Dementia and the aging population: cognitive screening within correctional health

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Abstract

Purpose – *The purpose of this study was to examine the literature surrounding dementia in the aging correctional population and assess the role of cognitive screening related to dementia detection within corrections. The literature regarding the role of dementia within the justice continuum is scant. Furthermore, correctional health researchers have not reached a consensus on the best age to administer cognitive screening in older persons or prioritizes a screening tool for the early detection of dementia.*

Design/methodology/approach – *A key search term list including dementia screening and was developed to review the literature surrounding dementia and the aging correctional population. PubMed, Criminal Justice Abstracts (Ebsco) and the National Criminal Justice Reference Service were used within the academic search. A gray literature search using these same search terms was conducted reviewing criminal justice federal agencies and organizations for additional information on the dementia experience within correctional settings. Snowballing was used to capture relevant theoretical and empirical knowledge.*

Findings – *Shortages in aging specialized health-care staffing presents a barrier for the clinical interpretation of Montreal Cognitive Assessment (MoCA) results. Correctional officers are also identified as useful candidates within the administration of cognitive screening with proper training. The MoCA may be the optimal cognitive screening tool for dementia, until an original cognitive screening tool is created specific to the correctional population. An age of 55 years or older may serve as the best cutoff score for classifying incarcerated individuals as older persons, and screening should be prioritized for these individuals. Finally, new specialized programs related to dementia within correctional settings are identified.*

Research limitations/implications – *A limitation of this research is the conflicting opinions among researchers regarding the use of general cognitive screening tools within the correctional setting.*

Originality/value – *This research can inform correctional organizational policy and practices regarding the screening of older persons suspected of dementia. Most notably, this research proposes that correctional settings should incorporate the MoCA within initial screening of all individuals 55 years of age or older, enriching the job design of correctional officer's job positions to include cognitive testing, and for correctional settings to provide dementia and age-associated training for correctional officers. Finally, this paper informs future research in the development of a cognitive assessment tool specific to the correctional population.*

Keywords *Dementia, Alzheimer's disease, Correctional health care, Jail, Prison, Screening, MoCA*

Paper type *General review*

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Introduction

Aging health scholars and practitioners are presently servicing an expeditiously aging global population. In 2020, the global population of individuals aged 65 or over was estimated to be 962 million people. This number has at least doubled since 1980 when the global projection for older persons was only 382 million people (United Nations, 2020). The

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United Nations (2017) predicts that by 2050, children under the age of 10 globally will be outnumbered by older persons. As the population of older persons increases, attention must be given to the cognitive and behavioral needs of these individuals, especially in regard to aging-related cognitive impairment and neurodegenerative diseases such as dementia.

According to the World Health Organization (2021), there are approximately 55 million people living with dementia around the world, and this number is expected to rise to 78 million by 2030. In the European Union, it is estimated that there are 9.1 million people over the age of 60 living with dementia (OECD/European Union, 2018). In the United States, there are over six million people living with dementia (Alzheimer's Association, 2021). The Mayo Clinic projects that the number of individuals with dementia will triple by 2050 (Graff-Radford and Lunde, 2020). When considering the cognitive health of various groups, attention should also be drawn to the rapidly aging correctional population.

As of 2015, correctional systems in the USA house over 21% of the world's incarcerated individuals (Walmsley, 2021). In 2017, older persons attributed to more than 20% of the individuals housed within US federal or state correctional settings (Bronson and Carson, 2019). In England and Wales, the percentage of the adult prison population over 50 has increased from 7% in 2002 to 16% in 2018 (Sturge, 2019). While older persons do not constitute the majority of correctional populations, these individuals might require more health-care costs disproportionately to younger individuals (Williams *et al.*, 2012). Incarcerated older adults account for $16bn in annual correctional spending, and the estimated cost of caring for someone over the age of 50 is more than twice that of caring for someone under 50 ($68,270 vs $34,135) (The Osborne Association, 2018). In some cases, the cost of care for older persons with complex medical and psychological needs is more than five times the amount of caring for a younger person (The Osborne Association, 2018). Related to the cognitive health of incarcerated individuals, a recent study by Maruschak *et al.* (2021) presented evidence showing a 49% prevalence rate of self-reported cognitive disability among incarcerated individuals in US prisons 55 years of age or older. At HMP Bronzefield (a prison in England), a pilot cognitive screening of the correctional population over 55 resulted in a quarter of the sample receiving a first-time provisional dementia diagnosis (Chao, 2019). Fazel and Benning (2006) highlighted that screening is a necessary tool for the effective treatment of diseases in correctional settings. These findings show a clear need to investigate, and apply preventative measures regarding, the cognitive health of older persons in correctional settings.

