

The impact of dementia in the prison setting: A systematic review

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Abstract

Older prisoners are the fastest growing group in the prison population, with an accelerated aging process they are at a high risk of developing dementia. However, no systematic review has explored the impact of dementia in the prison setting. The objectives of this review were to identify the prevalence of dementia in the prison setting and how prison, health and social care providers assess, diagnose, treat, support and care for prisoners with dementia. A systematic search of the literature from the following databases was undertaken: CINHAL, PubMed, BNI, PsychINFO, and MEDLINE. Search strategies were tailored for each database and included recognised Medical Subject Headings. Hand searching of prominent journals in correctional services and dementia, as well as reference lists of included papers was completed. Open Grey website was searched to identify relevant government, local council and charity publications regarding dementia in the prison setting. The appropriate Critical Appraisal Skills Programmes Checklist for all included studies was completed. Following the application of inclusion and exclusion criteria 10 studies were included in the review. Due to the nature of the data extracted a meta-synthesis was not possible, therefore a thematic synthesis was completed. Three themes emerged: prevalence of dementia in the prison population, identification of older prisoner's needs, and knowledge of correctional officers and legal professionals. The prevalence and incidence of dementia in prison populations remains largely unknown. There is a need for national policies and local strategies that support a multi-disciplinary approach to early detection, screening and diagnosis of cognitive impairment and dementia across prison settings. Alongside the development of structured prison environments, non-pharmacological

interventions, continued assessment of prisoners with a dynamic care plan, and training for health, social and prison staff and prisoners.

Introduction

The world's population is aging, which impacts on many aspects of society, one of which is custodial services. Older prisoners are the fastest growing group in the prison population, in England and Wales the number of prisoners aged 50-59 increased by 100% and those over 60 by 120% from 2003 to 2013, and this trend is predicted to continue (House of Commons Justice Committee, 2013). In the United States of America (USA) the population of older prisoners, defined as those over the age of 55 increased by 79% from 2000 to 2009 (Beck and Harrison, 2001; West, Sabol and Greenmans, 2010). Similar increases have been observed in Australia as prisoners over the age of 50 rose from 8.3% to 11.2% of the prison population from 2000 to 2010, and in 2017 prisoners over the age of 50 accounted for 12.9% of prison population (Australian Bureau of Statistics [ABS], 2000; ABS, 2010; ABS, 2017).

Many factors have contributed to the increase of older prisoners, in the UK, Australia and USA the implementation of custodial sentences to discourage crime has resulted in longer sentences with no fixed release dates (Baidawi, Turner, Trother, Browning, Collier, O'Connor et al. 2011; Moll, 2013). In the UK custodial sentences for breaches of bail have been enforced (Ministry of Justice, 2010).

Furthermore, convictions for sexual offences are more prevalent in older prisoners and advances in forensic evidence have enabled historic offences to be brought to trial (Yorston, 2015; Resettlement and Care for Older Ex-Offenders and Prisoners [RECOOP], 2015). Mandatory minimum sentencing and reduced options for early release are also cited as reasons for an ageing prison population (Baidawi et al. 2011).

The increase of older prisoners has a significant impact on custodial, health and social care services (Williams, Stern, Mellow, Safer and Greifinger, 2012b). Custodial routines have been developed to support the rehabilitation of younger offenders, and therefore may not support older prisoners with

increased physical and mental health needs (Angus, 2015). Prisoners are also acknowledged to have an accelerated aging process, which has been defined by Grant (1999) as a 10 year differential, that is a prisoner's physiological health is 10 years advanced of their chronological age. In the UK the prevalence of chronic illness in prisoners aged 50-54 has been estimated to be 71% and those 70 and over 92% (Hayes, Burns, Turnbull and Shaw, 2012). Elements that contribute to prisoners accelerated aging include poor health and life style choices, which commence prior to and during a prison sentence (Maschi, Kwak, Ko and Morrissey, 2012; Williams et al. 2012b).

The definition of an 'older prisoner' has yet to receive consensus, with a current range of 45 – 65 years. However, many reports, policies, and governing bodies recognise the definition of an older prisoner as any offender over the age of 50 (Prison Reform Trust, 2010; Public Health England, 2017; Angus, 2015). In addition Indigenous people from Australia and USA have been recognised and classified as older prisoners at a younger age (Baidawi et al. 2011). Therefore, a definition of an older prisoner is essential as the accelerated aging of prisoners impacts on their likelihood to develop chronic illnesses and/or disabilities often before the age of 50 (Williams, Goodwin, Baillargeon, Ahalt, and Walter, 2012a).

A syndrome related to aging, but not a natural part of aging, is that of dementia. The risk of dementia doubles every five years from the age of 65 in the general population (Corrada, Brookmeyer, Paganini-Hill, Berlau and Kawas, 2010). The risk of dementia within the prisoner population may be higher due to accelerated aging and the risk factors associated with this, and further risk factors such as: low educational attainment, higher rates of psychiatric morbidities and traumatic brain injuries (Maschi et al. 2012; Williams et al. 2012b).

Aging prisoners may have an increased risk of developing dementia, yet there remains a lack of information on the prevalence of dementia in prison settings. In the USA the prevalence of dementia has been estimated at a prison level, and ranges from 1% to 44%, with the highest percentage in a prison specifically for older prisoners (Maschi et al. 2012). There is limited information available for

Australia or the UK (Patterson, Newman and Doona, 2016). Information is available on the physical and mental health diagnoses of older prisoners, with comparisons to younger prisoners and to the general public, but without including or specifically identifying dementia (Loeb and AbudDagga, 2006; Binswanger, Krueger and Steiner, 2009; Davoren, Fitzpatrick, Caddow, Caddow, O'Neill and Kennedy, 2015). A recent review of the prevalence of psychiatric disorders among older prisoners reported the prevalence of dementia as 3.3% and cognitive impairment as 11.8% (Di Lorito, Vollm and Dening, 2018). However, this may not be a true representative as only seven of the nine studies specifically included the diagnosis of dementia.

