive study | Hospital based data | N=68,047 (5399 Arab American)Age 18+attending a large, metropolitan hospital system | Estimate and compare Alzheimer’s disease and other disorders prevalence between Arab Americans and white Americans | - a comparison between Arab Americans and white Americans in the study but shows no significant differences in experiencing AD- Men: Arab American have higher prevalence rate of diabetes and hypertension than white Americans significantly, lower chronic lower respiratory disease- Women: higher in chronic lower respiratory disease, diabetes, influenza/pneumonia and hypertension- Arab are under-studied group in the USA and international | Good |
| 23 | Elshahidi et al. (2017) | Systematic review | Databases  | N=6 studies | Summarise the current evidence available regarding dementia prevalence in Egypt | - Prevalence of dementia was vary among studies (2.01%-5.07%)- Dementia is increased with age- Females were affected with dementia more than males- Males 80+ are higher than females - Dementia is higher prevalence among illiterate older adults  | Good |

**Table 3.** Continued

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| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
| 24 | Ghubach et al. (2010)UAE | Qualitative | Interviews using Geriatric Mental State Interview (GMS-A3) | N=610 age 60+ | examine the relationships of psychiatric disorders and physical disorders on life satisfaction among Arab older adults in general population | - 20.2% were diagnosed with depression, 5.6% have anxiety, 4.4% hypochondriasis and 3.6% have organic brain syndrome with or without dementia- Having depressive disorder significantly associated with less life satisfaction- Decreased life satisfaction was significantly accompanying with anxiety, hypochondriacal disorders, and organic brain syndrome- 48% of older adults in the study were not satisfied with their lives - Amongst participants above 85, the level of life satisfaction was significantly low, as well as with the participants who are living alone or with only spouse | Good |
| 25 | Khan et al. (2013)Riyadh, KSA | Mixed-method study  | Interviews, BMI, Mini Nutritional AssessmentStudy investigate the BMI and nutrition status and its relation to psychological problems in AD’s clients | N=63 Saudis above 60-year-old | Assess the nutritional status of a small number of Alzheimer’s patients living in Saudi Arabia and evaluate the risk of malnutrition associated with this disease | - 38% of participant with good nutrition are less likely to develop Ads- Almost all participant with ADs have malnutrition or risk of malnutrition - Scar in data regarding dementia in Saudi Arabia in particular, and in the Middle East in general- disease recognition plays an important role in slowing its progression | Good |
| 26 | Khedr et al. (2015)Qena, Egypt | Quantitative Cross-sectional study | The uniﬁed Parkinson disease rating scale (UPDRS), mini-mental state examination (MMSE) and the non-motor symptoms scale (NMSS) | N=44 with Parkinson’s disease | Provide evidence for the prevalence rate of PD in Egypt | - High PD prevalence in north Egypt- 14.3% of participants had mild dementia- Environmental risk factors; air and water pollution and genetic susceptibility- Promote longitudinal studies and risk factors investigation are needed in future studies | Good |
| 27 | Parlevliet et al. (2016)Netherland | Quantitative Cross-sectional study | population basedSystematic Memory Testing Beholding Other Languages study, omprehensive geriatric assessment and cognitive testing using the CCD screening, EuroQoL, Informant Questionnaire for Cognitive Decline | Age 55+  | determine the MCI and dementia prevalence in older community-dwelling adults from the largest non-western immigrant groups in the Netherland | - Higher prevalence in compression with western citizens in MCI and dementia (3 or 4 times more than native Dutch (14.8% in Turkish, 12.2% in Moroccan Arabic, 11.3% in Moroccan Berber and 12.6% in Surinamese–Hindustani participants, compared to 4.0% in Surinamese–Creoles and 3.5% in native Dutch)- In immigrants, the higher prevalence of dementia was associated with higher prevalence of vascular risk factors and psychiatric disorders such depression | Good |
| 28 | Werner et al. (2015)Palestinian occupied territories  | Literature review  | Ethnic differences in epidemiologic and risk factors for Alzheimer’s disease, including genetic differences as well as disparities in health access and quality of health services. | - | Describe ethnic differences in prevalence and risk factors for Alzheimer’s disease. | - Participant with age 60+ have four times higher prevalence than non-Arab who are 75+ living in the same area using similar diagnostic tools- Illiteracy and education are strongly associated with prevalence of AD - Arab population is higher than in population with similar literacy and educational profile- Few studies strong association between education and prevalence of dementia- High prevalence of cognitive impairment - Differences in testing methods may be responsible for the variable results- Dementia is associated with older-age, female gender, lower education | Good |
|  | **Recognition and Tools** |
| 29 | Goudsmit et al. (2016)Netherland | Quantitative Cross-sectional study | Cross-Cultural Dementia screening CCD  | N=1625 (173 Moroccan-Arabic) 55+ old | Test the validity of newly developed Cross-Cultural Dementia Screening (CCD)  | - A cross cultural dementia screening test is a neuropsychological instrument for dementia screening for low-educated immigrant population that is sensitive and culture-fair tool- It is valid tool to predict dementia among 1625 participants in Netherland who are illiterate, low-educated, different culture or have languages barriers- Immigrants are minor ethnicity in host countries, with limited knowledge regarding host country culture and language, as well as many were illiterate or have low education level, Which result lower MMSE score- Recommended tool to use in memory clinics with standard multidisciplinary diagnostic checks | Good |