Dementia is an umbrella term that captures an extensive group of neurodegenerative diseases hallmarked by the progressive deterioration in cognitive abilities (Prince *et al.*, 2013). The most common forms of dementia are Alzheimer's disease, frontotemporal dementia, vascular dementia and Lewy body dementia (National Institute on Aging, 2021). The symptomatology and decline of individuals with dementia are largely individualistic to the person (Bianchetti *et al.*, 2020), but some common signs of the various types of dementia do exist. According to Cerejeira *et al.* (2012), symptoms of Alzheimer's disease include increased memory loss and confusion; wandering and becoming lost; and trouble with organizing thoughts and logical thinking. Individuals with vascular dementia have less noticeable memory loss but greater difficulties with problem-solving, slowed thinking and loss of focus and organization. Those with Lewy body dementia may experience visual hallucinations; trouble focusing and paying attention; and uncoordinated and/or slow movement including tremors. Frontotemporal dementia has been associated with criminal behaviors due to symptoms impacting the individual's behavior, personality, thinking and judgment (Cerejeira *et al.*, 2012). While the dementia experience may be unique to individuals, several cognitive and noncognitive, or behavioral and psychological symptoms of dementia (BPSD), symptoms of dementia have been identified. Cognitive symptoms of dementia include memory loss; confusion and disorientation; and difficulty with

communication, visuospatial abilities, psychomotor coordination and reasoning. Common BPSD include anxiety, depression, paranoia, hallucinations, personality changes and socially inappropriate behaviors (Graff-Radford and Lunde, 2020).

The pathology and symptomology of dementia plays a critical role when assessing cognition in the lens of criminal responsibility (Liljegren *et al.*, 2015). Individuals with Alzheimer's are known to have the most police interaction from wandering whereas individuals with frontotemporal dementia often exhibit more BPSD, which may be interpreted as aggression or violence toward others (Liljegren *et al.*, 2018; Sun *et al.*, 2019). These behaviors were even observed within individuals without a history of justice involvement. Individuals with frontotemporal dementia may have considerable issues with impulse control, which may cause them to carry out a crime despite often possessing the cognitive capacity to deem an action as illegal (Mendez, 2010; Sfera *et al.*, 2014).

The purpose of this research is to provide an overview of dementia and justice involvement, and cognitive screening. Throughout this literature review, dementia across the justice continuum is discussed along with some of the known modifiable and nonmodifiable factors impacting dementia within corrections including race and the socio-physical environment of correctional settings. Additionally, we propose use of the Montreal Cognitive Assessment (MoCA) as a cognitive screening tool for justice-involved individuals over the age of 55, and relevant factors needed for the administration including optimal screening points, support for 55 serving as an appropriate age for screening in correctional settings, and implications for staffing and training. Finally, approaches to better cater to the health of the aging correctional population are provided. It should be noted that this paper is not about competency testing, but focuses on a pure assessment of global cognition.

Methods

Articles and journals were identified using keywords including those relating to dementia and correctional health. Greater priority was given to resources that included prevalence data on older adults and/or dementia in correctional settings and used the MoCA as a screening tool in correctional settings. Searches were completed in PubMed and PsycINFO. Snowballing and expert outreach was also used to expand on the initial low search results, and increase the number of studies completed outside of the USA.