The need to understand the prevalence of dementia in the prison population is essential to enable the support of the prisoner with dementia, prison staff and the prison service. The onset of cognitive impairment or dementia may leave a prisoner vulnerable. The importance of identifying vulnerable prisoners is to prevent victimization from fellow prisoners and unwarranted disciplinary actions (Williams et al. 2012b; Feckzo, 2014). For prisoners with dementia disciplinary actions may occur as a consequence of their behaviour that is beyond their control, and/or being unable to adhere to the prison routine.

The impact of dementia in the prison population remains largely unexplained and unexplored. Health and social care provision have focused on mental and physical health of prisoners. For example correctional staff have received training to enable them to support prisoners with a serious mental illness (Dvoskin and Spiers, 2004), and primary care teams have been implemented to support prisoners physical health (Wong, Wright, Santomauro, How, Leary and Harris 2018). However neither of these initiatives have a specific focus or agenda with regards to dementia (Steadman, Osher, Robbins, Case and Samuels, 2009; Trestman, Ford, Zhang and Wiesbrock, 2007; Fazel, Hope, O'Donnell and Jacoby, 2004). Further understanding of the impact of dementia within the custodial setting is required to support prisoners with dementia, health and social care staff, as well as prison staff and the prison regime (Wilson and Barboza, 2010).

The aim of this systematic literature review is to identify: the prevalence of dementia in the prison setting, and how prison, health and social care providers assess; diagnose; treat; support and care for prisoners with dementia.

Methods

Search Strategy

The following electronic databases were searched from inception to December 2017: CINAHL, PubMed, BNI, PsychINFO, and EMBASE. Search strategies were tailored for each database and included recognised Medical Subject Headings (MeSH), refer to Table 1.

The review process included: hand search of a number of prominent journals in correctional services and dementia; search of the Open Grey website to identify grey literature such as: government local council and charity initiatives within dementia and the prison setting. Finally, screening of reference lists of identified papers was completed.

INSERT TABLE 1 HERE

Inclusion and Exclusion Criteria

Inclusion criteria were: studies presenting primary data related to prisoners with cognitive impairment or dementia in the prison or custodial setting, published in peer reviewed journals from inception to 31st December 2017 in the English Language. Studies with a focus on older prisoners and/or psychiatric morbidities that provided specific information regarding prisoners with cognitive impairment or dementia were also included.

Exclusion criteria were: studies reporting psychiatric morbidities without specifically identifying dementia, opinion and discursive papers, and grey literature describing programmes implemented in custodial services to support prisoners with dementia with an absence of primary outcome data.

Studies exploring cognitive disabilities rather than cognitive impairment were excluded as related to other conditions such as autism, Downs Syndrome or traumatic brain injury.

Study Selection

The screening process was completed independently by two reviewers JB and AG. All duplicates were removed prior to the commencement of this process. Discussion and agreement of inclusion and exclusion criteria occurred prior to the screening of titles and abstracts to appease disagreements. In the event of a disagreement that could not be negotiated the third author was consulted.

Quality Assessment

A number of quality assessment tools were applied to appraise included studies due to their different methodological approaches. These included: Joanna Briggs Institute Critical Appraisal Checklist for case control studies (Moola, Munn, Tufanaru, Aromataris, Sears, Sfetcu et al. 2017), Critical Appraisal Skills Programme (CASP) checklist for cohort studies (CASP, 2018), CASP checklist for qualitative studies (CASP, 2018), a critical cross-sectional appraisal tool (Downes, Brennan, Williams and Dena, 2016), and a mixed methods appraisal tool (Pluye, Robert, Cargo, Bartlett, O’Cathain, Griffiths et al. 2011). Only minor elements were identified, the checklists are provided within the additional online information.

Data Extraction

Data extraction was completed by JB and checked by AG, and included publication, aim, setting, methods, participants, results and an overview of the discussion.

Data Synthesis

Data from all included studies were extracted to identify key issues and themes through synthesising and interpreting the results. Due to the nature of the data extracted and the different paradigms, designs and methods of each study, a meta-analysis was not possible. Therefore, a thematic synthesis was completed as described by Thomas and Harden (2008). The three stage approach of meta-synthesis was adhered to, which included coding of the text, the development of descriptive

themes which reflected the primary data, and an interpretative phase of the development of analytical themes. The process was completed by JB and discussed and developed with AG and DJ.

Findings

Study selection

The inclusion and exclusion criteria were applied to screen and identify relevant papers, the results are summarised in a Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) diagram (Moher, Liberati, Tetzlaff and Altman, 2009). A number of papers were excluded following; screening of titles (n=1518), reading of abstracts (n=251), and finally full papers were obtained (n=68), of which 10 met the inclusion and exclusion criteria (refer to Diagram 1). One paper was published online in 2017, and then within an issue of the journal in 2018 (Combalbert, Pennequin, Ferrand, Armand, Anselme and Geffray, 2018) and is therefore included within this review.

INSERT DIAGRAM 1 HERE

Study Characteristics

An overview of the characteristics of the included studies are provided in Table 2, studies were completed in; USA (n=3), UK (n=3), Australia (n=2), France (n=1), and Sweden (n=1). Studies explored different aspects of dementia in the prison setting, which included: prevalence of older prisoners with cognitive impairment or dementia (n=2), psychiatric diagnosis (n=1), correctional officers knowledge (n=1), identification of the needs of prisoners with cognitive impairment or dementia (n=4), legal professionals knowledge (n=1), and comparison of physical and mental health of older male prisoners to community dwelling men (n=1).