**Table 3.** Continued

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| --- | --- | --- | --- | --- | --- | --- | --- |
| # | Study | Design | Tool | Sample | Aim/question | Key findings | Quality rating |
| 30 | Uysal-Bozkir et al. (2013)Arab, Turkish, Surinamese | Systematic literature review | - | N=68 articles (31 cognition, 24 mood, 23 QoL, 1 loneliness, 21 ADL) 65+ | Assess the quality of the cross-cultural adaptations and the psychometric properties of health assessment scales measuring cognition, mood, activities of daily living, health-related quality of life, and loneliness | - Insufﬁcient Cross-cultural versions with unknown psychometric properties for several converted health assessment instruments.- Most frequent used assessments were:\* Cognition: Some studies used dementia diagnosis according to (DSM-IV) classiﬁcation as their gold standard. The Mini-Mental State Examination (MMSE) and Alzheimer’s Disease Assessment Scale been used more frequently\* Mood: the Geriatric Depression Scale (GDS), Hamilton Depression Rating Scale (HDRS), Centre for Epidemiologic Depression Scale (CES-D), and Hospital Anxiety and Depression Scale (HADS)\* Loneliness the self-report University of California, Los Angeles, Loneliness Scale\* ADL: the Barthel index (BI) and Functional Independence Measure (FIM). \* QoL: Short Form 36 Health Survey (SF-36)-EM countries faces a challenge to evaluate the psychometric properties as a result of lacking in cross-cultural high-standard adapted assessment instruments while the using instruments consider a mediocre in most cases | Good |
|  | **Healthcare Workers** |
| 31 | Boughtwood, et al. (2011)Arab, Australia | Qualitative study- grounded theory | Focused group | N=121 family carers (19 Arab) | Examining family caregiving for dementia in CALD communities in Australia | - All communities were heavily involved in the care- EM families were the most sensitive, while much emotions showed along with grief and anxiety about living with dementia person- In regard to dementia-related behaviours, EM carers were the least concerned about- Arabic-speaking carers were less encouragement role in hospitals- Arabic-speaking and Chinese-speaking carers may not have discussed gender as impacting caregiving, but this may have been due to an uncritical acceptance that family members of a certain gender provide care | Good |
| 32 | Sharifi et al. (2014)Iran | Review  | estimate dementia burden over 24 yearsEstimate dementia prevalence by age and sex (from literature and dementia drug sale, inpatients). calculating the dementia burden using DALYS, YLL, YLD | - | Explain the systematic approach, data sources, research methodology, and statistical analysis that will be used to quantify the prevalence and burden of dementia at national and sub-national levels | - Lack of published data of dementia incidence and prevalence- Inconsistency in published studies in term of dementia prevalence and burden around Iran- indicate the important of periodic burden of dementia estimation nationally and regionally that help in making better decisions by policymakers | Good |
| 33 | Yaghmour et al. (2016)Jeddah, KSA | Quantitative Cross-sectional study | Dementia Knowledge Assessment questionnaire  | N=265 Registered nurses | Explore nurses’ Dementia depression and delirium knowledge in Saudi Arabia | - Nurses acknowledge the need of increasing dementia’s training to enhance their knowledge- Dementia and delirium knowledge lacking among Saudi nurses | Good |

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