Dementia and justice-contact

Currently, the research is scant regarding community services for early diversion of individuals with dementia from justice-involvement. Dementia-induced behaviors have been cited as a cause for the primary arrest and adjudication of older persons (Miller, 2016). Violent offenses accounted for the largest percentage (30.5%) of primary, or first-time, serious offenses committed by older persons. The other 70% of crimes within the study were mostly represented by property offenses (22%), assault (22%), sexual assault or rape (12.8%) and murder (2.8%) (The Bureau of Justice Statistics, 2016). Law enforcement officers are often the first responders to dementia-related calls, but usually do not receive observational and interactional training on how best to engage with individuals with dementia (Felix-Ortiz *et al.*, 2021; Vogel, 2016), and their sometimes unpredictable behaviors. When present, dementia training was normally incorporated into existing training curriculum, such as critical incident training programs. Even with training, Sun *et al.* (2019) highlighted that some officers feel as though material learned within training is not transferable to daily encounters.

When considering dementia in the context of arrests and adjudication, it is important to highlight that this stage is a critical point for diversion of individuals with dementia. The crux of the matter is that correctional facilities are not ideal for older adults, especially those with dementia. These individuals should be placed in care settings that are staffed for their

unique health needs. Depending on the initial assessment, proper triage should begin as soon as possible. Extra consideration should be given in regard to the ability to restore competency in cases where successful restoration is known, as with substance abuse- or HIV-induced dementia as corrective treatment for the underlying prognosis (e.g. unmanaged substance abuse and viral load) have been shown to improve or reverse symptoms of dementia (Ekstrom *et al.*, 2017).

When an individual enters the criminal justice system with suspected dementia, immediate questions should arise regarding their competence. The competency of an individual to stand trial presents a complex set of psycholegal questions. Most central to this paper are the points that clinicians should evaluate concerns of competency as soon as possible for diversion to civil commitment or release, and in certain cases, individuals can be restored to competency. Competency is defined in various manners, but evaluation is rooted in determining if an individual's mental disorder or disability prohibits them from fully comprehending the criminal proceedings and being able to assist in their own defense (Bartos *et al.*, 2017). Because a recognized diagnosis of dementia disorder does not guarantee release from a correctional facility, individuals with dementia must be triaged to the most appropriate level of care equipped with the necessary measures for providing comprehensive examinations (Morris and Parker, 2009). Although the length of time needed to restore competency in individuals with dementia is notably longer (231.3 days) than their peers without dementia, a study by Bartos *et al.* (2017) showed that 94% of their sample had been restored within three years.

While competency evaluation can be considered a screening measure, we do not adopt competency evaluations within the definition of screening tools for this research. Competency evaluations, similar to neuropsychological evaluations, are comprehensive in nature and more involved than an initial cognitive screening. It is worth mentioning that tests of legal insanity (e.g. the M'Naghten and American Law Institute [ALI] tests) may produce different outcomes for individuals with dementia. While both tests evaluate an individual's ability to assess the wrongfulness of their crime, the ALI test also assesses the role of behavioral conformity and mental functionality in the actions of a crime (American Law Institute, 1962). The increased sensitivity to mental functionality and conformity within the ALI. test means that individuals with frontotemporal dementia may be more likely to qualify as legally insane (Berryessa, 2016). The M'Naghten largely prevents individuals with frontotemporal from using an insanity defense due to the individual's ability to make distinctions from legal and illegal actions (Mendez, 2010; Sfera *et al.*, 2014; Zeki *et al.*, 2004).

Although there is some prevalence data on the number of incarcerated individuals with mental illness, there is no reporting on the number of incarcerated individuals with dementia. To help establish prevalence data, researchers have supported the argument for cognitive screening early in justice involvement (Peacock *et al.*, 2020). A study by Garavito (2019) advances the notion that preventative health measures are not adequately explored or implemented for individuals with dementia within correctional settings. It is known that the symptomatology of dementia can make this population susceptible to targets of victimization, increased falls and variable physical and emotional well-being within the correctional setting (Davies, 2011; Moll, 2013; Garavito, 2019). These findings showcase the need for aging research in correctional health settings.