INSERT TABLE 2 HERE

Study Designs

Study designs varied due to the exploration of different aspects of dementia in the prison setting, which included: cross-sectional semi-structured interviews with validated questionnaires (Fazel, Hope, O'Donnell and Jacoby, 2001; Kingston, Mesurier, Yorston, Wardle and Heath, 2011; Shepherd, Ogloff, Shea, Pfeifer and Paradies, 2017; Combalbert et al. 2018), case note evaluations (Fazel and Grann, 2002; Hayes et al. 2012), case note evaluations and validated questionnaires (Williams, Lindquist, Hill, Baillargeon, Mellow, Greifinger et al. 2009), and round table and Delphi design (Williams et al. 2012a; Patterson et al. 2016). One study applied mixed methods including validated questionnaires and qualitative interviews (Soones, Ahalt, Garrigues, Faigman and Williams, 2014).

Validated questionnaires

Studies applied validated questionnaires to address the aim of their research, these included: Geriatric Mental State examination (Fazel et al. 2001; Kingston et al. 2011); Structured Clinical Interview for DSMIV Axis II personality disorders (Fazel et al. 2001; Hayes et al. 2012); Mini- Mental State Examination (Kingston et al. 2011; Hayes et al. 2012; Combalbert et al. 2018); Camberwell Assessment of Need-Forensic Short Version (Hayes et al. 2012; Shepherd et al. 2017). Further validated questionnaires included: Geriatric Attitudes Scale (Soones et al. 2014); Kimberly Indigenous Cognitive Assessment Tool (Shepherd et al. 2017) and Combalbert et al. (2018) included the: Frontal Assessment Battery; Nottingham Health Profile; World Health Organisation Quality of Life Questionnaire and the Scale of Subjective State of Mental Health. The diversity of questionnaires implemented across studies included in this review identifies the current diverse approach to exploring the impact of dementia in the prison population.

Participants

The number of participants within studies ranged from: prisoners 121 – 262, (n=1,056) of whom the majority were male, nurses and healthcare professionals 18-36, (n=83), correctional officers (n=71), legal representatives and advocates (n=72), and a comparison with community dwelling males (n=138).

Operationalisation of age

The operationalisation of older prisoners varied across studies, ranging from prisoners over the age of 50 (Kingston et al. 2011; Hayes et al. 2012; Combalbert et al. 2018) and over the age of 60 (Fazel et al. 2001; Fazel and Grann, 2002). One study exploring prison healthcare professionals understanding of the needs of older prisoners discussed how to define the older prisoner, with the agreement of 55 years or older. However, healthcare professionals also acknowledged services should be inclusive for all with cognitive or functional impairments, regardless of age (Williams et al. 2012a). This was supported by one study which did not refer to age but a diagnosis of dementia or cognitive impairment (Shepherd et al. 2017).

Themes

Three themes emerged from the analysis: 1) Prevalence of dementia in prison populations; 2) Identification of older prisoners' needs; 3) Knowledge of correctional officers and legal professionals.

Prevalence of dementia in prison populations

The prevalence of dementia in prison populations ranged from 0.8– 18.8% (Fazel et al. 2001; Shepherd et al. 2017; Kingston et al. 2011; Combalbert et al. 2018), refer to Diagram 2. The difference in identified prevalence of dementia between studies may be due to the different prison populations. Kingston et al. (2011), Fazel et al. (2001) and Combalbert et al. (2018) included the population of four and 15 prisons in England and Wales, and prisons across France respectively. Shepherd et al. (2017) included adult Aboriginal and/or Torres Strait Islander males and females in regional and metropolitan prisons in Australia, with a mean age of 34.4.

INSERT DIAGRAM 2 HERE

A further explanation of the difference in the prevalence of dementia across prisons may be the screening and diagnostic tools implemented. Earlier studies of Fazel et al. (2001) and Fazel and

Grann (2002) applied standardised instruments for identifying psychiatric and personality disorders including the Geriatric Mental State [GMS] (Copeland, Dewey, Henderson, Kay, Neal, Harrison et al. 1988) and the DSM-IV. Whereas, more recent studies applied a specific screening tools to identify cognitive impairment (Kingston et al. 2011; Combalbert et al. 2018), which was the Mini Mental State Examination [MMSE] (Folstein, Folstein and McHugh, 1975). Shepherd et al. (2017) also applied a more culturally appropriate screening tool for the Aboriginal people, the Kimberley Indigenous Cognitive Assessment Tool [KICA] (LoGiudice, Smith, Thomas, Lautenschlager, Almeida, Atkinson et al. 2006).

Kingston et al. (2011) found a disparity between those diagnosed with dementia (2%) and those with suggested cognitive impairment following cognitive screening with the MMSE (12.8%). This is comparable with the findings of Combalbert et al. (2018), which following cognitive screening with the MMSE found 18.8% of prisoners had scores suggestive of dementia. However, the differences between these two studies may be the interpretation of the MMSE results. Combalbert et al. (2018) identified cognitive impairment suggestive of dementia in prisoners scoring less than 23 on the MMSE, whilst Kingston et al. (2011) divided prisoners into those scoring 10-19 (0.8%) and 20-26 (12%). Combalbert et al. (2018) was the only study to apply the Frontal Assessment Battery [FAB] (Dubois, Slachevsky, Lituan and Pillon, 2000), and compare older prisoners with older community dwelling men. The FAB is a quick evaluation of executive functioning, with a score of 16 or less suggesting a pathological impairment. Combalbert et al. (2018) found 89% of prisoners scored 16 or less on the FAB, compared to 50% of community dwelling men.

The more recent studies have highlighted the need to apply specific cognitive screening tools to accurately identify the prevalence and incidence of cognitive impairment and dementia in prisons. The prevalence of dementia in the prison setting may range from 12.8 to 18.8%, which is higher than community settings (Kingston et al. 2011; Combalbert et al. 2018).

Identification of older prisoner's needs

The consideration of older prisoners' needs and how to improve the quality of care for prisoners with dementia was explored by experts in prison healthcare (Williams et al. 2012a; Patterson et al. 2016). Older prisoner's needs and unmet needs were also identified through interviews and case note reviews, as well as the application of validated cognitive and forensic need assessments (Hayes et al. 2012; Shepherd et al. 2017).