Risk factors for dementia

Several factors can prove stressful for incarcerated individuals with dementia including extreme heat (air conditioning is not a requirement for all correctional facilities), increased exposure to violence and inadequate healthcare standards (Maschi *et al.*, 2012; Terwiel, 2018). These social and environmental factors are considered nonmodifiable risk factors because of the lack of control these individuals have in modifying these variables. The

considerably low autonomy incarcerated individuals often have in determining their environmental control measures may directly impact their health and treatment. Another salient nonmodifiable risk factor in dementia is race.

Relative to the aging overrepresented black population in correctional settings, the relationship between race and risk of dementia was noted in several reports and studies (The Alzheimer's Association, 2002, 2021; Barnes and Bennett, 2014; Barry, 2018; Mehta and Yeo, 2017). Black people are nearly twice as likely to develop dementia when compared with their white counterparts (Alzheimer's Association, 2021). Additionally, the first-degree relatives of black people suffering from Alzheimer's disease have a 43.7% cumulative risk of dementia (Alzheimer's Association, 2002). There is also concern related to the impact of genetic and environmental health factors associated with the development of dementias within Black people before incarceration (Barnes & Barnett, 2014). Several of these environmental factors are embedded within the domains of the social determinants of health model, and include health and nutrition (especially in regard to cardiovascular health and maintenance), education and neighborhood and environment (Chin *et al.*, 2012; Hall *et al.*, 2000; Hossain *et al.*, 2019). Understanding the risk factors associated with the development of dementia in black people may better improve racial disparities of health found within this population. Additionally, preliminary dementia screening in black adults may allow for earlier detection of cognitive impairment, prompting treatment of the disease or symptoms the individual is suffering.

Some modifiable risk factors associated with dementia are diet and exercise, cardiovascular health, substance use and education level (Barnes and Bennett, 2014). Barnes and Bennett (2014) showcased the risk factors that decrease the risk of cognitive decline including increased cognitive activity, social engagement and networks, vitamin E levels, fruit and vegetable consumption and a higher body mass index. While the research surrounding nonmodifiable risk factors is more clear, modifiable risk factors present a unique opportunity where determinants of dementia can be influenced, and potentially reversed (see Ekstrom *et al.*, 2017). We remain concerned that the high security and control measures placed on individuals within correctional settings may serve as a barrier to active engagement in healthier cognitive, or noncognition oriented, lifestyles, which plays a role in the potential modification of dementia risk.

Finally, individuals with a previous traumatic brain injury (TBI) were shown to have increased risk of developing dementia within numerous studies (Pattinson and Gill, 2018; Shively *et al.*, 2012; Wang *et al.*, 2012). In a study assessing risk of dementia after TBI, Gardner *et al.* (2014) revealed the risk of dementia development increased in older persons with a history of TBI. A study at the Denver County Jail Mental Health found a 96% prevalence rate of at least one complicated TBI within their sample (Gur *et al.*, 2016). These findings may have implications for special correctional populations, such as veterans, who may have a higher likelihood of experiencing a TBI (Barnes *et al.*, 2014). Williams *et al.* (2012) presented a strong need for the annual assessment of dementia among individuals in correctional facilities aged over 55 with a history of TBI.

Screening and testing of dementia

The aging of older persons within, or entering, correctional settings place an importance in the decision to screen for cognitive deficits. Early cognitive screening in aging adults provides clinicians with a baseline score of cognitive functionality. The establishment of a baseline score allows for comparative and longitudinal analyses (e.g. booking and pre-release) assessing the effectiveness of interventions. Without quantitative evidence able to support the progression or improvement of dementia, clinicians are often left with a critical data gap for making important treatment decisions. Additionally, the failure to properly assess progressive diseases early within their cycle may prove more difficult and costly to treat at a later time. Thus, the proper screening and assessment of older persons with suspected dementia-related symptoms is a necessary step in determining the most appropriate clinical intervention.