Experts in prison healthcare identified the need for a list of functional requirements to support older prisoners to maintain independent living, and a framework to support staff to care for and manage older prisoners and those with dementia (Williams et al. 2012a, Patterson et al. 2017). Both studies identified specific needs with regard to prisoners with dementia which included: the development of appropriate accommodation, a multi-disciplinary team approach, alongside specialist care and environments. However experts also recognised the need to acknowledge the financial restraints of prison services (Williams et al. 2012a; Patterson et al. 2017).

Health professionals expressed the need to identify prisoners with cognitive impairment and the importance of developing cognitive screening tools as current tools were considered unsuitable, and were unlikely to identify new prisoners with dementia. Healthcare professionals also recognised the need for cognitive screening to be embedded in a framework to support referral processes in a transparent and consistent manner which was currently lacking (Patterson et al. 2016).

The needs of older prisoners and Aboriginal prisoners have been explored through the application of the Camberwell Assessment of Needs Forensic Short Version [CANFOR-S] (Thomas, Harty, Parrott, McCrone, Slade and Thornicroft, 2003) (Hayes et al. 2012; Shepherd et al. 2017). Older prisoners needs were explored in 5 year age bands from 50-70+, and Aboriginal prisoners with and without cognitive impairment to identify total need, met need or unmet need. There was no overall significant difference in the total need of older prisoners, but there was a decreased need in daytime activities for prisoners aged 65-69, and an increased need in psychological support for prisoners aged 50-54 (Hayes et al. 2012). Aboriginal prisoners with cognitive impairment had an increased

unmet need of culturally appropriate daytime activities, an increased experience of racism and difficulties around non-Aboriginal people (Shepherd et al. 2017). Both studies found reduced access to telephones for older prisoners and those with cognitive impairment (Hayes et al. 2012; Shepherd et al. 2017).

Studies identified the need to develop strategies within a cohesive framework to enable the identification, assessment and support of older prisoners and those with cognitive impairment (Williams et al. 2012a; Patterson et al. 2016). Essential elements of a cohesive framework would include the development of an appropriate cognitive screening tool, a multi-disciplinary approach and services specifically for older prisoners and those with dementia. However, this needs to occur alongside an equitable approach to support older prisoners and those with dementia to access generic services for all prisoners.

Knowledge of correctional officers and legal professionals

Correctional officer's identification of prisoners with disabilities was correlated with information recorded within California Department of Corrections Rehabilitation (CDCR) case notes (Williams et al. 2009). There was no significant difference between the number of prisoners diagnosed with dementia who were known (n=2) and unknown (n=3) to their assigned officer. Prisoners identified by officers to have disabilities tended to be older, hospitalised in the last two years, and have a hearing impairment. Disparities occurred in both directions, as CDCR identified specific cases of offenders with dementia unknown by assigned officers, and assigned officers reported higher rates of disability than acknowledged in CDCR reports.

Legal professional's expertise and aging-related training was explored through a questionnaire and in-depth interviews (Soones et al. 2014). Only 29% of the legal professionals had completed any aging-related training, 67% stated the need and importance of receiving some or more training, whilst 46% held the view 'as people grow older, they become less organised and more confused'.

Legal professionals' also identified a lack of knowledge on how to identify and respond to cognitive

impairment, safety risks and referral processes, especially when a surrogate decision-maker was required, and how to optimise services for older offenders and those with cognitive impairment (Soones et al. 2014).

Studies identified the need for robust training programs to improve correctional officers and legal professional's knowledge of the aging process, cognitive impairment and disabilities related to aging. The development of a comprehensive standardized checklist was also recommended to support the identification of cognitive impairment, disabilities and issues relating to offenders safety and declining health (Williams et al. 2009; Soones et al. 2014).

Discussion

Three broad themes were identified in this review and represent the current initiatives and focus to understand the impact of dementia in the prison setting, which include the prevalence of dementia, identification of older prisoner's needs and knowledge of correctional officers and legal professionals.

The prevalence of cognitive impairment and dementia in prison populations remains unclear, due to the likelihood of underreporting and a prison regime, which may prevent identification of cognitive impairment or the early stages of dementia (Sterns, Lax, Sed, Keohane and Sterns, 2008). However, more recently studies have explored cognitive impairment through the use of validated cognitive screening tools. However, the applicability and validity of these tools for prison populations is questionable.

The MMSE was frequently applied in the studies in this review. However, the first five questions on the MMSE assess orientation to time, and many prisoners without cognitive impairment become disorientated in the prison setting due to environmental factors (Grassian, 2008). The reliability and validity of the MMSE for prisoners has not been explored and data remains lacking to support the use of this tool with prisoners (Williams et al. 2012b). This review highlights issues of sensitivity and

specificity of the use of the MMSE within the prison setting, as Hayes et al. (2012) found no difference in MMSE scores amongst prisoners aged 50 to over 70, which seems an unlikely finding.

The need for an optimum cognitive screening tool was identified by health care professionals; as was the need to screen all prisoners on admission, and annually for older prisoner's (Williams et al. 2012b). A screening tool to assess prison activities of daily living (PADLs) has been developed and includes five actions: dropping to the floor for alarms, standing for head counts, ambulating to the dinner hall for meals, hearing orders from staff, and climbing up and down from the top bunk (Williams et al. 2009). However, this instrument is based on an American prison setting and has not been further validated or tested for sensitivity or specificity with regards to identifying cognitive impairment.

The need for an optimum screening tool remains as healthcare professional's find current tools unsuitable and unlikely to identify new cases of dementia in prisoners (Williams et al. 2012a; Patterson et al. 2016). The consensus among healthcare professionals was a simple memory test, such as remembering three words and a cognition test, such as drawing a clock face. If a prisoner failed either or both of these tests, further cognitive screening would be undertaken (Patterson et al. 2016).