Screening tools

Currently, there is no designated tool for the screening of suspected individuals with dementia within a correctional setting. However, various screening and assessments tools have been developed to measure cognitive functionality in general population within the community setting. The rigor of these tests is largely based on the number of dimensions measuring cognitive functionality and sensitivity in responses to detecting various forms of dementia. For the purposes of initial or routine cognitive screening, there is a large body of support surrounding the use of the Mini-Mental Status Exam (MMSE) and MoCA. The MMSE and MoCA test cognitive abilities through the completion of tasks related to orientation, attention, memory, language and visuospatial skills, but the MoCA has additional tasks to examine cued recall, recognition, abstract thinking and trail making. These additional tasks provide clinical insights for assessing an individual's spatial dysfunction and neglect, visual search speed, processing speed, mental flexibility and executive functioning, ultimately useful in distinguishing mild–moderate cognitive impairments.

In a meta-analysis comparing the MMSE and MoCA, Ciesielska *et al.* (2016) favored the MoCA over the MMSE in the tests' ability to detect cognitive impairment in older adults. Even when the MMSE has been used in conjunction with other screening tools, such as the Informant Questionnaire on Cognitive Decline in the Elderly, the MoCA has been considered as having better clinical accuracy in screening for dementia (Larner, 2012). Additionally, the MMSE has been criticized for providing false negatives related to cognitive impairments, that is the MMSE has failed to detect nonoptimal cognitive functioning in impaired individuals (Aggarwal and Kean, 2010). Pendlebury *et al.* (2012) noticed differences between cognitive profile scores within individual MoCA assessments, whereas those same individuals had normal MMSE scores. In a study of patients with vascular cognitive impairment, the MoCA was found to be more precise in the measurement of visuospatial and executive functioning skills (Dong *et al.*, 2010). The MoCA may be a better tool when screening for dementias with underlying vascular pathologies, while also being able to detect mild cognitive impairments. Several researchers have mentioned the MoCA as the most promising cognitive screening tool for the initial assessment of cognitive related impairments in individuals with dementia due to its sensitivity in detecting more subtle cognitive defects than the MMSE (Aggarwal and Kean, 2010; Dong *et al.*, 2010; De Roeck *et al.*, 2019; Freitas *et al.*, 2012; Hoops *et al.*, 2009). The MoCA has also been validated in correctional samples, and has been linked to important correctional health outcomes. In a study analyzing cross-sectional and longitudinal data from 310 individuals in jail aged 55 or older, Ahalt *et al.* (2018) reported that 70% of the participants scored lower than a 25 on the MOCA. Additionally, during a six-month period, individuals with a MoCA score less than 25 were more likely to have more emergency department visits (32% vs 13%, $p = 0.02$) and hospitalizations (35% vs 16%, $p = 0.03$) than those with scores above 25.

The MoCA can be administered by a correctional officer in 10 min, or shorter if using the short form of the MoCA (SF-MoCA), which is the abridged version. In a study comparing the recently developed SF-MOCA to the original MoCA, the SF-MoCA was shown to have a 72.6% classification accuracy (Horton *et al.*, 2015). Although this paper suggests the MoCA as a suggestive tool for standardizing the cognitive screening process across correctional settings, researchers have suggested that cognitive screening tools may have increased sensitivity to low literacy and education levels (Williams *et al.*, 2012; Dulisse *et al.*, 2020), which are commonly seen within incarcerated individuals. However, several studies have justified the use of the MoCA as an appropriate and reliable tool for the cognitive screening of individuals within the correctional settings (*Ahalt et al.*, 2018; Barry, 2018; Perez *et al.*, 2021).

Administrator and clinical assessor

A benefit of prioritizing the MoCA as the preferred cognitive screening tool is the high variety of individuals who can administer the test. A division of labor can be found in the administration

and assessment of MoCA. This means that the individual who administers the MoCA does not have to be the same person who interprets the results. Within this paper, we will refer to the individual who is administering the test as the *administrator*. The clinician who provides an interpretative analysis of the cognitive findings will be referenced as the *assessor*.