The identification of the needs of older prisoners has been a priority in England and Wales within two reports released by the HM Chief Inspectors of Prisons (2004; 2013). Older prisoners were perceived by staff as: 'old and quiet', more compliant than younger prisoners and posed no threat to the prison regime, which led to a lack of assessment and identification of older prisoner's needs. Recommendations from the HM Chief Inspectors included identification of older prisoner's healthcare, social care and prison needs, alongside the development of a national strategy for older prisoners by Her Majesty's Prison and Probation Service (HMPPS). The need remains for national strategies and local frameworks, which clearly define the responsibilities of all services involved in a

transparent process of assessment, identification, and implementation of care and support for older prisoners.

In the UK the Prison and Probation Ombudsman report (2017) identified the need for a specific focus on dementia and complex needs, as identified 4% of the deaths investigated included a prisoner with a diagnosis of dementia. Recommendations included the need for a multidisciplinary approach to support the physical and mental health of prisoners with dementia with skilled staff to complete risk assessments, a coordinated approach to care and the sharing of information.

In England and Wales Prison service there remains no national strategy regarding dementia (House of Commons, 2017). In the USA strategies to support prisoners with cognitive impairment and dementia have begun to be developed and include early, diagnosis, structured environment, training of staff, and non-pharmacological interventions (Wilson and Barboza, 2010).

The development of frameworks to support policy and prison reforms to address the needs of prisoners with cognitive impairment and dementia needs to include the training of prison staff and legal professionals. In the USA, Alzheimer's Association has designed and implemented dementia awareness training specifically for prison officers. Whereas in the UK Alzheimer's Society has implemented dementia awareness training for both prison officers and prisoners (Moll, 2013). However, the extent of such training initiatives and the impact has yet to be robustly evaluated.

Training initiatives for prisoners have included how to provide social care, this approach enables prisoners to support aging fellow prisoners with complex needs (Stewart, 2018). Training initiatives for prisoners include: listeners, who are prisoners trained by the Samaritans to support fellow prisoners experiencing distress; insiders, who are prisoners who support new prisoners and provide practice advice, information and reassurance; and hospice volunteers, who are prisoners trained to provide practical support, social and companionship to those who are terminally ill (South, Bagnall and Woodall, 2017). Training initiatives for prisoners have been found to support the peer caregivers, those receiving their care and the prison regime (Wilson and Leob, 2016). Currently,

these initiatives have not included training or specific information on how to support a prisoner with dementia.

A number of initiatives to support prisoners with dementia have begun to be implemented. The Special Needs Program for Inmates with Dementia in California Men's Colony state prison, which includes the training of prison officers and nursing staff, alongside prisoners to support prisoners with dementia (Hodel and Sanchez, 2012). The Buddy Model is another initiative that has been implemented across prisons in South West England by Devon County Council (2014). Prisoners are recruited and trained in assisting other prisoners with social care needs and non-intimate personal care. An element of the buddy training involves cognitive impairment and dementia. However, both of these initiatives have yet to have robust evaluations completed or published.

The limitations of this review need to be acknowledged. We included research conducted in English, and so insights and information reported in languages other than English are not captured in this review. A large amount of grey literature was identified that has not been comprehensively reported in this review.

Conclusion

The aging prison population presents challenges to the prison services, as well as health and social care personnel. Growing numbers of older prisoners increases the likelihood of cognitive impairment, dementia and dementia-related conditions. There is an urgent need to develop and implement programs for screening, regular assessment and health preserving activities for people with dementia in the prison environment. This will only be effective if prison, health and social care staff are equipped with the skills necessary to recognise cognitive impairment and work collaborative within the multi-disciplinary team..

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Declaration of conflicting interests

The Authors declare that there is not conflict of interest.

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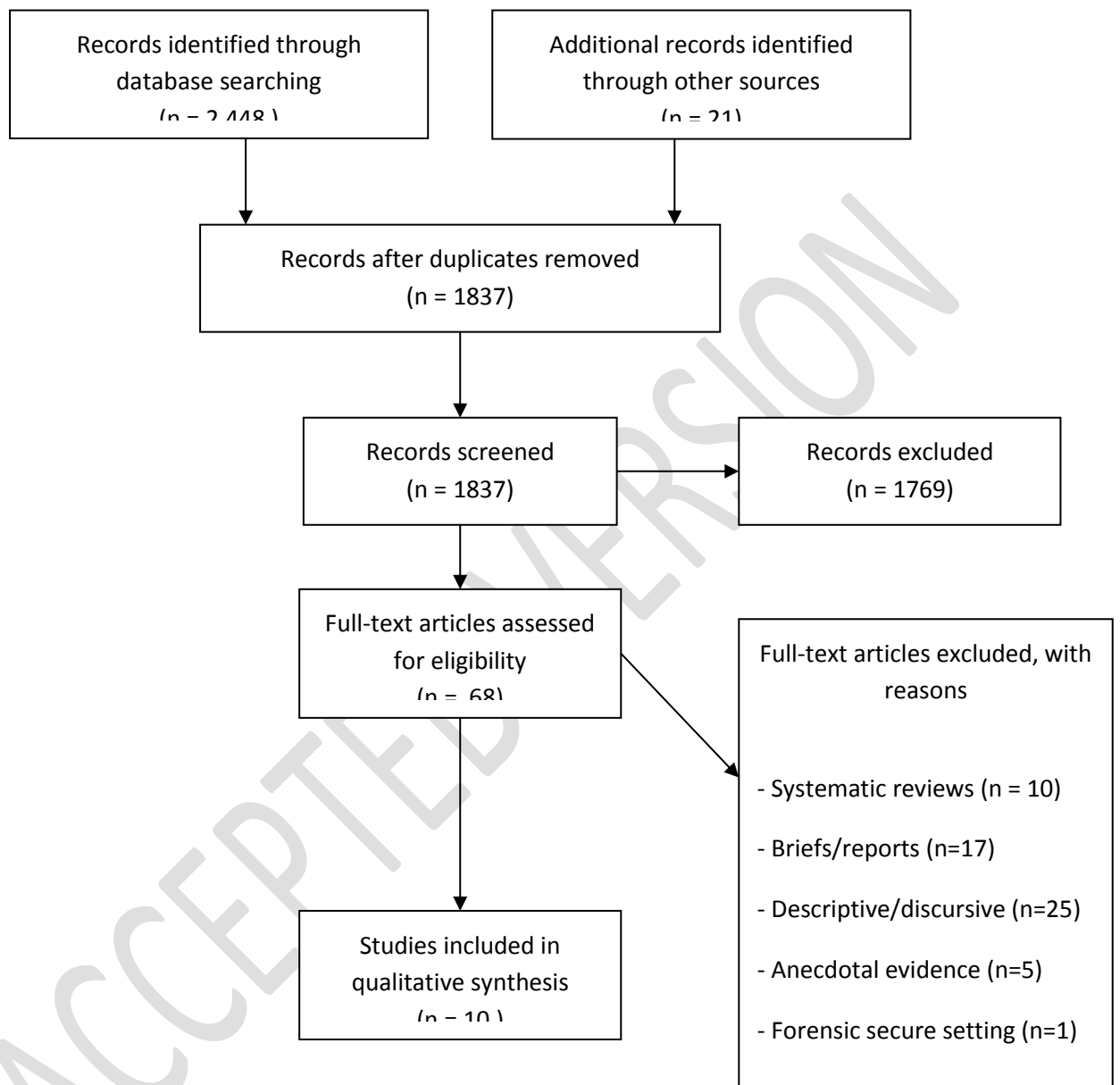
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Table 1: Search terms, data bases and number of hits