The administration of the MoCA is a nonclinical procedure, with clinical implications. This means that the administrator can have a nonclinician status and still provide testing services. Correctional officers are an example of a potential administrator. Correctional officers often provide frontline screening within the admissions process, and could be trained to administer cognitive screening (Moll, 2013). Megargee (1995) highlighted that correctional staff can be adequately trained to administer tests or assessments, which advances the knowledge and skillset of existing employees. While a non-clinical administrator should never provide a diagnostic assessment of an individual's score, such as giving a formal diagnosis, they can contribute valuable subclinical observational information from interaction and engagement during the screening process. For example, an administrator might notice that an individual exhibits extreme aggression or mood instability during the screening process, which may show valuable subclinical insight useful in a frontotemporal dementia diagnosis (Dubljevic, 2020). This information may later be useful to the clinician in the development of a treatment plan of an individual, which may include the completion of a more comprehensive cognitive examination by a certified clinician. Recently, certification showing the completion of MoCA training has recently been a preferred status for administrators. Individuals who have not completed the MoCA training for certification must disclaim this non-certified status and then can administer the test.

Several clinicians may be trained in the interpretation of the MoCA to serve as the assessor. The most suited clinical assessors would possess unique training within the intersection of geriatric and psychological health assessment. Three notable job positions with this highly specialized training are neurogeriatricians, geriatric psychiatrists and geriatric neuropsychologists. There are 1,265 licensed geriatric psychiatrists within the USA, and more than half of these specialized professionals are located within only seven states (CA, FL, MA, NJ, NY, PA and TX) (Beck *et al.*, 2018). There is no information related to the number of practicing neurogeriatricians or geriatric neuropsychologists within the USA or Europe. Although no information is readily available to report the number of neuropsychologists with the geriatric subspecialty, we are currently aware of 1,399 board certified neuropsychologists (American Board of Professional Psychology, 2020). The shortage of these positions in the general populations suggests that these clinicians may not be adequately staffed in correctional settings. The large shortage of clinical assessors suggests the need for cognitive training related to individuals with dementia and enriching the job design of other job positions within correctional settings able to serve as administrators. Correctional health staff should include clinicians that could be trained to serve as both the administrator and assessor of test screens for dementia. General physicians, psychologists and clinical social workers possess an adequate clinical knowledge base to interpret the results of the MoCA. This population of clinicians, if already providing services within correctional settings, are also more familiar with the health psychology associated with the incarceration experience in older adults.

Screening points

The time at which a cognitive test is administered is important in establishing the most appropriate diversion options for individuals with dementia. Several researchers suggest that cognitive screening should be performed upon initial justice contact in individuals over the age of 55 (Sefra *et al.*, 2014; Williams *et al.*, 2012). The early detection of dementia also awards clinicians more time to provide corrective action in cases where symptoms of dementia are reversible, or provide the best treatment to slow progression of the disease. If a dementia diagnosis is unknown before the time of arrest, often the earliest time clinicians may become aware of the need to provide dementia-related screening is during criminal

justice proceedings. In older persons, this may be an opportunity to establish baseline scoring related to cognitive functionality; additionally, the MoCA can be administered at numerous intercepts within the justice experience. For example, a correctional officer may administer the MoCA during the admissions process and readminister the test before community reentry. Differences in these scores may inform treatment plans while incarcerated while providing community providers with a better detailing of changes in cognitive functionality throughout the incarceration experience, and how to actively engage in treatment with the patient at their current level of cognitive functionality.

Screening age

A consensus has not been reached among correctional health and aging researchers regarding the age at which an individual should be considered an older person within corrections. In community settings, the generally accepted cutoff age for older persons is 65 years of age and older. Previous reporting on aging within corrections data from the United States Bureau of Justice Statistics have used 55 years of age as the cutoff score for categorizing an individual as an older person within corrections (Carson and Sabol, 2016). Correctional health and aging researchers in the USA and UK suggest a cutoff age between 50 and 55 for classifying older adults in correctional settings because the environmental stressors of correctional environments combined with previous lifestyle habits may accelerate the aging process (Enggist *et al.*, 2020; Munday *et al.*, 2014; Purewal, 2020; Sefra *et al.*, 2014; Williams *et al.*, 2012). This presents a difference in an individual's chronological and physiological age. Williams *et al.* (2012) shared insights into substance abuse and poor access to health-care services as possible factors attributing to differences in chronological and physiological age. A study by Dulisse *et al.* (2020) supported the notion that harsh environmental factors associated with the incarceration experience are contributing variables in the accelerated aging related to the health of incarcerated individuals. While this does not suffice as an empirical justification for 55 years of age as a cutoff age, this supports 55 as a cutoff age as the basis for future research and empirical studies analyzing older persons within correctional settings. To support the continuous efforts to reach a unanimous decision on the most appropriate age to classify older persons within correctional settings, this paper upholds 55 years of age as the cutoff score.

Training

Correctional security and health professionals must be provided with training to identify disinhibition and emotional shifts more easily in individuals with dementia as a separate experience from outbursts from incarcerated individuals without dementia. BPSD may present before memory loss, or overshadow other observational cognitive deficiencies, which may cause correctional staff to overlook the possibility of dementia (Williams *et al.*, 2012). Clinicians admit that the distinction of dementia symptomatology can be difficult and frontotemporal dementia can present similarly to psychosis or personality disorders (Sfera *et al.*, 2014). Since correctional officers often do not have health or clinical backgrounds, correctional leadership must prioritize aging training for their officers to better attend to the aging correctional population. In addition to cognitive screening training, other possible training topics include behavioral observational and crisis intervention training specific to older persons. Williams *et al.* (2012) highlighted the need to contextualize age-association conditions within the correctional setting. Familiarizing correctional officers with normative conditions associated with the aging, and progressive neurodegenerative, process may also assist in the proper triage of individuals in need of medical assessment.

New correctional advancements

Recently, specialized programs catered toward providing a physical and emotionally safe environment for individuals with dementia have been created across the USA. The Federal

Medical Center in Deven, Massachusetts, has operationalized a Memory Disorder Unit, which has adopted the nursing home memory care model for treatment of individuals with dementia (Bollinger *et al.*, 2019). All staff within the unit have completed dementia-related training, and have received certification to provide services to individuals with dementia. The additional step of certified training provides a much-needed additional layer of specialized support to this sensitive health population. The California Men's Colony in San Luis Obispo, California, also created a dementia unit where inmates with positive records are able to foster the development of healthy social skills and interactions with incarcerated individuals with dementia (Maschi *et al.*, 2012). California's Gold Coats program employs inmates with positive records to assist with care for individuals with dementia, upon the completion of a training program (Garavito, 2019).

While the novel presence of specialized programs provides support that correctional agencies are aware of the increased care level necessary for incarcerated individuals with dementia, issues remain for individuals reentering the community. Despite the presence of existing reentry strategies, such as compassionate release and medical parole, nursing homes and communities are hesitant to readily accept former incarcerated persons. The stigmatization of formerly incarcerated individuals, especially those charged with violent or sexual crimes, is a cited contribution to this barrier in care coordination (Mistry and Muhammad, 2015; Pro and Marzell, 2017). Additional funding opportunities centered around the placement of formerly incarcerated individuals with dementia may improve the care coordination of this population, as ineligibility for Medicare was cited as a setback for a nursing home in Connecticut originally designed for formerly incarcerated individuals (Garavito, 2019). Although recidivism remains a concern for most community leaders, recidivism research from Pew Center of the States (2011) reached a conclusion showing that older persons have comparable, if not lower, rates of recidivism and pose a low risk to public safety.