Search strategy	CINAHL	PsychINFO	PubMed	BNI	MEDLINE
Offenders 'or' criminals 'or' prisoner 'or' inmate 'and' dementia 'or' alzheimers 'or' vascular dementia 'or' lewy body 'or' frontotemporal 'or' cognitive impairment 'or' memory loss 'or' cognitive decline 'or' mild cognitive impairment	67	344	170	343	227
Custodial 'or' prisons 'or' forensic 'or' custodial health 'and' dementia 'or' alzheimers 'or' vascular dementia 'or' lewy body 'or' frontotemporal 'or' cognitive impairment 'or' memory loss 'or' cognitive decline 'or' mild cognitive impairment	27	132	63	643	432

Total hits: 2,448

Diagram 1: PRISMA flowchart



Adapted from Moher et al. (2009).

Table 2: Overview of included studies

Author Year Country	Aim Setting	Methods Participants	Results	Discussion
Fazel et al., 2001 UK	To determine the prevalence of psychiatric morbidity in elderly sentenced prisoners Prisons in England and Wales (n=15)	Semi-structured interviews: -Geriatric Mental State Examination (GMS exam) -The Structured Clinical Interview for DMS-IV Axis II personality disorders (SCID-II) Correlation with: -Medical records and reception health screen data were accessed Prisoners -Over the age of 60 (n=203) -Mean age 65.6 (SD 4.8)	GMS Exam supported by Automated Geriatric Examination for Computer Assisted Taxonomy (GMS-AGECAT): -Psychiatric illness (n=64, 31.5%) -Neuroses (n=52, 25.6%) -Major depressive episode (n=15, 7.4%) -Psychosis (n=10, 4.9%) -Substance misuse (n=10, 4.9%) -Dementia (n=2, 1%) SCID-II: - Personality disorder (n=61, 30%)	The prevalence of dementia was slightly lower than that of the community levels. The authors suggested those diagnosed with dementia were successfully diverted prior to sentencing and that people with dementia do not have the capacity to commit serious crimes for which imprisonment in the consequence.
Fazel and Grann, 2002	Exploration of psychiatric diagnoses of younger and older prisoners referred by	Evaluation of structured court-ordered forensic psychiatric evaluations Offenders who completed a	Psychiatric diagnoses in prisoners over the age of 60: -Psychotic illness (n=67, 32%) -Personality disorder (n=41, 20%)	Older compared to younger offenders referred for psychiatric assessment were more likely to be diagnosed with dementia or an affective psychosis and less likely to be diagnosed with a personality

Sweden	<p>courts for psychiatric assessment</p> <p>Swedish courts</p>	<p>forensic psychiatric evaluation between 1988 -2000</p> <p>Offenders (n=7297)</p> <p>-Under the age of 60 (n=7297)</p> <p>-Over the age of 60 (n=210)</p>	<p>-Substance abuse (n=31, 15%)</p> <p>-Depressive/anxiety disorder (n=16, 8%)</p> <p>-Dementia (n=15, 7%)</p> <p>Prisoners over the age of 60 deemed legally insane:</p> <p>-Other psychoses (n=42, 43%)</p> <p>-Dementia (n=12, 12%)</p> <p>-Schizophrenia (n=12, 12%)</p> <p>-Personality disorder (n=7, 7%)</p> <p>-Substance abuse (n=6, 6%)</p> <p>-Depressive/anxiety disorders (n=4, 4%)</p>	<p>disorder or schizophrenia.</p> <p>Dementia was virtually non-existent in offenders under the age of 60, but was a factor that significantly increased the likelihood of legal insanity by eight times among older prisoners.</p>
<p>Williams et al., 2009</p> <p>USA</p>	<p>To assess correctional officers' knowledge of health and disability of their assigned prisoners compared with prison reports</p>	<p>Cross-sectional study</p> <p>Correctional officer questionnaires</p> <p>-Identify assigned geriatric prisoners disability status and healthcare needs</p> <p>Review of reports from the California Department of Corrections and Rehabilitation</p>	<p>Unknown prisoners:</p> <p>-To assigned officer (n=211, 34.1%)</p> <p>-Over the age of 70 (n=20, 27%)</p> <p>-CDCR identified a 76 year old women with dementia unknown to prison officers</p> <p>-Prison officers identified an 80 year old man with cognitive impairment unknown to CDCR</p>	<p>Prison officers identified different prisoners with disabilities compared to CDCR reports.</p> <p>Recognition of geriatric disability in prison needs improvement and need to include training of correction officers in how to identify older prisoners with disability, as well as formal and informal communication between</p>

	California Department of Corrections and Rehabilitation	(CDCR) Correctional officers (n=71) assigned to geriatric prisoners (n=618) from CDCR prisons (n=11)	Known prisoners more likely to be: -Slightly older (p=0.05) -Hospitalised in last 2 years (p<0.01) -Have a hearing impairment (p=0.04)	prison officers and reported information.
Kingston et al 2011 United Kingdom	To determine the prevalence of psychiatric disorders, including dementia, in prisoners 50 years and over Four prisons: HMP: -Dovegate -Featherstone -Shrewsbury -Stafford	Assessment of prison records and interviews using: -Geriatric Mental State Examination (GMS Exam) -Mini-Mental State Examination -Short Form 12 Prisoners approached (n=237) Prisoners who agreed to participate (n=121) Age of participants -50-59 (n=74) -60-69 (n=40)	GMS Exam supported by Automated Geriatric Examination for Computer Assisted Taxonomy (GMS-AGECAT): -Mental disorder (n=60, 50%) -Depressive disorder (n=50, 83%) -Dementia (n=2) MMSE: -Score in the 10-19 range (n=1, 0.8%) (demonstrating possible dementia) -Score in the 20-26 range (n=15, 12%) (demonstrating signs of cognitive impairment) Short Form 12 -Mental Health Scores (mean 47.5) -Physical Health Scores (mean 45.9)	Mental disorders in older prisoners are common, but despite recent training initiatives they often go undetected. Prisoners themselves accurately self-reported mental disorders, but the best way of detecting dementia in this population remains unclear. The psychological and physical health of this prison population was poorer than that of their community based peers.

		-70+ (n=7)		
Williams et al 2012a USA	To identify and propose a set of priorities to support the care of older prisoners USA correctional health experts	Round table meeting of 29 national experts in correctional health National experts -Chief medical officers (n=9) -Psychologists/psychiatrists (n=7) -Academic physicians (n=5) -Prisoner advocates (n=2) -Foundation officers (n=2) -Nurse (n=1) -Lawyer (n=3)	Consensus recommendations: -Define older prisoner -Train staff and health care providers -Define functional impairment -Screen for dementia -Identify needs of older women prisoners -Create policies for geriatric housing units -Identify release and re-entry challenges -Improve medical releases policies -Enhance prison palliative care programs	Importance of national and state policy makers to work with corrections and community organizations to understand the needs of older prisoners and the development of policies to support continuum of care within current services and budgets.
Hayes et al 2012 UK	To investigate the health needs of older prisoners, to compare needs within age groups and to identify a useful age cut-off for service planning	Cross-sectional study Interview case note review: -Burvill Grid for physical health -Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders IV (SCID-I) and personality disorders (SCID-II) -Mini-Mental State Examination	Physical health -90% of prisoners had a diagnosed long term health condition -Most common conditions were osteoarthritis and hypertension Mental Health -50-59 age group were more likely to have a mental illness (p<0.0001), mood disorder (p<0.0005), major depressive	Older prisoners had a high prevalence of physical and mental illness. Older prisoners physical and mental health needs are dominated by chronic conditions, unlike the majority of the prison population, who have acute disorders such as substance misuse and psychosis.

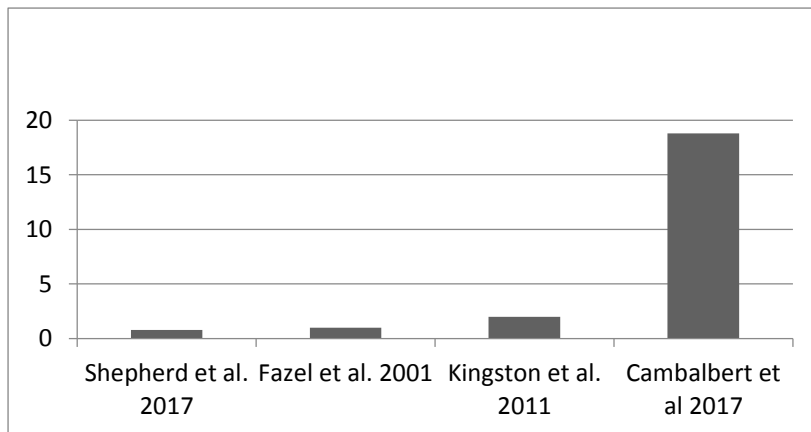
	North West Prison Service Area in the UK	(MMSE) -Camberwell Assessment of Need Forensic Short Version (CANFOR-S) Male participants (n=262): -aged 60 years and over (n=165) -aged 50 to 59 years (n=97)	disorder (p<0.01) Needs -No significant differences needs -Significant differences across age groups on 4 domains: daytime activities, food, support for psychological support, money and telephone access	The age of fifty appears to be a useful age to define 'older prisoners' and service provision should reflect this is in a national management strategy.
Soones et al 2014 USA	To assess the ability of legal professionals to respond to age-related conditions that could affect legal outcomes Criminal justice system in San Francisco County	Mixed methods Quantitative survey -Geriatric Attitudes Scale -knowledge of aging and aging-related health -professional training -Public defenders and legal advocates (n=42) -Lawyers (n=18) -Judges (n=4)	Geriatrics Attitude Scale -Positive attitudes towards older people (n=72, 100%) -Older people are: 'less organised and more confused' (46%) Knowledge of aging/aging-related health -Knowledgeable (n=10, 14%) -Lack of knowledge on how depression, dementia and delirium (n=39, 54%) -Received training (n=20, 29%) -Importance of training (n=46, 67%) Lack of knowledge and understanding of:	The need for education and training of legal professionals to include: aging-related health, simple cognitive assessments, how to identify those at risk of health decline or safety risk and referral processes for older adults returning to the community. These recommendations should support and reduce criminal justice and health care costs associated with older adults whose criminal behaviour is due to underlying cognitive impairment, as would support interventions for older prisoners, which may include alternatives to incarceration.