Overall, many issues remain regarding the involvement of individuals with dementia within the justice continuum. Most notable are the inability to distinguish symptoms of dementia from other psychological or behavioral disorders, ability to provide adequate care coordination, low frequency of screening of individuals with dementia creating data gaps, stigmatization of formerly incarcerated individuals and concerns in the lack of, or existing quality in the ability to retain information from, training uniquely designed for individuals who provide direct oversight of incarcerated individuals with dementia. These issues present gaps, which further impact the ability to research and triage individuals within dementia in correction settings. Despite gaps, research related to restorative measures with dementia patients provides a positive perspective on the ability to restore competency in some individuals with dementia. Finally, the recent creation of memory units dedicated to incarcerated individuals with dementia shows progress in the much-needed creation of specialized models of care within correctional health

Limitations

The sensitivity of the MoCA is often considered a strength; however, Hanna-Pladdy *et al.* (2010) found that the MoCA may overclassify individuals with Parkinson's disease as impaired. A potential remedy would be the use of the MoCA as an initial screening tool with the assumption that individuals with suboptimal scores be automatically referred for further testing and evaluation. At this time, it may be appropriate to administer comprehensive neuropsychological evaluation to assess the psychological state and cognitive functioning of an individual. The development of a cognitive screening tool specific to the correctional population may be necessary to address previous concerns addressed by correctional health researchers, including inability to sometimes complete tests or preference for using the MMSE. Additional studies assessing the reliability and construct validity of the SF-MoCA may be necessary to ensure the tool presents a suitable alternative to the original MoCA.

Discussion

The increasing number of aging individuals within the correctional system combined with the lack of knowledge surrounding the prevalence of incarcerated individuals with dementia highlights the need for more research regarding this special population, and widespread training of justice partners on the identification and care of individuals with dementia (Williams *et al.*, 2012). The neurodegenerative nature of dementia combined with the notion that correctional settings already accelerate the aging process shows a clear need to minimize justice contact for individuals with dementia (Enggist *et al.*, 2020; Munday *et al.*, 2014; Purewal, 2020; Sefra *et al.*, 2014). From a systems perspective, policy and programs that divert individuals with dementia from correctional settings and into non-correctional facility settings where they can receive the most appropriate level of care is needed. Existing policies that restrict the placement of justice-involved individuals with dementia in community settings should be reexamined, especially if the individual with dementia does not create a concern for the safety of themselves or others (Moll, 2013). Training centered around the identification of dementia-related symptoms should be provided to law enforcement officers and first responders, so they know when to coordinate with community health professionals for assessment and care of individuals with dementia (Williams *et al.*, 2012).

Should diversion not be possible, timely cognitive screening is necessary to better understand the potentiality for cognitive impairment or dementia in individuals aged 55 or older as part of their initial intake assessment (Sefra *et al.*, 2014). Intake personnel should be trained and given resources (e.g. empowerment to recommend further cognitive evaluation based on low screening scores and/or appropriate risk factors) that support effective screening practices in correctional settings. In this paper, we discussed the potential use of the MoCA as a cognitive screening tool that has been validated using correctional samples (Ahalt *et al.*, 2018). In addition to initial cognitive screening at intake, individuals aged 55 or older should be screened before leaving the correctional setting and reentering into the community. Screening before community reentry provides an opportunity to examine potential cognitive issues that may impact the resettlement process, and coordinate care and treatment with community providers using referrals (Moll, 2013; Williams *et al.*, 2012).

Individuals with dementia may exhibit antisocial or aggressive behaviors as a natural part of the disease progression. Without knowledge that an individual is living with or developing dementia, aggressive or noncompliant (e.g. inability to comply due to disorientation, forgetfulness, etc.) behaviors may result in disciplinary action, isolation or victimization within the correctional setting. To better cater to the unique needs of individuals with dementia, funding should be made available that encourage the construction or designation of specialized long-term care units especially designed for individuals with dementia. These facilities should be designed with dementia-friendly environmental component (e.g. lower bunks to reduce falls, clear signage to aid lost individuals, etc.) and employ staff trained in the unique needs of older adults (Williams *et al.*, 2012).

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