		<p>Qualitative interviews</p> <ul style="list-style-type: none"> -Attorneys (n=5) -Judges (n=2) -Social workers (n=3) 	<ul style="list-style-type: none"> - Aging and aging-related health -How to identify/respond to dementia -Safety risks and referral processes -Optimising services upon release 	
<p>Patterson et al., 2016</p> <p>Australia</p>	<p>To develop tools and procedures related to managing the care of, including the identification and assessment, of older persons with dementia who are imprisoned</p> <p>New South Wales, Australia</p>	<p>Modified approach of the Policy Delphi method, using both surveys and facilitated discussion groups</p> <p>Round 1 (online survey)</p> <ul style="list-style-type: none"> -Registered Nurses (n=36) <p>Rounds 2 -4 (discussion group)</p> <ul style="list-style-type: none"> -Registered nurses (n=5) -Nursing unit manager (n=2) -Nurse practitioner (n=2) -Clinical nurse consultant (n=2) -Clinical nurse educator (n=2) -Health service manager (n=2) -Geriatrician (n=1) 	<p>Round 1</p> <ul style="list-style-type: none"> -Cognitive screening tools were sometimes unsuitable (n=12, 42.9%) or very unsuitable (n=6, 21.4%) <p>Round 2</p> <ul style="list-style-type: none"> -The process for identifying older prisoners with dementia was agreed - Modifications needed to the current cognitive tool <p>Round 3</p> <ul style="list-style-type: none"> -Global Deterioration Scale with minor modification was agreed as an appropriate cognitive screening tool <p>Round 4</p>	<p>The outcome of the Policy Delphi method was a process for assessing older people with dementia in prison and an illustration of how the care of older people with dementia in prison can be managed.</p> <p>Recommendations included the training of staff in dementia care at both rural and remote correctional centres, the development of discharge planning/post release services and the need for collaborative working with community health and social care providers.</p>

		-Occupational therapist (n=2)	-Care of older persons with dementia through care planning by a locally based multidisciplinary team	
Shepherd et al., 2017 Australia	To identify Social and Emotional Wellbeing and unmet needs among cognitively and non-cognitively impaired Aboriginal people in custody Victorian regional and metropolitan prisons, Australia	Semi-structured interviews -Social and Emotional Wellbeing (SEWB) survey -Kimberley Indigenous Cognitive Assessment (KICA) -Camberwell Assessment of Need – Forensic Short Version (CANFOR SV) Aboriginal and/or Torres Strait Islander (n=122) Age: mean 34.4 (SD=10.3) Sex: male (n=107), female (n=15)	Cognitive impairment (KICA) -Only one participant received a low score suggesting a potential dementia SEWB Participants with cognitive impairment were more likely to have: -An illness/disability in the past 12 months (p<0.01) -Family member in prison (p<0.008) -Treated badly because of their indigenous heritage (p<0.06) CANFOR SV -Participants with cognitive impairment scored significantly lower on daytime activities and access to a telephone	Prisoners with cognitive impairment demonstrated poorer coping mechanisms, experienced more racism, and felt uncomfortable around non-Aboriginal people. The implication was a reduced access to culturally meaningful activities in custody. There is a need for culturally appropriate cognitive screening, on-going support and access in custody and on release, through collaboration and information sharing between health, correctional, employment, educational and disability services.
Combalbert et al	To explore cognitive	Semi-structured interview -Mini-Mental State Examination	Significantly different scores on the MMSE and FAB for prisoners compared	The MMSE and FAB demonstrated that cognitive impairment is more

<p>2017</p> <p>France</p>	<p>performance of older men in prison to community dwelling men, and the impact of cognitive decline on perceived health and quality of life</p> <p>Different types of penal institutions in France</p>	<p>(MMSE)</p> <ul style="list-style-type: none"> -Frontal Assessment Battery (FAB) -Nottingham Health Profile (NHP) -Scale of subjective state of mental health -World Health Organisation Quality of Life Questionnaire (WHO QoL) <p>Prisoners (n=138)</p> <p>Comparison men (n=138)</p> <p>Significant difference in age of participants ($p < 0.000$)</p> <ul style="list-style-type: none"> -Prisoners: mean 59.7 -Comparison men: mean 68.4 	<p>to comparison men ($p < 0.0001$)</p> <p>FAB</p> <ul style="list-style-type: none"> -Prisoners (n=106, 89%) scored equal to or less than 16 (impairment) compared to comparison men (n=53, 50%) <p>MMSE</p> <ul style="list-style-type: none"> -Prisoners (n=26, 18.8%) scored 23 or less (impairment) compared to comparison men (n=1, 0.72%) <p>Significant differences between physical and mental health and quality of life, prisoners reported more negative responses on each item and scale than comparison men</p> <p>Links between cognitive disorders and self-perceived health, and cognitive disorders and quality of life were weak</p>	<p>pronounced in older men in prison than in older men living in the community.</p> <p>Prisoners with low scores on the MMSE may struggle to adapt to a prison regime and building relationships with staff and fellow inmates.</p> <p>There is a need for prison staff to be sensitive to early cognitive decline, as this could be self-reinforcing as prisoners withdraw from social and rehabilitative aspects of their custodial sentence.</p>
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Diagram 2: Prevalence of dementia in prison populations



ACCEPTED VERSION